

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this study is to find out whether there is a difference between the way students of differing English proficiency levels but with similar levels of exposure to and attitudes towards the Internet perform in an information gathering activity via the Internet. This study also seeks to discover some of the possible factors which influenced their performance. As this area of research is still in its infancy, there was a lack of relevant previous research which could be referred to in the course of this study. Therefore, the research methodology employed in the study is essentially unique in that it was tailored specifically to gather data to answer the following research questions:

1. Do students of differing English proficiency levels perform differently in an Internet information gathering activity?
2. What are some of the possible factors that influenced their performance?

This chapter discusses the research design, the instruments used in the collection of data and a description of how the data collection was carried out. This chapter also provides an overview of the subjects and the rationale behind the selection of the subjects of the study.

3.2 Research Design

According to Yin (1994, p. 14), case studies contribute “uniquely to our knowledge of the individual, organizational, social, and political phenomena”. Case studies allow an investigation to “retain the holistic and meaningful characteristics of real-life events”. Yin further states that the need for case studies “arise out of the desire to understand complex social phenomena”. As such, case studies are increasingly being used as a research tool.

This study is essentially a 20-subject case study which focuses on the possible influence of English proficiency on the process of gathering information via the Internet. It is an in-depth investigation into the processes involved when these 20 subjects gather information from the Internet. As with other case studies, although this one focuses solely on a single group of subjects, the conclusions drawn may have widespread and long-range implications both within the college involved (Tunku Abdul Rahman College) and in terms of theoretical development in this relatively new field of research. Also, since an effective case study is one which seeks multiple sources of evidence, the data for this study was collected from three sources: a questionnaire, observation and retrospective interviews.

The research paradigm employed in this study is the qualitative paradigm. Creswell (1994, p. 2), defines the qualitative study as “an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants, and

conducted in a natural setting". According to Creswell, there are two distinct characteristics of a qualitative research problem:

- a) The concept is "immature" due to an obvious lack of theoretical background and previous research, and
- b) There is a need to further explore and describe the phenomena and to develop theory.

The nature of this study encompasses both the characteristics above as well as the complex process of gathering information via the Internet. Hence, the lack of previous research and theory in the area of Internet information gathering and the need to explore and possibly generate new theories on how individuals gather information via the Internet all contribute to the selection of the qualitative research paradigm.

The method employed in the collection of data was the observation technique. According to Babbie (1998), the word *observation* suggests a casual, passive activity. As such, researchers or scientists very often use the term *measurement* which means "careful, deliberate observations of the real world for the purpose of describing objects and events in terms of the attributes composing a variable". More than just a data-collecting activity, the observation technique is also a theory-generating activity. In other words, in many cases, there is no precisely defined hypothesis which is to be tested but rather, the researcher attempts to make sense of an ongoing process to generate conclusions. As such, the observation technique is very much inductive in nature. It is inductive in that the

researcher builds abstractions, concepts, hypotheses and theories from details (Creswell, 1994).

The observation method was therefore chosen as the central data collection method because this study is one which does not impose any theoretical perspectives on the actions or behaviour of the subjects. It takes an unobtrusive approach in that the researcher does not intrude on the information gathering process. This is carried out so that the true nature of the process would emerge and conclusions may be drawn based on what is observed.

An observation sheet was devised in order to facilitate the observation process (Refer to Appendix A).

3.2.1 Observation Sheet

According to Babbie (1998), recording observations can be made easier if standardized observation sheets are prepared in advance. An observation sheet is a prepared form in which actual observations can be recorded easily and efficiently.

The observation sheet for this study consists of 4 columns. The first column lists all the question numbers. The second one is for the researcher to insert a tick (if the subject answers correctly) or a cross (if the subject answers incorrectly). The third column is for the researcher to record the time taken for the subject to answer each question. And the final column is for the researcher to record other

relevant observations so that any unanticipated events or aspects of the situation can be recorded as they occur. A separate observation sheet was used for each subject.

Two instruments were applied in the collection of data for this study: an Internet treasure hunt and retrospective interviews.

3.2.2 Internet Treasure Hunt

An Internet treasure hunt (also known as a scavenger hunt) is an activity in which the subject has to work on a computer connected to the Internet to search for answers to a variety of questions by searching various websites (Brown, 1999). Internet treasure hunts allow students to practice their search skills (and their English skills) as they race to answer questions (Muchleisen, 1997). Apart from being an activity which students enjoy, Internet treasure hunts are “a way for students to practice problem solving, improve their reading and comprehension skills, and learn how to search the Internet” (Starr, 1999). Teachers can and do use this activity to teach academic concepts and navigation skills (Brown, 1999). An Internet search for Internet treasure hunts using the Google search engine revealed 102,000 related links. This shows how common this activity has become. Among the websites which feature Internet treasure hunts are the Internet TESL Journal (<http://www.aitech.ac.jp/~iteslj/th/>), Cyberbee (<http://www.cyberbee.com/hunts.html>) and Web Treasure Hunts (<http://www.ctnba.org/k8/treasure.html>). These sites and many others are dedicated to various

aspects of Internet treasure hunts, from how to create them to how to use them to teach various subjects, languages and skills.

Although people do not generally gather information via Internet treasure hunts, this activity was selected as an instrument because it has “quickly become one of the most popular tools for teaching students how to access and use the resources and information available on the Internet” (Starr, 1999). According to Starr (1999), there are four main reasons for the rapidly growing popularity of Internet treasure hunts:

- a) Internet treasure hunts are easy to create and result in interactive searches which are both fun and informative for students.
- b) Internet treasure hunts can be tailored to suit virtually any curriculum area, simultaneously providing students with technological and subject matter knowledge.
- c) Internet treasure hunts can be used as a means of providing students with a review of what has been taught or providing them with more challenging follow-up activities. The hunts can cater to a whole class, a small group or even individual students.
- d) Internet treasure hunts can have varying levels of difficulty to cater to the needs of the students or the demands of the subject matter.

Apart from all the reasons above, this online activity was selected as an instrument because the process of completing an Internet treasure hunt

is observable and the data collected is quantitative (number of correct answers and time taken) as well as qualitative (other observations such as clicking on irrelevant links).

