Identifying the Metacognitive Reading Strategies of Arab University Students: A Case Study

استراتيجيات القراءة "البعد ادراكية" التي يستخدمها طلاب الجامعة العرب: دراسة حالة

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Abstract

This paper reports on the metacognitive reading strategies employed by Palestinian students while reading English texts in the light of a case study of two English majors. Moreover, the intention of this study is to use multiple research methods in identifying the participants' thinking processes. To collect data, the researcher used "think aloud" as an instrument for tapping the participants' underlying metacognitive thinking. In order to complement the "think-aloud" sessions, the researcher used interviews, comprehension tests and a questionnaire. The results indicated that although "think-aloud" seemed to be a suitable introspectiv method for measuring comprehension control and awareness, retrospective methods such as interviews, tests and questionnaires were also important. It was also found that although verbalizing was challenging, the participants were interested in thinking aloud and involved in using a number of metacognitive strategies that aided their awareness and text comprehension. Finally, implications for EFL teachers and reading comprehension research are discussed based on the findings.

ملخص

تبحث هذه الدراسة في الاستراتيجيات البعد إدراكية (Metacognitive) للقراءة التي يستخدمها الطلاب الفلسطينيون عند قراءة نصوص باللغة الإنجليزية وذلك على ضوء دراسة حالة لطالبَيْ تخصص لغة إنجليزية، إضافة إلى ذلك فقد هدفت الدراسة إلى استعمال أساليب مختلفة لتحديد عملية التفكير للمشتركين في الدراسة. من أجل جمع معلومات للدراسة استخدمت الباحثة طريقة التفكير بصوت مسموع كأداة لتحديد الاستراتيجيات البعد إدراكية للتفكير عند المشتركين. وقامت الباحثة كذلك بإجراء مقابلات، وامتحانات استيعاب وتوزيع استبانة وذلك لإتمام جلسات التفكير بصوت مسموع. أظهرت النتائج أن التفكير بصوت مسموع من الممكن أن يكون مناسباً وناجحاً في قياس الوعي الاستيعابي والسيطرة عليه، إلا أن المقابلات والاختبارات والاستبانة مهمة كذلك. كما أظهرت الدراسة بأن التفكير بصوت مسموع كان مثيراً للتحدي ولاهتمام المشتركين الذين استعملوا عدة استراتيجيات بعد إدراكية ساعدتهم على أدائهم واستيعابهم للنصوص. أخيراً نوقشت تطبيقات لمدرسي اللغة الإنجليزية كلغة أجنبية ولأبحاث الاستيعاب والقراءة بالاعتماد على النتائج.

Introduction

Research in reading indicates that reading is an active process in which reders attempt to make sense of what they read by employing a group of strategies such as skimming, adjusting pace, making sense of titles, rereading, predicting, drawing conclusions and using prior knowledge. These strategies are deliberate and conscious methods that decide how readers comprehend a text, what clues they use, and what actions they take when they don't understand[1-2]. In other words, the reading strategies that the readers use seem to reflect their resources for understanding a printed text. Reading goes beyond understanding words, sentences or even texts. It involves language proficiency (overall ability to use the language), prior knowledge (back ground knowledge) and metacognitive strategies (strategies that involve knowledge about cognition and self regulation).[3] According to Shuyum Li and Hugh Mumby, (1996), EFL studies have revealed that reading is a very complex and demanding process in which students actively use metacognitive processes.

This paper investigates the metacognitive strategies employed by native speakers of Arabic while reading in English. The study aims at examining the thinking processes using "think-aloud" protocols complemented by other procedures such as interviews, tests and a questionnaire. Up to the researcher's knowledge, this is one of the first studies on using "think-aloud" for identifying the reading strategies of Arabic-native speakers. The significance of this study stems from the fact that research literature on Arab readers' metacognition is scarce since the literature that the researcher reviewed which covered a wide reange of articles, didn't include any research that deals will reading comprehension and metacognition in Arab Universities. The researcher's experience as an English teacher has shown that Arabic-native speakers encounter many difficulties while reading English texts. According to the two subjects in this study, (two Arabic-native speakers majoring in English at An-Najah University) reading in English is difficult and very demanding specially reading literary texts.

It is hoped that this study will contribute to the understanding of L2 reading and provide teachers and students with knowledge and insights in Arab students' thinking processes in order to control their reading and promote their understanding. Such information can have implications for foreign language teaching, teachers and students.

