CHAPTER FOUR

DATA ANALYSIS

4.1 Introduction

The purpose of this study was to investigate the differences in the choice of metacognitive and cognitive reading strategies employed by ESL learners while reading expository texts in print and hypertext. Specifically, this study sought to answer the following research questions:

- the type of metacognitive and cognitive reading strategies ESL learners use when reading expository texts in print

- the type of metacognitive and cognitive reading strategies ESL learners use when reading hypertext

- the differences in the type of metacognitive and cognitive reading strategies employed by ESL learners while reading in print and hypertext

- the type of metacognitive and cognitive reading strategies ESL learners perceive they use while reading hypertext

This chapter discusses the process of data analysis for this study. The process of data analysis consists of:

1. transcribing of data

2. identifying and categorizing the reading strategies

3. analyzing the questionnaire

4. marking the summaries

4.2 Data transcription

The think-alouds and the retrospective think-alouds which were audio taped were transcribed verbatim

4.2.1 Think-aloud Protocol

10 subjects were required to verbalise their thoughts while reading a printed text and a hypertext. These think-aloud responses were audio taped. The recorded responses were then transcribed which included pauses, repetition, false starts and self reports. This was done because all of these features could provide important information related to the cognitive processing (Kasper, 2000). Since some of the subjects during the think-aloud sessions spoke in L2, their reports were transcribed in Bahasa Malaysia verbatim and then translated to English. The English versions of these transcriptions were given back to the subjects to make sure what they had said while reading the two texts were all included in the transcriptions. Then only were the transcripts coded. The average time taken for transcribing the think-aloud responses varied from subject to subject depending on the amount of reporting each subject did.

4.2.2   Retrospective Verbal reports

Immediately after the think-aloud task, the retrospective interview was conducted. The audio taped concurrent think-aloud was played back and the researcher and the subject listened to the tape. This session allowed the researcher to ask

questions, clarify statements and also obtain confirmation on statements that were incomplete. This technique rests on the premise that confronting the subject once again with the task situation by means of audio recording provides reactive traces in short-term memory, thus allowing the subjects to report their cognitive processing with an acceptable degree of accuracy (Faerch and Kasper, 1987). Furthermore, collecting and cross-referencing data from the think-aloud protocol and cued retrospective recall interview allows checking for consistency as well as completeness of these accounts (Greene and Higgins,1994).

The researcher stopped the tape at any point where there was a need for clarification or where there were ambiguities. The subject would then verify, validate and further clarify what was being said on the tape. This session was also audio taped. All the audio-taped interviews were transcribed and where necessary the data was combined with the concurrent verbal reports.

4.3   Identification and categorization of strategies

The researcher identified the reading strategies based on the transcripts of the think-aloud reports. All the transcripts were double-checked for accuracy. A coding scheme of strategies was adopted from Sheorey & Mokhtari (2001) and Anderson (1991,2003). The coding scheme also includes an abbreviated code with a strategy term and a description. Given below is the table showing the list of strategies with its descriptions and codes.

Table 4.1 Reading Strategy CODE and the Description

Reading Strategy Codes adopted from Sheorey and Mokhtari (2001), and Anderson (1991, 2003).

	STRATEGY	CODE	DESCRIPTION
	METAGOGNITIVE		
1.	Reading purpose	**Rp**	Keeping reading purpose in mind
2	Previewing text	**Prev**	Skimming to get an overall view of the text and relate to what they know
3	Noting text characteristics (Recognize text structure)	**NW**	Looking at key words or idea, cohesive device or structure of a sentence/paragraph or length and organisation
4	Determining what to read	**DM**	Decide what to read closely and what to ignore eg. Unknown words
5	Using text features	**TF**	Eg. Tables, pictures, aids etc, to increase understanding of text
6	Using typographical aids	**TA**	Eg. To help identify key information
7	Confirming Predictions	**Cpred**	Check if guesses about the text are right or wrong
8	Evaluating / Analysing/ Commenting on what is read	**EVA**	Critically analyse and evaluate the information

9	Using context clues	**CC+T**	Context is used to understand text information
10	Read on	**RO**	Deciding to read on to comprehend the text
11	Monitoring Comprehension	**MC**	Assess his or her degree of understanding of the text, and attempts to make repairs
12	Comments on the task itself	**CT**	Express his or her views about the task.
13	Comments on own behaviour and process	**CBP**	The reader expresses awareness of the components of the process, describes strategy use in case of comprehension failure
	COGNITIVE		
14	Anticipate Contents / Making Predictions	**Pred**	Reader predicts what content will occur in succeeding portions of the text
15	Using prior knowledge / Background information(Think about what I know to help me understand what I read)	**PK**	Explain and clarify content, evaluate the veracity(truth) of content or react to content
16	Adjusting reading rate (Reading slowly and carefully)	**ARR**	Adjust reading rate based on text difficulty / To make sure the reader understands
17	Pausing and thinking about reading	**P+TA**	Before each red dot or point or idea. Hm….(short hesitation, during the think aloud)
18	Visualizing information	**VIS**	To help remember or comprehend the text