The subjects were given a list of Internet addresses or Uniform Resource Locators (URLs) of various websites whereby each URL is followed by some questions prepared by the researcher. The subjects were required to type in the URL in order to go to the specific website where the answers may be found. The list of URLs and questions is as follows:

1. <http://www.theaustralian.news.com.au/>

- a. What is today's headline?
- b. What is the weather forecast for Sydney?

2. <http://www.xe.com/ucc/>

Use the currency converter to find the answers to these questions:

- a. What is one Australian dollar worth in American dollars?
- b. How many Canadian dollars is RM2 worth?

3. <http://www.actualidad.com/>

Find an English newspaper from your country.

- a. What is it called?

- b. What is the headline?

- 4. <http://www.guidedogs.com>
 - a. If you were a volunteer serving as a campus guide, what would your job description be?
 - b. If you were coming from the San Francisco International Airport, which highway do you have to take first to get to the California campus?

- 5. <http://www.shakespeare-online.com>
 - a. Name William Shakespeare's maternal grandfather.
 - b. Name William Shakespeare's eldest sister.
 - c. What did she die of?

The URLs and questions posed covered a broad spectrum of issues so as to avoid content bias. The issues or topics covered included newspaper headlines, the weather, currency, guide dog services and Shakespeare. The URLs were given to eliminate the need for a search engine and to streamline the process of searching for the answers. By providing the URLs, the subjects were brought directly to the desired website in which the answers could be found. This would ensure that none of the subjects got "lost" in cyberspace. The given URLs also helped to ensure that only one correct answer could be found for each question.

Since the purpose of this study is to see if there is a difference in the way students of differing levels of English proficiency levels gather information from the Internet, the questions were posed in increasing levels of difficulty. The levels of difficulty included semantic difficulty as well as the number of links the subject had to click on to arrive at the correct answers. This was done to ascertain if English proficiency levels play a part in the process of understanding and answering the questions.

For example, question 1a is “What is today’s headline?” In order to find the answer, all the subject has to do is understand what a headline is, type in the URL to arrive at the relevant website and copy the headline that appears there.

Question 4a is “If you were a volunteer serving as a campus guide, what would your job description be?” This question is semantically more difficult than question 1a because the subject has to understand the meaning of the terms *volunteer*, *campus guide* and *job description*.

The final question, question 5c is “What did she die of?” This question may appear straightforward and simple. However, in the website, the answer appears as “...*succumbed to the plague*...”. Therefore, in order to correctly answer this question, the subject must know what *succumbed* means and what *the plague* is. There are also no contextual clues to help the subject arrive at the correct answer.

The first website is <http://www.theaustralian.news.com.au/>. The two questions posed for this website are fairly direct:

- 1a. What is today's headline?
- 1b. What is the weather forecast for Sydney?

For question 1a, once the subject has typed in the given URL and logged on to the website, the answer will appear on the opening page. The answer is circled in Figure 3.1.



Figure 3.1 Image A of <http://www.theaustralian.news.com.au>

For question 1b, which is “What is the weather forecast for Sydney?” the subject has to scroll down to see and click on the “weather” link on the side menu bar to arrive at the answer. (see Figure 3.2)

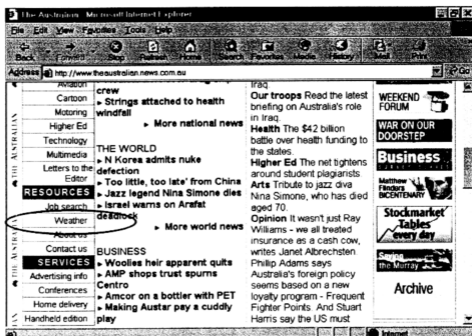


Figure 3.2 Image B of <http://www.theaustralian.news.com.au>

As such, the subject does not need a very high English proficiency level to answer the questions. In order to answer question 1b, the subject has to scroll down to find the “weather” link. This calls for slightly more navigational skills than required for question 1a. Nevertheless, both skills are very basic Internet navigation skills in that the subject only has type in the URL and navigate from one page to another by scrolling down and clicking on one link.

The second website is <http://www.xe.com/ucc/>. There are two questions posed for this website.

- 2a. What is one Australian dollar worth in American dollars?
- 2b. How many Canadian dollars is RM2 worth?

The subject need not click on any links to answer the questions. Upon keying in the given URL and arriving at the opening page of the website (see Figure 3.3), the subject has to key in the amount that is to be converted in the text entry box on the left, select the type of currency that is to be converted and the type of currency it is to be converted into. Then the subject has to click on the tab labeled “Click Here to Perform Currency Conversion”.

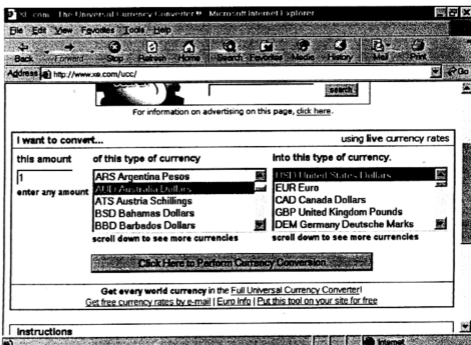


Figure 3.3 Image A of <http://www.xe.com>

Upon clicking on the tab, the computer will perform the calculations and the answer will appear as in Figure 3.4.

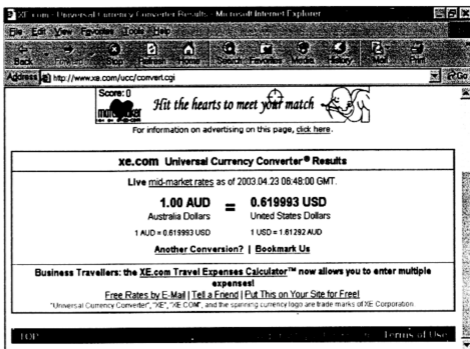


Figure 3.4 Image B of <http://www.xe.com>

Therefore, mathematical skills are not required. Again, only basic Internet skills are required to answer the questions. However, the questions are phrased in such a way that the subjects must understand what is required of them in order to obtain the correct answers.