Theoretical Background

Metacognition is defined as knowledge about knowledge or thinking about thinking. Flavell[5], P.233, described metacognition as one's knowledge concerning "one's own cognitive processes or anything related to them". According to Tei & Stewart[6] metacognition is having knowledge (cognition) and having understanding, control, and suitable application of that knowledge. Thus it involves both conscious awareness and conscious control of one's learning. In other words, metacognition is the ability to stand back and observe oneself applying the knowledge. Brown[7] applied metacognitive theory to reading and differentiated between cognitive and metacognitive strategies. She concluded that cognition strategies include strategies that are applied through the learning process, such as predicting, summarizing, questioning, clarifying, imagery, rehearsal etc., while metacognitive strategies are strategies for thinking about and planning for learning.

Although metacognition has many different but related definitions, it involves thinking about cognition or thought and it includes these important elements[8]:

- Planning: this involves identifying the purpose for reading and selecting appropriate strategies to reach it,
- Regulating: this includes monitoring and directing one's efforts during the course of reading to reach the desired goals, and
- evaluation which deals with the appraisal of one's cognitive abilities to perform the task and reach one's reading goals.

A number of studies describing the strategies used by L2 readers e.g.[1,9-10] pointed out two strategies: "top-down" and "bottom-up" information processing. Moreover, Block's[1] coding system groups strategies into two levels: general comprehesion strategies (these include comprehension gathering and monitoring which are considered top-down-reader centered strategies) and local strategies (which deal with the readers' intention to comprehend certain linguistic units, and are considered bottom-up-text-centered strategies).

Research also indicates that the reading process tends to be similar in all languages[11-12]. Therefore it is assumed that a learner who is a good native language reader can be a good second-language reader. However; Feng & Mokhtari[13] suggested that differences existed and that strategies were used more frequently when reading in English than in a native language. Block's[1] study showed that EFL readers didn't appear to use strategies different from those of native speakers. Another study by Block[14] illustrated that similar

comprehension monitoring processes were used by first and second language readers of English in a language program as they read expository prose. The researcher argues that differences exist between EFL readers and native speakers while reading for comprehension. Such differences might be attributed to varieties in culture, social and educational background. Moreover, the way people and individuals process thinking while reading vary according to sex, age, level of education, subject, purpose of reading and interest.

Brown[13] indicated that metacognitive strategies help readers monitor and regulate their thought. These satrategies are skills that can be used voluntarily and consciously and can become automatic due to practice. It is thought that good readers are in general good thinkers who can function automatically and are able to recognize a problem and apply a variety of problem-solving strategies. In contrast, students' failure to comprehend has been attributed to disorganization and ineffective use of goal-oriented strategies which include planning before reading, monitoring understanding, and evaluating results[16], and lack of metacognitive activities[17].

Metacognition is an important element in differentiating between proficient and less proficient readers. According to Grabe[16], proficient readers have knowledge of cognition, and language which includes organization, patterns of structure and using suitable strategies that help them process a particular text. Skilled readers also search for specific information and are able to formulate questions. Block[1-12] argued that good readers are more aware of the strategies they use, and are more flexible in adapting strategies than poor readers. Moreover, good readers adjust their strategies to the type of text and to the purpose of reading. They distinguish between important information and details as they read, and are able to use clues in the text to predict new information and relate it to previous knowledge[6]. Research has also shown that more effective readers employ metacognitive strategies before, during and after their reading in order to enhance comprehension[19]. In a recent study[20] added that successful readers are active participants. They use their previous knowledge in order to comprehend a text, and as they learn new information they modify their original schemata, ie. knowledge structures associated with a specific state, event or concept. On the other hand, the primary difficulty for poor learners is lack of coordinating thinking processes[21-22]. Low-achieving readers need to acquire strategies that will result in comprehension, through assisting, motivating and building confidence which are essential in improving the performance of these students.

In this study, metacognition will be illustrated based on Block's[14] assumption that good readers are able to think aloud and verbalize their awareness of the metacognitive strategies they use.