19	Reread	**RR**	Reread some portion of the text to help comprehend the text
20	Guessing meaning of unknown words / phrases (Voc.)	**GM**	Suffix/prefix/stem Context
21	Summarizing	**Sp** **Sw**	• Some portion of the text • Whole text
22	Integrating Information	**IT**	Connects new information with previously stated content
23	Reacting to text information	**RTI**	Responds affectively to text content
24	Interpreting information	**II**	Assesses and makes inferences or draw conclusions from the text
25	Questions information of the text	**Qinf**	The reader questions the significance of the content read.
26	Repeating Words	**RW**	The reader repeats unknown words
27	Sentence Division	**SD**	The reader divides the sentence into parts to make it comprehensible
28	Trying to stay focused on reading	**SF**	Get back on track when the reader loses concentration
	SUPPORT		
29	Taking notes	**TN**	While reading to help understand the text

30	Underline / circle information in the text	**UT**	Mark relevant / important information on the text
31	Using reference materials	**RM**	Using either dictionary or thesaurus.
32	Paraphrasing	**Pp**	Restate ideas or content for better understanding
33	Going back and forth in the text	**GBF**	To find relationships among ideas
34	Asking Questions / Questioning understanding	**Q+W**	Stating failure to understand a portion of the • Text • Words / Phrases • Sentence
35	Translate from English to L1	**T+W** **T+S**	• Word / Phrase • Sentences
36	Think about information in both L1 and L2	**TEL1**	Some portions in L1 and English
37	Other strategies	**OS**	

The inventory assisted in identifying and determining which reading strategies students employ when reading a text in print and hypertext, and guide the classification of strategies.

In order to identify the strategies used while reading in print and hypertext, two lecturers were enlisted to work with the researcher in identifying the reading strategies used and categorizing them in a meaningful way.

Firstly, the purpose of the study was explained to the raters and then they were

instructed to independently identify and categorize the strategies for four transcripts (2 printed texts and 2 hypertext) using the coding system of strategies prepared by the researcher. The raters were told that the subject might resort to many other strategies during reading and that they should carefully analyze any other types of strategies that might be used.

The method of analysis consisted of first reading the protocol transcripts and marking the parts of the concurrent verbal reports containing the strategies using the appropriate abbreviated analysis codes in the margins of the transcripts. The raters and the researcher then met to compare codes, calculate percentage of agreement for reliability, and resolve differences in coding. Any differences in coding, with respect to strategy type, were resolved through discussion referring back to the coding scheme and further clarifying definitions and distinctions of categories when necessary.

Once the raters were more confident and comfortable they worked on the rest of the transcripts. They then only met with the researcher to review differences in their coding. Thus, all coded data were agreed upon by the two other raters and researcher, either in initial coding or after discussion. At the conclusion of the task, the raters were required to count the number of occurrences of those strategies.

In general, a relatively high degree of agreement was reached among the raters. Interrater reliability was 81% for the researcher and one coder, and 78% for the researcher and the other coder. Any discrepancies remaining in coding were resolved through discussion.

For each coded transcript, frequency counts of each strategy category were calculated. Each occurrence of a particular strategy was counted as one instance, whether it lasted for 1 second or 1 minute. Therefore, the response to one sentence might contain several strategies and several instances of the use of one strategy. Qualitative descriptions of the responses of each participant for both passages were also prepared. The data were analysed using descriptive statistical procedures. The median, standard deviation and coefficient of variation were calculated. The Spearman correlation analysis was also used to analyze the correlation between the three categories of metacognitive, cognitive and the support strategies. The Wilcoxon test of significance was used to examine whether significant difference existed between strategies used in the printed text and hypertext with respect to metacognitive, cognitive and support strategies.

4.3.1   Reading Strategies and Excerpts

The following are examples of excerpts of the metacognitive, cognitive and support strategies identified from both printed and hypertext think- aloud transcripts.

1. Reading Purpose

This strategy was identified when a subject kept the reading purpose in mind when doing the tasks. The subjects were required to write a summary after reading both texts (print and hypertext).

Example 1

"I am going to read an article about shifting paradigms and write a summary….." ok

Example 2

"My main purpose is to memaham (understand) this passage….."

2. Previewing Text (Prev)

This strategy is used when the subject skims through the text to get an overall view of the text and relate it to what he or she knows.

Example 1

"Let me see what this is about….hm …."

Example 2

"What is this? What is this picture?"

3. Noting text characteristics (Nw)

This strategy is used when the subjects recognized or was aware of certain text characteristics like keywords, cohesive devices, structure of sentence or even the length and organization of text or paragraph.