Eg. 2a. What is one Australian dollar worth in American dollars?

2b. How many Canadian dollars is RM2 worth?

The second question is phrased in reverse order to the first one and the amount is also different.

The third website is <http://www.actualidad.com>. There are also two questions posed for this website:

3. Find an English newspaper from your country.
 - a. What is it called?
 - b. What is the headline?

Upon typing in the URL and arriving at the opening page of the website (see Figure 3.5), the subject will see the links to the various continents in the world. In order to answer the first question, the subject needs some very basic geographical knowledge, that is, he or she must know that Malaysia is in Asia. The subject must then click on the “Asia” link circled in Figure 3.5.

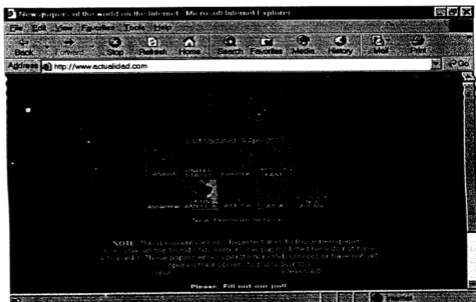


Figure 3.5 Image A of <http://www.actualidad.com>

Upon clicking on the “Asia” link, the subject will arrive at a page listing out the newspapers published in the countries in Asia. The subject will then have to scroll down to the section of the page listing the newspapers of Malaysia (see Figure 3.6).

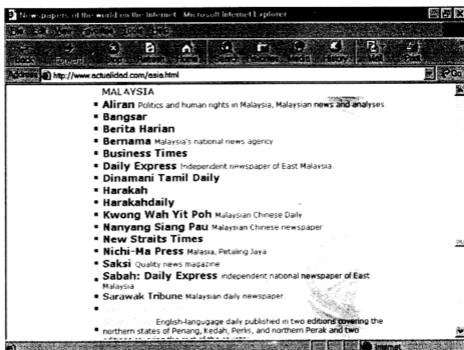


Figure 3.6 Image B of <http://www.actualidad.com>

At this point, apart from basic geographical knowledge, some very basic general knowledge is required of the subject in that he must be able to identify an *English* newspaper from Malaysia. In order to answer question 3b, the subject will have to click on any English newspaper and copy the headline. Advanced Internet skills are, once, again, not required as the subject only has to click on two links to arrive at the answer.

The fourth website is <http://www.guidedogs.com>. The two questions posed are:

- 4a. If you were a volunteer serving as a campus guide, what would your job description be?
- 4b. If you were coming from the San Francisco International Airport, which highway do you have to take first to get to the California campus?

In order to answer question 4a, the subject has to click on the “Volunteer Opportunities” link on the side bar that appears on the home page of the website (see Figure 3.7).



Figure 3.7 Image A of <http://www.guidedogs.com>

The link opens up to a bulleted list of volunteer opportunities shown in Figure 3.8. The answer can be found in the line “Campus guides: give tours”.

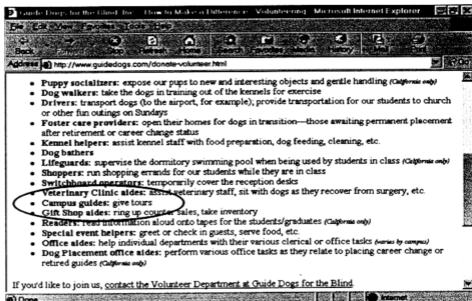


Figure 3.8 Image B of <http://www.guidedogs.com>

To answer the second question, the subject has to go back to the home page and click on the “Campus Locations, Maps and Directions” link on the side bar (see Figure 3.9).

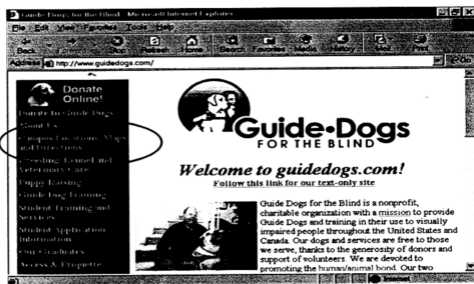


Figure 3.9 Image C of <http://www.guidedogs.com>

When the new page opens up, the subject has to click on the “Directions to the California campus” link on the side bar (see Figure 3.10).

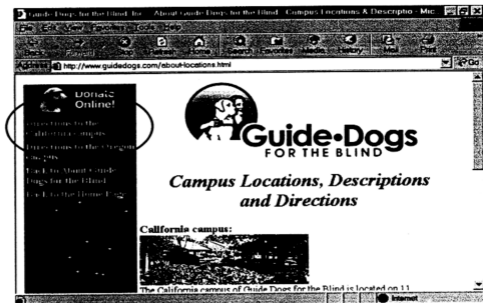


Figure 3.10 Image D of <http://www.guidedogs.com>

Then, the subject will have to scroll down to the section entitled “From San Francisco International Airport”. The answer is in the first bulleted point: “From the airport, get on Highway 101 going north for approximately ½ mile or so.” (see Figure 3.11)

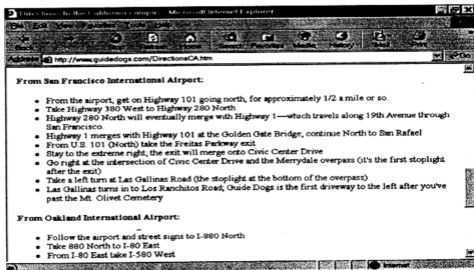


Figure 3.11 Image E of <http://www.guidedogs.com>

These questions are more difficult in the sense that both the questions for this website are longer, less straightforward and semantically more complex than the previous ones. Also, both questions require the subjects to click on a few links to find the answers.

And the fifth and final website is <http://www.shakespeare-online.com>. The three questions posed may appear simple but the task of finding the answers is not an easy one. The questions are:

- 5a. Name William Shakespeare's maternal grandfather.
- 5b. Name William Shakespeare's eldest sister.
- 5c. What did she die of?