The "think-aloud" method is suitable in providing information about the difficulties English readers might face when they encounter reading tasks[1-23]. Reports from "think-aloud" have been widely used in both L1 and L2 reading research with the aim of giving a clearer picture of what learners generally do while reading in a foreign language e.g.[9-10-24]. Many researchers used a combination of methods (self-reports, behavioral protocols, interviews, questionnaires, comprehension tests, observing and "think-aloud") as a means of triangulation and overcoming weaknesses of a given methodology. In this study, "think-aloud" was complemented by interviews, comprehension tests and a questionnaire. Thus the cognitive processing and strategies needed to understand a text can be traced through verbalization in a "think-aloud" session. The working of metacognitive awareness will be viewed in the light of the following case study of two subjects.

Methodology

Subjects

Two senior students majoring in English at An-Najah National University in Palestine were chosen to participate in this study. The first subject was a female (Muna, henceforth), while the second was a male (Sami, henceforth). Both were presumably very good learners of English as reflected by their general point average (GPA) in the English courses that they have covered up to the date of the experiment; (85%) for Muna, and (84%) for Sami. Both subjects showed great interest in the study and were willing to participate.

Research Instruments

The measures used to define and assess metacognitive strategies in this study included:

A: "Think-Aloud" reports

For the purpose of verbalizing one's thoughts, three expository passages were chosen from the TOEFL books 1991 and 1998. The passages were approximately 200-250 words each. The topics were, generally, familiar to the subjects: common cold, animal communication, and the future of the universe. In order to prompt the subjects to verbalize their thoughts while reading the texts, red dots were put after every sentence as an indication to start verbalizing.

The subjects were told about the aim of the study and were given instructions on how to think aloud. Both of them read the same texts and were asked to verbalize and say aloud anything that they were thinking about using either Arabic (their native language), English or both languages. The "think-aloud" reports were tape-recorded. There was a total of 3 "think-aloud" sessions for every subject. Each session took 40-60 minutes. When the sessions were over, the tape-recorded material was transcribed for analysis.

Although the "think-aloud" reports of the 3 texts for every subject will be analyzed and discussed in this study, only the "think-aloud" reports of two different texts will be provided as examples of the thinking processes of the two subjects since these reports gave a clear and a comprehensive picture of the various strategies that the two subjects used. The third text appears in Appendix 1.

B: Interviews

An interview was conducted immediately after every "think-aloud" session. The purpose was to provide more information about kinds of strategies used by the subjects as a complementary procedure to the "think-aloud"-reports. It was hoped that other strategies could be captured during the interviews. The questions that were asked during the interviews in this study were either general such as: "Do you think in Arabic?" "Do you translate? Why? How"? or specific to the text involved such as: "What confused you"? "How did you understand this word?" There were 3 interviews for every subject each of which lasted 30-45 minutes.

C: Comprehension tests

A multiple-choice test was given following every reading comprehension passage in order to check understanding. Each reading passage was followed by 5-7 multiple-choice questions. These were the questions that appeared after each passage in the TOEFL books. (Questions to text 3 appear in Appendix (1); while questions to texts one and two appear in Appendix(3)). Block[1-14] used tests to complement "think-aloud" tasks.

D: Questionnaire

Levine and Reves[23] argue that "think-aloud" and questionnaires complement each other. The idea behind using more than one instrument was to investigate a wide range of strategies and thinking processes. It is assumed that if one method fails to demonstrate a strategy, another might succeed in drawing attention to it, and thus complement the thinking process. In this study,

Miholic's[24] Reading Strategy Awareness Inventory was used (Appendix 2) in order to provide more data on the reading strategies that the subjects employed while reading English texts. The questionnaire illustrates strategies like skimming, scanning, predicting, guessing, making inferences and using prior knowledge. At the end of all sessions, the subjects were asked to fill out the questionnaire.

Results of the Study

Data Analysis

The study was designed to investigate the metacognitive strategies used by two Palestinian students while reading texts in English using multiple research methods: "think-aloud" protocols, interviews, tests and a questionnaire.

Following is a description of the four methods:

1. "Think-Aloud" Reports Analysis

The tape-recorded material of the "think-aloud" reports was transcribed for analysis with the help of 3 judges: teachers of English and Arabic. The judges worked together in trying to identify the strategies used by the subjects. The strategies that were identified were put between two brackets **[].** In order to give a complete picture of the thinking process of the two subjects, the "think-aloud" reports of a whole text will be provided as an example rather than giving sentence excerpts.

Note: whenever the word translating appears between two brackets, it means that the subject is switching to his/her native language (Arabic).