Example 1

"There are seven paragraphs that I need to read."

Example 2

"ok ….aa… this sentence explains...

"… explains the meaning of the sentence before"

Example 3

" There are hyperlinks in this sentence

" …. I want click here."

4. Determining what to read (PM)

This strategy involved the subjects in deciding what to read closely and what to ignore.

Example 1

"ok … I need to read back to relate"

Example 2

"I will not read it so as not confuse myself as I clearly know the meaning of ecotourism."

5. Using text features (TF)

This strategy was utilized when a subject used the tables/pictures or aids to help increase his or her understanding of the text.

Example 1

"What does this picture has to do with it?"

Example 2

"ok … I can see a picture of a jungle"

6. Using typographical aids (TA)

The strategy was used when a subject used typographical aids such as the highlighted words and letters, to help identify key information in the text.

Example 1

"There are seven paragraphs. I know how long it will take to finish reading …."

Example 2

"This is written in blue which distinguishes it from other passages"

7. Confirming predictions (Cpred)

This strategy was utilized when a subject checked if guesses about the text are
right or wrong.

Example 1

"… strengths my prediction about the passage"

Example 2

"As I expected"

8. Evaluate / Analyze / Comment on what is read (EVA)

This strategy was used when a subject critically analyzes and evaluates
the information from the text.

Example 1

" to help the problems that they have .…"

Example 2

*" Mungkin dia nak jimat kot. Nak bagi jimat …" (Maybe he wants to save.
..give savings)*

9. Using Context Clues   (CC + T)

This strategy was identified when a subject used the context to understand text
information.

This strategy was not utilized by any of the subjects.

10. Read On (RO)

This strategy was used when a subject decided to read on in the hope that the following sentence will help him or her comprehend the text.

Example 1

" .... let just read further on ... ."

Example 2

" I am going and move on ...."

11. Monitoring Comprehension (MC)

This strategy was utilized when a subject attempts to assess his or her degree of understanding of the text and attempts to make repairs.

Example 1

" Mm... I can't understand the whole passage, but I need to reread it again."

Example 2

" Still not understand about this ... ok .. moving on ."

12. Comments on the task itself (T)

This strategy was identified when a subject makes comments on the task itself.

This strategy was not utilized by any of the subjects.

13.   Comments on own behaviour and process (CBP)

This strategy was identified when a subject expresses awareness of the components of the process and describes strategy use in case of comprehension failure.

This strategy was not utilized by any of the subjects.

14. Making Predictions (Pred)

This strategy was utilized when a subject predicts what will occur in succeeding portions of the text.

<u>Example 1</u>

"… must be about some eco …".

.… Ok maybe something about the forest"

<u>Example 2</u>

"… maybe a motivational passage"

15. Using Prior knowledge (PK)

This strategy was utilized when a subject uses his background knowledge to explain   clarify of the text. It also includes the subjects' reaction to the content.

<u>Example 1</u>

" … like the economic recession in 1998"

<u>Example 2</u>

"I think this is like swamp lake … the swamp thing"

16. Adjusting Reading Rate (ARR)

 This strategy was utilized when a subject deliberately reads the text slowly and carefully to try and understand a difficult sentence on phrase.

 The subject would reread it very slowly. One or two subjects would say aloud that he or she is going to reread it slowly but most of them just reread slowly.

17.   Pausing and thinking about reading (PTA)

This strategy was utilized when a subject hesitates for a short period of time to reflect on a word or sentence that he or she has read.

<u>Example 1</u>

 "Hmm ….. 21st Century ……"

<u>Example 2</u>

 "Aaa ….yes ….mm … ok"

18.   Visualising information (VIS)

 This strategy was utilized when a subject as he/she reads visualizes what he/she reads to help him/her remember or comprehend the text.

<u>Example 1</u>

 "Albert Einstein, I am trying to picture Albert Einstein as a person not only who had knowledge and information."

<u>Example 2</u>

 " .. I am trying to picture freedom."

19. Reread (RR)

This strategy was used when a subject rereads a part of a sentence or text to help comprehend the text.

Example 1

" *I think I should read this once more ….*"

Example 2

"*… I should read …. The para once agains …*"

20. Guessing meaning of unknown words phrases (GM)

This strategy was identified when a subject used suffix /prefix or context to guess meaning of unknown words.

Example 1

" *.. tour operator is the tour guide*"

Example 2

" *ok … I think standard industry … maybe … travelers*"

21. Summarizing (SP)

This strategy was utilized when a subject summarized some parts of the text.

Example 1

" *… ok so I can sum up the idea…..*"

Example 2

" *Ok, this is about outdoor activities, camping and so …on. Ok …*"

22. Integrating information (IT)

This strategy was utilized when a subject attempts to connect new information with information previously stated in same text.