Upon typing in the URL and arriving at the Shakespeare website, the subject has to realize that all three questions posed are in relation to Shakespeare's personal life and that he or she should therefore click on the "biography" link on the side bar of the home page (see Figure 3.12). The answers to all three questions are found in this link.

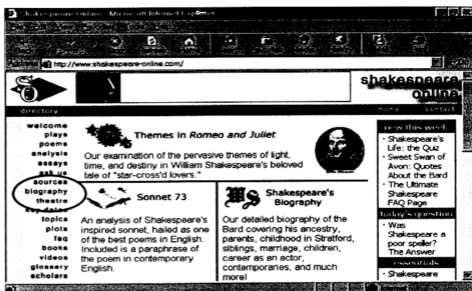


Figure 3.12 Image A of <http://www.shakespeare-online.com>

However, the “biography” link opens to a very text-oriented page. It contains no graphics and has a word-count of more than three thousand (see Figure 3.13). The subject has to read through the text thoroughly to find the answers.

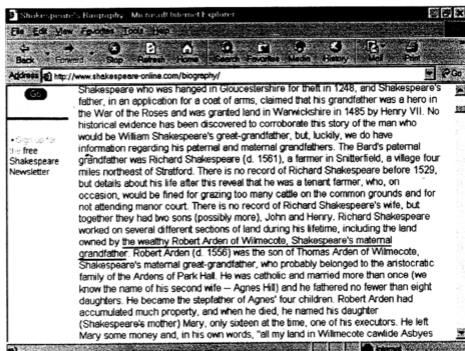


Figure 3.13 Image B of <http://www.shakespeare-online.com>

Provided the subject reads thoroughly, the answer to question 5a can be found quite easily in the sentence “Richard Shakespeare worked on several different sections of land during his lifetime, including the land owned by the wealthy Robert Arden of Wilmecote, Shakespeare’s maternal grandfather.” (underlined in Figure 3.13).

The second question is more difficult in that the answer in the web page appears as “Mary and John Shakespeare became parents for the first time in September of 1558, when their daughter Joan was born.” (see Figure 3.14). The subject has to, at this point, have read and discovered that Mary and John are William Shakespeare’s parents and that their first-born, Joan, is therefore, his eldest sister.

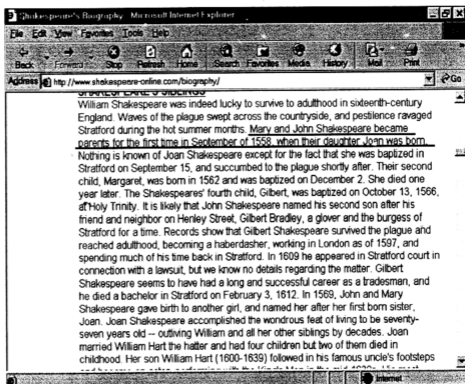


Figure 3.14 Image C of <http://www.shakespeare-online.com>

The answer to question 5c can be found in the sentence “Nothing is known of Joan Shakespeare except for the fact that she was baptized in Stratford on September 15, and succumbed to the plague shortly after” (see Figure 3.15).

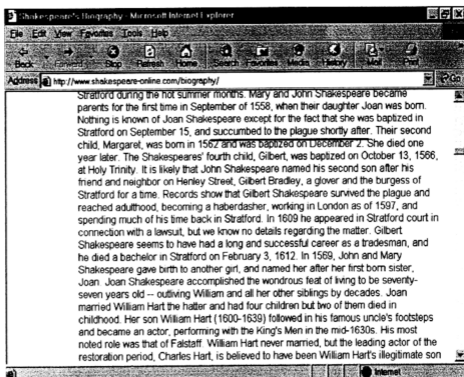


Figure 3.15 Image D of <http://www.shakespeare-online.com>

In order to answer this question, the subject must understand what the phrase *succumbed to the plague* means. Therefore, it is evident that although the subject merely has to possess very basic Internet skills, he or she must possess sufficient vocabulary and reading comprehension skills in order to find the answers in this text-oriented website.

As the subjects went about completing the treasure hunt, they were observed in terms of the number of correct answers obtained, the

length of time taken to answer each question and any other extraordinary behaviour they displayed.

3.2.3 Retrospective Interview

According to Merton et. al. (1956), a retrospective interview aims to elicit as complete a report as possible of the experiences involved during a particular situation. In other words, it sets out to capture the interviewee's "stream of experience" as he is engaged in a particular situation. To do so, the retrospective interview focuses on reinstating the situation or stimulus under review. Reinstating involves the interviewee having to recall the stimulus situation in which he was involved and his reactions to it.

Merton et. al. (1956) refer to this phenomenon of retrospective introspection as "retrospection". While "introspection" is an individual's present responses to the situation, "retrospection" is actually his responses at the time it was experienced. Retrospection, therefore, seeks to elicit stimulus-linked and detailed responses by encouraging the interviewee to recall his actual and immediate reactions to the stimulus.

3.2.3.1 Procedures Aiding Retrospection

Merton et. al. also put forth three procedures which may promote retrospection.

a) *Suggest both the original stimulus and the interviewee's immediate response.*

Eg. "You clicked on that particular link. Why?"

b) *Graphic re-presentation of the original situation.* This can be done quite easily by hitting the "back" button or re-entering the URL to go back to the web pages previously viewed. This is suitable to help the interviewee recall the stimulus in order to elicit detailed responses as well as to ensure that the interviewer and interviewee are referring to the same section of the stimulus.

c) *Verbal cues*

The interview questions are semi-structured to encourage retrospection. Questions must:

i) refer to the retrospective process.

Eg., "thinking back"; "if you look back".

ii) refer to the stimulus situation.

Eg., "the treasure hunt".

iii) be asked in the past tense

Eg. "how **did** you feel..."

Immediately after each subject had completed the treasure hunt, he or she was interviewed to find out why certain answers were given, why he or she spent a certain amount of time on a question or why he or she acted in a certain way or did a certain thing.

3.3 Selection of subjects

According to Patton (1990), purposeful sampling is "... to select information-rich cases whose study will illuminate the questions under study. Creswell (1994) supports this method because "the idea of qualitative research is to purposefully select informants that will best answer the research question. No attempt is made to randomly select informants."