The following text is an example of the 3 texts that Sami read and verbalized:

Text 1

Another critical factor that plays a part in susceptibility to colds is age. A study done by the University of Michigan School of Public Health revealed particulars that seem to hold true for the general population. Infants are the most cold-ridden group, averaging more than six colds in their first year. Boys have more colds than girls up to age three". After the age of three, girls are more susceptible than boys, and teenage girls average three colds a year to boys' two.

The general incidence of colds continues to decline into maturity. Elderly people who are in good health have as few as one or two colds annually. One exception is found among people in their twenties,

especially women, who show a rise in cold infections, because people in this age group are most likely to have young children. Adults who delay having children until their thirties and forties experience the same sudden increase in cold infections.

The study also found that economics plays an important role. As income increases, the frequency at which colds are reported in the family decreases. Families with the lowest income suffer about a third more colds than families at the lower end. Lower income generally forces people to live in more cramped quarters than those typically occupied by wealthier people, and crowding increases the opportunities for the cold virus to travel from person to person. Low income may also adversely influence diet. The degree to which poor nutrition affects susceptibility to colds is not yet clearly established, but an inadequate diet is suspected of lowering resistance generally.

Following is Sami's "think-aloud" report of the text.

"succep …. susceptibility is a difficult word. I'll repeat the first sentence in order to know what it means [repetition]. I still don't know what it means. I need to consult a dictionary [seeking help from dictionary]. The first sentence is still unclear. I'll go to the second sentence in order to get a clear picture of the meaning of the first sentence [delaying conclusion]. The second sentence is not helping. I'll go on [monitoring comprehension]. "Cold-ridden group"? It is a difficult phrase. Again I need the help of the dictionary. It is a new phrase to me [seeking help]. Ok, I think that understanding paragraph 2 depends on knowing the meaning of "susceptibility", and the word "colds". It is appearing again in paragraph 3. It is confusing me. What do they mean? I'll repeat paragraph 1 [repetition]. Colds are born with people and grow to a certain stage [guessing meaning from context]. I'm reading the third paragraph. I can say now that the passage is about "feelings" [predicting]. Oh. I've made a mistake. "Infection" is not the same as "affection" [translating and verifying information]. My understanding of the passage depends on the meaning of "colds". I'm confused. I can't concentrate [emotional reaction]. I'll repeat the second paragraph [repetition]. May be the word "colds" is related to social relationships within the family [trying to use contextual clues]. I'll go on to the third paragraph. Oh . Here the meaning of cold is clear. It is a disease caused by virus [translating]. Virus is a key word [using key words to guess meaning]. The economic factor plays an important factor in having this disease [paraphrasing]. Now the picture is clear [confirming information]. Poor people are more likely to be affected by

this disease [translating and paraphrasing]. This means that rich people who live in healthy houses are not likely to be affected by colds [commenting and translating].

The following text is an example of the 3 texts that Muna read aloud and verbalized.

Text 2

Pigeons have been taught to recognize human facial expressions, upsetting long-held beliefs that only humans had evolved the sophisticated nervous systems to perform such a feat. In recent experiments at the University of Iowa, eight trained pigeons were shown photographs of people displaying emotions of happiness, anger, surprise, and disgust. The birds learned to distinguish between these expressions. Not only that, but they were also able to correctly identify the same expressions on photographs of unfamiliar faces. Their achievement does not suggest, of course, that the pigeons had any idea what the human expressions meant.

Some psychologists have theorized that because of the importance of facial expression to human communication, humans developed special nervous systems capable of recognizing subtle expressions. The pigeons cast doubt on that idea, however.

In fact, the ability to recognize facial expressions of emotion is not necessarily innate even in human babies, but may have to be learned in much the same way pigeons learn. In experiments conducted several years ago at the University of Iowa, it was round that pigeons organize images of things into the same logical categories that humans do.

None of this work would come as any surprise to Charles Darwin, who long ago wrote about the continuity of mental development from animals to humans.