Example 1

" *Just now Edward de Bono … the approach lateral thinking*"

Example 2

" *I'm trying to enm …. Find the meaning between this sentence … an the previous para …*"

23. Reacting to text information (RTi)

This strategy was identified when a subject responds affectively to the text.

Example 1

" *Asking too many questions*"

Example 2

" *Ini dah biasa dengar …*" *(This we always hear)*

" *Ah!... that's very vital*"

24. Interpreting information (II)

This strategy was utilized when a subject makes inferences or draws conclusions from the text.

Example 1

" *Maybe this is the way they use to work in the company … ok*"

Example 2

" *Ok ,,, it's a learning concept. Alright*"

25. Questions Information of the text (Qinf)

This strategy was identified when a subject questions the significance

of the information in the text.

    <u>Example 1</u>

   " … Oh I thought lateral thinking…."

    <u>Example 2</u>

    " What has the that got to do with child"

26. Repeating Words (RW)

This strategy was utilized when a subject repeats unknown words from the text as a

means of trying to comprehend the word.

    <u>Example 1</u>

   " …. Proliferation…"

    <u>Example 2</u>

   " … minimize the impact …"

27. Sentence Division (SD)

This strategy was utilized when a subject divides the sentence into parts to make in

comprehensible.

    <u>Example 1</u>

   " … this sentence is long so I will break it up …"

    <u>Example 2</u>

  " OK I will do like before because this sentence is long I will break it to

  two."

28. Trying to stay focused on reading (SF)

This strategy was identified when a subject attempts to refocus on the text after

losing concentration.

Example 1

" ..ok let me continue ."

Example 2

"…balik…pada text" (get back to the text)

29. Taking Notes (TN)

This strategy was utilized when a subject takes down notes while reading

to help understand the text.

Observation 1

The subject listed down the activities involved in ecotourism.

Observation 2

The subject wrote down the benefits

30. Underline important information (UT)

This strategy was identified when a subject marks important information in the

text.

Example 1

" Oh I would like to underline this … better"

Example 2

" This is important I should mark it"

31. Using reference materials (RM)

This strategy was identified when a subject uses a dictionary to understand difficult words.

For the printed text and hypertext this reading strategy was not used.

32. Paraphrasing (Pp)

This strategy was utilized when a subject tries to restate an idea or information for better understanding of the text.

Example 1

" Oh … that means after they travel, then they have got nothing, so it is because of the lack of regulation to std industry.

Example 2

" Mm ,,, however the money benefits is not goes to the place itself".

33. Going back and forth in the text (GBF)

This strategy was utilized when a subject went back and forth while reading certain portions of the text. This was done to help the subject find relationships among ideas or to clarify a point.

Print

The subject would look at the sentences above or below if he or she did not understand.

Hypertext

They would just scroll up or down the text.

34.   Asking questions (QT)

This strategy was utilized when a subject begins asking questions to himself when there is failure to understand a portion of the text or sentence.

> Example 1
>
> " *What is that niche? I don't know …"*
>
> Example 2
>
> " *Soft adventure is like what?   aa …ok"*

35.   Translate from English to L1 (T)

This strategy was utilized when a subject translates a word, phrase or sentence from English to Bahasa Malaysia.

> Example 1
>
> " *It is "tadika" …. (It is ….Kindergarden)*
>
> Example 2
>
> " *Ecotourism is something in Malay it means Pelancongan.*
>
> *Pelancongan Alam Sekitar."*

36.   Think about information in both English and L1 (TEL 1)

This strategy was identified when a subject thinks of some portions of the text in L1 and English.

> Example 1
>
> " *lepas ini … normal individuals"(after this …normal individuals)*
>
> Example 2
>
> " *Oh so it shows that …. Dia orang tak akan mengaut any*
>
> *keuntungan".(He is not going to make any noise about the profit)*

4.4 Questionnaire

For the OSORS, all the students (N=10) responses for the 38 items were scored within the three subscales:

- Metacognitive (global)

- Cognitive (problem-solving) and

- Support

The medians, standard deviations and the coefficients of variation were calculated to identify the strategies ESL learners perceive themselves to be using when reading hypertext.

4.5 Summary

The subjects were required to write a summary after reading both the printed text and hypertext. Bernhardht, (1983) encourages the use of summary as a "method of testing foreign language reading competence which circumvents the pitfalls of traditional test design and, at the same time, focuses on the communication between reader and text"

The summary was scored for the presence of the number of main ideas, supporting details and general understanding of the text. A strict criterion was adopted in which distortion of the original texts were not allowed. Paraphrases were accepted but elaborate inferences were not. The researcher enlisted the help of a colleague to mark the summary. Interrater reliability coefficient conducted on the summary marked for both printed and hypertext was found to be 0.82. Then both the scores for printed text and hypertext were compared.