The aim of this study is to observe the similarities and differences in terms of outcome, time taken and behaviour between students of differing English proficiency levels when they gather information via the Internet. Therefore, to ensure differences in proficiency levels, 10 subjects (S 1 to S 10) with higher proficiency levels (SPM English grades A1 and A2) and 10 subjects (S 11 to S 20) with lower proficiency levels (SPM English grades C4 – P7) were purposefully selected for this study to answer the research questions.

To identify the 20 subjects for the study, a questionnaire was designed and administered to a group of 30 second year Diploma in Electronic Engineering students in TAR College.

According to Pratt and Loizos (1992), questionnaires are an effective instrument of data collection as they can provide systematic, representative and reliable information about the research population.

A questionnaire was designed by the researcher and administered to identify the 20 subjects for the Internet treasure hunt (Refer to Appendix B). The response categories in the questionnaire were exhaustive, that is, they included all the possible responses that might be expected. This was ensured by adding a category labelled “Others (please specify)_____” (Babbie, 1998)

Section I of the questionnaire covered the personal particulars of the subjects as well as their exposure to English.

- Eg. Q2. Main language spoken at home
- 1 English Language
- 2 Bahasa Malaysia
- 3 Mandarin or other Chinese dialects
- 4 Tamil or other Indian dialects
- 5 Others (please specify) _____
-
- Q4. Medium of instruction in secondary school
- 1 English Language
- 2 Bahasa Malaysia
- 3 Others (please specify) _____

Section II dealt with the length and extent of their exposure to computers and the Internet.

- Eg. Q1. How long have you been using computers?
- 1 Under 1 year
- 2 1 – 2 years
- 3 2 – 3 years
- 4 More than 3 years

- Q6. What Internet activities do you engage in? (*You may choose **more than one** answer*)
- 1 Browsing/surfing
 - 2 E-mailing
 - 3 Chatting
 - 4 Online games
 - 5 Others (please specify) _____

Finally, Section III contained a Likert scale which covered the subjects' attitudes towards the Internet.

Eg. Q1. I enjoy using the Internet. SA A U D SD

Q3. It is difficult to use the Internet. SA A U D SD
Why? _____

Sections II and III were included in the questionnaire because two factors were controlled for this study:

- a) Length and extent of exposure to computers and the Internet
- b) Attitudes towards the Internet

In other words, all the 20 selected subjects had similar length and extent of exposure to computers and the Internet as well as similar positive attitudes towards the Internet.

3.3.1 Background of Subjects

All the subjects of the study were second year Diploma in Electronic Engineering students from Tunku Abdul Rahman College in Kuala Lumpur. The students were selected as subjects based on their English

proficiency, exposure to computers and the Internet as well as their attitudes towards the Internet. Subjects 1 to 5 obtained A1 for English in the SPM, subjects 6 to 10 obtained A2, subjects 11 and 12 obtained C4, subjects 13 and 14 obtained C5, subjects 15 to 18 obtained C6 and finally, subjects 19 and 20 obtained P7 (Refer to Table 3.1).

Subject	SPM English Grade	Subject	SPM English Grade
S 1	A 1	S 11	C 4
S 2	A 1	S 12	C 4
S 3	A 1	S 13	C 5
S 4	A 1	S 14	C 5
S 5	A 1	S 15	C 6
S 6	A 2	S 16	C 6
S 7	A 2	S 17	C 6
S 8	A 2	S 18	C 6
S 9	A 2	S 19	P 7
S 10	A 2	S 20	P 7

Table 3.1 Subjects according to English proficiency

The researcher's initial intention was to have two widely contrasting categories of subjects, that is, the group with better English proficiency would comprise subjects who obtained A1 or A2 grades for their SPM English paper and the group with weaker English proficiency would comprise subjects who obtained P7 or P8 grades. However, two subjects (S11 and S12) who had a C4 grade, two subjects (S13 and S14) who had a C5 grade and four subjects (S15, S16, S17 and S18) with a C6 grade had to be selected as there were not enough students within the sample with P7 or P8 grades. None of the students within the sample obtained a

P8 grade for their SPM English paper. Therefore, the selection of subjects was, to a certain extent, constrained by the sample.

A survey was carried out using the questionnaire described above in order to purposefully select 20 subjects for the study. Ten subjects had relatively higher English proficiency (A1 and A2 for SPM English) and ten subjects had relatively lower English proficiency (C4 – P7).

All the subjects had a minimum of one year's experience using computers and the Internet. They also accessed the Internet at least once a week. The average frequency of Internet use was 3.4 times per week. All the subjects displayed positive attitudes towards using the Internet. Table 3.2 shows the subjects' SPM English grades, the length and extent of their use of computers and the Internet and their attitudes towards the Internet.

Subject	SPM English	Computer Use (years)	Internet Use (years)	Main Internet Activity	Frequency of Internet Use (days/week)	Attitude Score *
S1	A1	>3	>3	Browsing	7	33
S2	A1	>3	>3	Browsing	2	37
S3	A1	>3	>3	Chatting	7	29
S4	A1	1-2	1-2	E-mailing	1	31
S5	A1	1-2	1-2	E-mailing	2	25
S6	A2	2-3	2-3	Downloading songs	5	30
S7	A2	>3	>3	E-mailing	3	31
S8	A2	2-3	2-3	E-mailing	2	28
S9	A2	>3	>3	Chatting	7	35
S10	A2	1-2	1-2	E-mailing	1	30
S11	C4	>3	>3	Browsing	2	28
S12	C4	>3	1-2	Browsing	3	30
S13	C5	2-3	1-2	E-mailing	1	30
S14	C5	1-2	1-2	E-mailing	3	26
S15	C6	>3	>3	Browsing	7	37
S16	C6	1-2	1-2	Chatting	4	33
S17	C6	>3	1-2	E-mailing	5	29
S18	C6	>3	2-3	Browsing	2	34
S19	P7	1-2	1-2	E-mailing	2	30
S20	P7	>3	>3	E-mailing	2	28

* Any score above 24 signifies a positive attitude. (Refer to Section 3.6.1 below for a detailed explanation)

Table 3.2 Subjects' SPM English grade, length, extent and frequency of computer and Internet use, main Internet activity and attitudes towards the Internet

The following is a brief description of each subject in terms of English proficiency, length, extent and frequency of computer and Internet use, and attitude towards the Internet:

S1

S1 obtained an A1 for his SPM English paper. He spoke English and Hakka at home and was educated in Malay-medium primary and

secondary schools. S1 had been using computers for more than 3 years and he used computers mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had been using the Internet for more than 3 years and accessed the Internet 7 days a week. However, he usually spent less than 1 hour using the Internet every day. His main Internet activity was browsing and he also engaged in e-mailing. The Internet was his main source of information for assignments and projects. On the whole, S1 had a very positive attitude towards using the Internet, scoring 33 out of 40 points.