Following is Muna's "think-aloud" report

"The passage is on how pigeons can recognize human facial expressions [using main idea]. "Upsetting long-held beliefs?" What is this? What does the author mean? [questioning]. "Feat" is another difficult word in the first sentence

[translating]. May be it is related to misbeliefe about human facial expressions [predicting]. Who taught pigeons? [questioning]. It is strange [translating and reacting to text]. How can pigeons be taught to react to human facial expressions? [questioning information]. Interesting. This arouses curiosity [reacting to text]. I'll go on to the second paragraph. They are comparing human brain and bird brain [concluding]. We usually compare human brain and animal brain [translating and using prior knowledge]. We have contradiction here; first they say that it is a misbeliefe that pigeons can learn human expressions, and now they say that expressions "have to be learned in the same way pigeons learn" [monitoring comprehension]. Charles Darwin? How is he related to the experiment? Do they believe in his ideas? [questioning]. Man evolved from a monkey [translating and using prior knowledge]. I'll read the passage again [rereading]. "Upsetting long, held beliefs". I'll read the first sentence again [repetition]. I conclude that the beliefs are not fixed or stable [guessing]. "Feat" here means belief, I think [guessing]. I'll go on. Eight? Eight what? [questioning]. Oh. eight trained pigeons. It is a compound [using text structure]. Eight pigeons were trained [confirming information]. Oh yes. I understand that pigeons can distinguish expressions but don't know their meaning [confirming information]. Pigeons distinguish images of expressions [confirming information]. There are differences between man and birds in the nervous system [translating]. The ability to recognize expressions is innate. Innate [translating and paraphrasing]. It seems that the university of Iowa is interested in this area [commenting]. But why? What is the purpose [questioning]. May be to study how children distinguish facial expressions [guessing]. They are not innate [translating]. The results of this study serve Darwin's view [commenting].

In order to analyze the "think-aloud" data for this experimental study, the researcher used the frequency method for computing the most frequently used strategies. The data showed that the two subjects invoked in a variety of strategies in order to understand the three texts. The strategies that they reported were: repetition, using prior knowledge, paraphrasing, self-questioning, translation, guessing, predicting, seeking outside help from the dictionary, using contextual clues, confirmation, paying attention to key words, making conclusions, visualizing, commenting and reacting to text. However, the most frequently used strategies in the three texts were repetition, translation, paraphrasing questioning, and confirming information. Table (1) shows frequency of the strategies that were employed by the two subjects while verbalizing the three texts.

Table (1): Strategy frequency of the 3 texts for the two subjects

Strategy	Sami				Muna			
	Text 1	Text 2	Text 3	Total	Text 1	Text 2	Text 3	Total
Repetition	3	4	5	**12**	3	4	4	**11**
Checking the dictionary	2	1	1	**4**	0	1	0	**1**
Contextual clues	2	1	2	**5**	1	1	1	**3**
Predicting	1	1	0	**2**	1	1	1	**3**
Translation	6	5	6	**17**	8	6	5	**19**
Confirming information	2	1	1	**4**	3	2	1	**6**
Guessing	1	0	0	**1**	2	1	1	**4**
Paraphrasing	2	3	3	**8**	1	3	3	**7**
Visualizing	1	0	1	**2**	0	0	0	**0**
Commenting	1	0	0	**1**	1	1	0	**2**
Using key words	0	1	2	**3**	1	0	0	**1**
Questioning	0	2	1	**3**	6	4	3	**13**
Reacting to text	0	1	2	**3**	3	1	1	**5**
Concluding	1	1	1	**3**	3	1	1	**5**
Using prior knowledge	0	1	1	**2**	2	0	1	**3**

2. Interviews Analysis

The researcher conducted the interviews as a complementary procedure to "think-aloud" protocols in order to capture the strategies that were not verbalized in the think alouds. Examples of the strategies that were indicated in the interviews but not in the "think-aloud" reports are given below.

Excerpts from Sami's 3 interviews which followed every "think-aloud" report.

Interviewer: You didn't think aloud while you were reading paragraph 3, why?

Sami: Because I was confused, I skimmed the paragraph in order to get the general meaning. Repetition was not helpful. The key word "virus" was in the last paragraph.

Interviewer: You switched to Arabic more than once. Why did you translate?

Sami: Arabic translation helps me understand better. I'm used to thinking in Arabic not in English. I always give myself time to translate mentally

what I read in order to understand. I like to think in Arabic not in English. I feel more comfortable when I translate.

Interviewer: You said: "Now the picture is clear". What did you mean?

Sami: I could imagine crowded houses. I had a picture in my mind from movies on crowded houses of poor families affected by cold virus; some sneez, others cough …etc. There were lots of things on my mind that I could not express even in Arabic.

Interviewer: Why did you pause and put your finger under some words?

Sami: It was because then I was stopping to think about the meaning of the word "susceptibility. I usually do this. It helps me concentrate on knowing the meaning of a word.