S2

S2 obtained an A1 for his SPM English paper. He spoke mainly English at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for more than 3 years and he used computers mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had been using the Internet for more than 3 years as well and accessed the Internet twice a week for 1-2 hours at a time. When online, the Internet activity he mainly engaged in was browsing. Although he sometimes turned to the Internet for information for assignments and projects, his main source of information was books. He scored 37 points in terms of attitude towards the Internet, displaying his extremely positive attitude towards it. Together with S15, he had the highest score among all the subjects.

S3

S3 also obtained an A1 for his SPM English paper. His main language spoken at home was Mandarin. Both the primary and secondary schools he attended were Chinese-medium schools. S3 had been using computers for more than 3 years. He used computers for a vast array of activities, including the use of word processors, spreadsheets and/or databases, access to the Internet, playing games, listening to music and watching VCDs and DVDs. He had also been using the Internet for more than 3 years and accessed the Internet 7 days a week for more than 3 hours at a time. He used the Internet for browsing, downloading, e-mailing and participating in online forums. But the Internet activity he engaged in mainly was chatting. His preferred source of information for assignments and projects was the Internet. S3 also displayed a positive attitude towards the Internet, scoring 29 points out of 40.

S4

S4 obtained an A1 for her SPM English paper. The main language spoken in her home was Mandarin. She attended a Chinese-medium primary school and a Malay-medium secondary school. She had been using computers for 1-2 years mainly for the use of word processors, spreadsheets and/databases, access to the Internet and for playing games. She had been using the Internet for 1-2 years as well and went online once a week for less than an hour at a time. She used the Internet mainly for e-mailing and she also used it for browsing. Although she used the

Internet to obtain information for assignments and projects, her main source of information was books. On the whole, S4 had a positive attitude towards using the Internet as she scored 31 points for attitude.

S5

S5 also obtained an A1 for her SPM English paper. She mainly spoke Mandarin at home. Both the primary and secondary schools she attended were Chinese-medium schools. She had been using computers for 1-2 years and mainly used word processors, spreadsheets and/or databases. She had been using the Internet for 1-2 years as well and went online twice a week for 1-2 hours at a time. She used the Internet for browsing and, mainly for e-mailing. Her preferred source of information for assignments and projects was books, although she also turned to the Internet for information. Her attitude towards the Internet was generally positive, except for the fact that she found it slightly difficult to use because she was not very familiar with it. She scored 25 points for attitude, one point above a neutral score.

S6

S6 obtained an A2 for his SPM English paper. He mainly spoke Mandarin at home. He was educated in a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for 2-3 years mainly to access the Internet. He went online 5 days a week for 2-3 hours at a time, mainly to download songs. Although he obtained information for assignments and projects from magazines,

the Internet was his main source of information. He obtained a score of 30 points for attitude towards the Internet.

S7

S7 obtained an A2 for his SPM English paper. He spoke Mandarin at home and received both his primary and secondary education at Malay-medium schools. He had been using computers for more than 3 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had also been using the Internet for more than 3 years and accessed the Internet 3 times a week for less than an hour at a time. His main Internet activity was e-mailing although he also engaged in browsing and chatting. The Internet proved to be his preferred source of information for assignments and projects, although he also obtained information from books and magazines. On the whole, he displayed quite a positive attitude towards the Internet, scoring 31 points.

S8

S8 obtained an A2 for his SPM English paper. Mandarin was the main language spoken at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for 2- 3 years, mainly for access to the Internet and to play games. He had been using the Internet for 2-3 years and went online twice a week for 1-2 hours at a time. He used the Internet primarily for e-mailing. The Internet was also his main source of information for

assignments and projects. He scored 28 points in terms of attitude towards the Internet.

S9

S9 obtained an A2 for his SPM English paper. He spoke Mandarin at home. He attended a Chinese-medium primary school and an English-medium secondary school. He had been using computers for more than 3 years, mainly for access to the Internet. He used the Internet 7 days a week for 2-3 hours at a time. His main Internet activity was chatting, although he also used the Internet for e-mailing. Information for assignments and projects was obtained from the Internet, books, newspapers and magazines, with the Internet being his main source of information. S9 had a very positive attitude towards using the Internet, scoring 35 points.

S10

S10 obtained an A2 for her SPM English paper. The language spoken in her home was Mandarin and she was educated in Chinese-medium primary and secondary schools. She had been using computers for 1-2 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. She had been using the Internet for 1-2 years and went online once a week for 1-2 hours at a time. She used the Internet mainly for e-mailing and chatting. Although she also obtained information for assignments and projects from books, newspapers and magazines, the Internet was her preferred

source of information. S10 scored 30 points in terms of attitude towards using the Internet.

S11

S11 obtained a C4 for his SPM English paper. His main language spoken at home was Mandarin. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for more than 3 years and he used computers mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had also been using the Internet for more than 3 years and he accessed the Internet twice a week for 1-2 hours at a time. He used the Internet for a wide variety of activities, including browsing, e-mailing, chatting, playing online games, downloading software and watching live multimedia coverage of sporting events. His main Internet activity was browsing. Although he referred to books and magazines for information for assignments and projects, his main source of information was the Internet. S11 also displayed a generally positive attitude towards the Internet, scoring 28 points.