Interviewer: What steps did you follow before verbalizing?

Sami: I think that reading, thinking and reporting all at one time are very difficult tasks specially when I have to read in English, think in Arabic, translate into Arabic and report in English or Arabic. It is very complex. It's challenging.

Excerpts from Muna's three interviews which followed her "think-aloud" reports.

Interviewer: Your thinking aloud in this text (text 3) was limited. You were silent most of the time. Why?

Muna: I didn't do a lot of thinking aloud because I was not concentrating. There were things on my mind. Things that were not related to the text. I was somewhat tensed and this affected my ability to concentrate and verbalize my thoughts.

Interviewer: When you said that "we have analogy here". You smiled. What were you thinking about?

Muna: The analogy here was interesting. I liked it. It made me think about our track in life and about planning our universe. Analogy means using a simple thing to make things easy to understand; a train and man's future. I smiled because I liked that way of using analogy.

Interviewer: You repeated and translated the word "however", why?

Muna: I know that "however" is a signal word for showing contrast. I have repeated it in order to stress my understanding of the two contrasting ideas. The two ideas were not clear.

Interviewer: I noticed that you asked many self questions why?

Muna: I believe that thinking aloud is interesting. It stimulates reading. I'm not familiar with it. When I think aloud I have to concentrate. I try to complete the circle of my thoughts with more details. Verbalizing is good because it forces me to ask questions. It is helpful although I rarely ask myself questions while reading English texts. I think they are (questions) important for understanding. Questioning is a training for the mind.

Interviewer: Why did you put your head between your hands when you reread the phrase "upsetting long-held beliefs"? what were you thinking about?

Muna: When I read "upsetting long-held beliefs" I became confused. I paused and needed to concentrate so I put my head between my hands. I was trying to focus on the previous words so I decided to reread the sentence. When I face difficulty in understanding, I pause, go back, reread, think, try to concentrate then go on.

A careful analysis of the interviews in the light of the "think-aloud" reports provides interesting and additional information on the subjects' reading comprehension processing. The following points were noticed during the interviews:

- When the subjects didn't think aloud, they either paused or were silent. The indication was that they were either confused or trying to concentrate. The subjects' emotional reaction couldn't be captured during the "think-aloud".

- When Sami was visualizing information and forming mental pictures of ideas, he didn't say aloud what was taking place on his mind. The retrospective interview was valuable in adding details to the data by introducing more information about the aspects of the thinking process.

- When Muna said that she repeated words in order to understand, the implication was that she understood what the word "however" indicated when she repeated it. In the interview she indicated that she knew that "however" showed contrast but was not able to determine the two contrasting ideas.

- When Sami and Muna were switching languages and mentally translating words and sentences into Arabic, they didn't say that they were translating. Such a strategy was clarified through the interview when Sami, for example, said that he always thought in Arabic and always translated English words and sentences into Arabic to enhance his understanding.

3.   Comprehension Tests Analysis

Each reading passage was followed by a 5-7 MC. questions testing text understanding, main idea, supporting details, logical relationships, author's intention and conclusion. Surprisingly enough, although the "think-aloud" reports indicated that the subjects engaged in deep and complex thinking processes that their understanding of the texts was questionable, they answered almost all the questions on the tests correctly except for two questions. Sami answered questions two and three to text 2 incorrectly, while Muna answered questions two and four to the same text incorrectly. It is assumed that checking comprehension reading abilities of the subjects depending on answering the questions correctly indicates text understanding. Answering the multiple choice questions that followed each text correctly, however, didn't indicate that the subjects were fully aware of their thinking processes when they were thinking aloud. It should be taken into consideration that the way the questions were set was a key factor in suggesting and guiding the students to know the answer, and that the purpose of the reading tasks was another important element. The reasons for reading could range from answering the questions that follow a text in an exam, to verbalizing thoughts and reading for pleasure. In his "think-aloud" report, Sami showed confusion on what the author meant by the word "switches", although he resorted to repetition and guessing. However, he answered correctly question number (4), text 3 on "the function of the unseen switches". Similarly, Muna's self questioning "Is the study about children or elderly people?" indicated that she was not able to make the inference that appeared in the test that "infant boys are more likely to catch cold", or to conclude that "children infect their parents with colds". Her answers of inference and conclusion questions (3) and (5), text 3 were, however; correct. Based on the finding of this study, it was obvious that one method, in this case, the test, can't be considered a comprehensive indicator of awareness of the thinking process.