S12

S12 obtained a C4 for his SPM English paper. He spoke mainly Mandarin at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for more than 3 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had

been using the Internet for 1-2 years. He went online 3 times a week for 1-2 hours at a time. Browsing was his main Internet activity and he also engaged in e-mailing and playing online games. His main source of information for assignments and projects was books but he also obtained information from the Internet, newspapers and magazines. In general, S12 had a very positive attitude towards using the Internet, scoring 30 points.

S13

S13 obtained a C5 for his SPM English paper. His main language spoken at home was Mandarin. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for 2-3 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had been using the Internet for 1-2 years. He went online once a week for 1-2 hours at a time. His main Internet activity was e-mailing but he also used it for browsing. Although he also obtained information for assignments and projects from books, his preferred source of information was the Internet. S13 also scored 30 points in terms of attitude towards the Internet.

S14

S14 also obtained a C5 for her SPM English paper. The main language spoken in her home was Mandarin. She was educated in a Chinese-medium primary school and a Malay-medium secondary school. She had

been using computers for 1-2 years, mainly for the use of word processors, spreadsheets and/or databases and for access to the Internet. She had been using the Internet for 1-2 years, accessing it 3 days a week for 1-2 hours at a time. Her main Internet activity was e-mailing but she also used it for chatting. The Internet was her preferred source of information for assignments and projects, although she also referred to books for information. S14 had a slightly positive attitude towards using the Internet, scoring 26 points, which was 2 points above a neutral score.

S15

S15 obtained a C6 for his SPM English paper. His main language spoken at home was Mandarin. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for more than 3 years and he used computers mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had been using the Internet for more than 3 years, accessing it 7 days a week for 1-2 hours at a time. His main Internet activity was browsing. Apart from that he also used the Internet for e-mailing and chatting. Although he also referred to books for information for assignments and projects, his preferred source of information was the Internet. He had an extremely positive attitude towards the Internet. He and S2 both obtained the highest score of 37 points.

S16

S16 obtained a C6 for his SPM English paper. He spoke mainly Mandarin at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for 1-2 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. He had been using the Internet for 1-2 years. He went online 4 days a week for 1-2 hours at a time. His main Internet activity was chatting, although he also engaged in browsing and e-mailing. The Internet was his main source of information for assignments and projects. S16 had a positive attitude towards using the Internet, scoring 33 points.

S17

S17 obtained a C6 for her SPM English paper. The main language spoken in her home was Mandarin. She was educated in a Chinese-medium primary school and a Malay-medium secondary school. She had been using computers for more than 3 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. She had been using the Internet for 1-2 years, accessing it 5 days a week for 1-2 hours at a time. She used the Internet mainly for e-mailing. Apart from that, she also used it for browsing and chatting. The Internet was her main source of information for assignments and projects, although she also obtained information from newspapers. She scored 29 points in terms of attitude towards the Internet.

S18

S18 also obtained a C6 for her SPM English paper. She spoke mainly Mandarin at home and both her primary and secondary schools were Chinese-medium schools. She had been using computers for more than 3 years, mainly for the use of word processors, spreadsheets and/or databases, access to the Internet and for playing games. She had been using the Internet for 2-3 years, accessing it twice a week for 1-2 hours at a time. Although her main Internet activity was browsing, she also used it for e-mailing and chatting. Her main source of information for assignments and projects was the Internet. Apart from this, she also obtained information from books and magazines. In general, S18 also had a positive attitude towards using the Internet, obtaining a score of 34 points.

S19

S19 obtained a P7 for his SPM English paper. He spoke mainly Mandarin at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for 1-2 years, mainly for access to the Internet. He had less than a year's experience using the Internet and he went online twice a week for 1-2 hours at a time. He accessed the Internet mainly for e-mailing, although he also used it for browsing and chatting. The Internet was his main source of information for assignments and projects, but he also referred to books for information. On the whole, S19 had a positive attitude towards the Internet, scoring 30 points.

S20

S20 also obtained a P7 for his SPM English paper. Mandarin was the main language spoken at home. He attended a Chinese-medium primary school and a Malay-medium secondary school. He had been using computers for more than 3 years. He used computers for a variety of things including the use of word processors, spreadsheets and/or databases, access to the Internet, for playing games, listening to music and watching VCDs. He had been using the Internet for more than 3 years as well, accessing it twice a week for 1-2 hours at a time, mainly for e-mailing. He also used the Internet for browsing, chatting and playing online games. The Internet was his preferred source of information for assignments and projects, although he also referred to books and his friends for information. S20 scored 28 points in terms of attitude towards using the Internet.

3.4 Pilot Studies

According to Martin (1996), pilot studies need to be carried out to derive a suitable method for recording observations. Two pilot studies were carried out with one subject each time to test the data collection method and instruments.

3.4.1 The Internet Treasure Hunt and Retrospective Interview

An Internet treasure hunt was sourced from <http://www.aitech.ac.jp/~iteslj/th/1/mg-th001.html>. This particular treasure hunt was created by Melinda Gleeson and can be accessed at the above-mentioned URL and used as an online ESL activity by anyone (Refer to Appendix C).

During the pilot test, the subject was given a printout of the web page containing the Internet treasure hunt questions so that she could record her answers. Notes were taken by the researcher as the subject completed the treasure hunt by clicking on the given links. After the subject had completed the questions, a retrospective interview was carried out to find out how she arrived at her answers. An example of a question posed by the researcher during the retrospective interview was "While you were answering question 1a, you clicked on the headline. Why did you do that?"

It was discovered during the pilot test that some of the links on the web page were outdated and some of the contents of certain websites had since been altered. As such, not all the answers to the questions could be found.

As a result of this, an adapted treasure hunt was created by the researcher based on the original treasure hunt. The outdated web pages were replaced with updated ones the researcher obtained by conducting a search of the Internet. The new treasure hunt contained a list of websites and questions. The questions were modified to reflect an increasing level of difficulty. This was done to better ascertain whether there is a difference between the way students of differing English proficiency levels gather information via the Internet. A second pilot study, inclusive of a retrospective interview, was carried out with this treasure hunt and it was found to be an effective instrument because it

helped the researcher in answering the research questions. Therefore, the second treasure hunt was adopted as the instrument to be used for data collection.

3.4.2 Observation Sheet

In the course of the first pilot study, it was discovered that a prepared observation sheet would very much help to facilitate the recording of observations (Refer to Appendix A). The first observation sheet, designed and used in the second pilot study, included one more column which was for the researcher to record the number of mouse clicks the subjects made in order to arrive at their answers. However, during the pilot study, it was discovered that counting the number of mouse clicks made by the subject was not feasible as some subjects tended to be “trigger happy”, that is, they had the habit of clicking at random although they were aware that the links clicked on would not lead them to the answer. Therefore, in the final version of the observation sheet used in the actual study, this column was eliminated.

3.5 Data Collection

The questionnaire was administered simultaneously to 30 second year Diploma in Electronic Engineering students in TAR College. From these 30 responses, 20 subjects were purposefully selected mainly based on their English proficiency, length and extent of exposure to computers and the Internet, and attitudes towards the Internet. Out of the 20 selected subjects, 10 had relatively high proficiency levels (grades A1 or A2 for SPM English) and the other 10 had

relatively low proficiency levels (grades C4 to P7). However, all 20 subjects had similar length (a minimum of 1 year) and extent of exposure (at least once a week) to computers and the Internet as well as similar positive attitudes towards the Internet.

Upon identifying the subjects, each of them was asked to select a time slot in the following week for a one-to-one session with the researcher to complete the Internet treasure hunt. At the beginning of each session for each subject, he or she was given a sheet of paper containing the list of URLs and the questions. Each subject was given two minutes to read through the list and told to try their best to find the answers. Each subject was informed that the Internet treasure hunt was merely an activity and not test. They were also told that there would be no time limit for the activity. In addition to that, they were informed that questions could be skipped if, after trying their best, the answer could not be found. The subjects were told to record their answers on the given list. Although the use of online or computer tools and functions was allowed, it was deliberately not mentioned by the researcher so as not to prompt or interfere with the subjects' normal Internet information gathering behaviour. All the subjects carried out the activity using the same computer in the same cubicle in the Communication and Information Technology Centre (CITC) of TAR College. Apart from that, the browser and all the websites used were standardized for all the subjects.

Throughout the week, while each subject went about completing the Internet treasure hunt, the researcher unobtrusively timed and observed them. The

observations were recorded in the prepared observation sheet. If the subject answered a question correctly, the researcher would insert a tick in the corresponding column but if the answer was incorrect, the researcher would insert a cross. The researcher also recorded the length of time that lapsed from the time the opening page was fully loaded to the time the subject recorded the answer. Other relevant observations such as the subject clicking on wrong links were also noted in the final column of the observation sheet. A separate observation sheet was used for each subject.

Immediately after each subject completed the hunt, he or she was interviewed in order to elicit the reasons behind the answers given as well as to seek clarification regarding particular behaviour observed by the researcher. All this was carried out in the privacy of the individual cubicle in the CITC of TAR College.

It was decided that the Internet treasure hunt activity and the subsequent interview which followed each subject's session would not be video-taped. This was because the activity was a very straightforward and relatively brief one and the researcher could easily record her observations on the prepared observation sheet. Apart from this, setting up a video camera in the cubicle would not have been feasible due to space constraints as the cubicle only measured approximately 3 by 5 feet.

3.6 Data Analysis

According to Creswell (1994), the process of data analysis is eclectic; in other words, there is no “right way” to analyze data.

There were essentially two sets of data collected in this study: one quantitative, and the other, qualitative. The quantitative data consisted of the data obtained from the administration of the questionnaires as well as the results of the Internet treasure hunt recorded in the observation sheets. The qualitative data consisted of the observations recorded by the researcher while the subjects went about completing the Internet treasure hunt as well as from the interviews conducted with each of the subjects.

Based on the research questions stated, all the data collected were then analyzed to see if there were indeed differences between the way students of differing English proficiency levels gather information from the Internet. And, if so, what the differences were.

3.6.1 Procedures of Data Analysis

Since the research population on this study consisted of a mere 20 subjects, a detailed statistical analysis was not conducted. Also, due to the modest body of data gathered, it was not necessary to use computers to analyze the quantitative data. Therefore, the results of the survey and the Internet treasure hunt were manually tabulated by the researcher.

Essentially, the data collected via the questionnaire were analysed using frequency counts. Section III of the questionnaire contained a Likert scale to identify the subjects' attitudes towards the Internet. Each category was given a score which corresponded to the question. For positive questions such as "I enjoy using the Internet", the scoring system would be 5 points for "strongly agree", 4 points for "agree", 3 points for "undecided or uncertain", 2 points for "disagree" and 1 point for "strongly disagree". However, for negatively phrased questions, such as "I do not think the Internet is appropriate for learning", the scoring system would be inverted i.e. 1 point for "strongly agree", 2 points for "agree", 3 points for "undecided or uncertain", 4 points for "disagree" and 5 points for "strongly disagree".

Since there were 8 questions in the section, the maximum score that could be obtained by a subject who had a positive attitude towards the Internet would be 40 points, a subject with a completely neutral attitude would score 24 points and a subject who had a completely negative attitude towards the Internet would score a minimum of 8 points (see Figure 3.16 below).



Figure 3.16 Attitude scores

The data collected from the actual implementation of the Internet treasure hunt were both quantitative (the number of correct answers obtained and the length of time taken) and qualitative (the researcher's observations).

While the quantitative data were quite easily analysed and tabulated using frequency counts, the process of data analysis used for the qualitative data is known as *analytic induction*, which is a "process that is inductive in that it begins with observations and analytic because it goes beyond description to find patterns and relationships among variables" (Glasser & Strauss, 1967).

The data obtained via the observations and interviews were reviewed numerous times, and then condensed and organized in such a way that the central themes and patterns could be identified. The data were then compared to the tabulated quantitative data so that comparisons and contrasts could be drawn and displayed (Baker, 1999). This process of comparing and contrasting also helped to determine the relationships between variables and enabled the researcher to use the strength of the relationships to draw conclusions (Miles & Huberman, 1994).

The results will be presented and discussed in the next chapter.