4.   Questionnaire Analysis

After analyzing the questionnaire of both subjects it was observed that there were substantial differences and similarities between the subjects' think alouds, interviews and questionnaire. It was noticed that there were differences between Muna's "think-aloud", interview and questionnaire. In the questionnaire, Muna mentioned that she would ask herself questions about the important ideas; however, in her interview she indicated that she rarely used self questioning which she was forced to use during the "think-aloud". In her

questionnaire, she also indicated that she would underline or summarize what she didn't understand. During her "think-aloud", she never underlined or summarized. In addition, in her "think-aloud", the reason for not understanding a particular sentence while reading was not clear. In the questionnaire, she mentioned that the reason could be that sentences were contradicting one another. In addition, during her "think-aloud", she never showed what she did when she was confused. From her questionnaire, it was observed that she would keep on reading until the text was clarified, or read first and then look back if the text was still clear or not.

Substantial differences between Sami's "think-alouds", interniews and questionnaire were also observed. Sami's questionnaire revealed that he used more and different strategies from the ones demonstrated in his "think-aloud" reports. In his reports, Sami frequently reread the text whenever he encountered a difficult word or a confusing sentence. In the questionnaire, however, he claimed that he would skim and read ahead, then look back if the text was unclear. The questionnaire revealed many strategies such as sounding out difficult words, using the words around the difficult word to figure its meaning, temporarily ignoring difficult words and waiting for confirmation. His "think-aloud" reports, however, did not reveal sounding out difficult words or using words that were around a difficult word trying to guess their meaning. In his questionnaire, Sami also claimed that he asked himself questions about the important ideas, such a strategy was not observed in his "think-aloud" reports. Moreover, Sami's questionnaire indicated that he thought about what he knew about the subject, and that misunderstanding of a particular sentence was the result of not developing adequate links or associations for new words or concepts in the sentences. His questionnaire also revealed using predicting, comparing and contrasting frequently. These strategies were non existent in his think alouds.

On the other hand, there were similarities between the subjects' think alouds and their questionnaire. Some strategies reported by them during the "think-aloud" were the same as those indicated on the questionnaire. Both of the subjects didn't seem to think that planning was needed. They just started reading toward completion of the assignment. They were interested in finishing the assignment in as short a period of time as possible. The two subjects also agreed that they would read a sentence again if they didn't know what it meant. In their questionnaire, both indicated that not understanding a word might cause them to read the entire passage over again. Rather than trying to know the meaning of difficult words by looking at the words around them, they would

read the sentence first, then use a dictionary. Strategies for guessing meaning from context were not clear, and sometimes difficult. It was obvious that both of them reread the text when it was difficult, but didn't adjust their pace according to the difficulty of the reading selection. In addition, Sami and Muna indicated that there were many strategies that could aid their understanding, and that they were not aware of all these strategies. Verbalizing some of these strategies was sometimes not only difficult but also impossible. Finally, a questionnaire could serve as an important tool in measuring and evaluating the strategies that the students are aware of but don't use, and those that they are not aware of and don't know how, when and why to use. Identifying strategies through a questionnaire can be helpful in designing activities for strategy training inside the classroom.

Discussion and Implications

Although the subjects thought that "think-aloud" was interesting and beneficial, they believed that it was difficult to demonstrate. The "think-aloud" task according to them, focused their attention on the process of reading and understanding at the same time. The "think-aloud" reports indicated that the two subjects actively strove in trying to understand the texts by using a variety of strategies. Both of them were aware of their need to be aware of their thinking process and tried to control and monitor this process. In general, their use of strategies was haphazard, and limited. The most frequent strategies were repetition, paraphrasing, translation and self questioning. According to Block's[1] coding system, these strategies are local strategies dealing with comprehension of words and sentences at the linguistic level at the expense of contextual information and text analysis. Moreover, they are superficial strategies that are used by less proficient readers in order to help them translate the image of the text into their native language. This lack of concentration on textual relation, grammatical rules and language implications showed that the students were not trained in using reading strategies. Although the two subjects chose English language to verbalize their thoughts since they were English majors, they sometimes resorted to Arabic language and were engaged in two kinds of translation: literal (which was obvious in the "think-aloud") and mental (which was obvious in the interview). Kern[25] found that as proficiency increases, the use of translation decreases. However, the two subjects were assumed to be reasonably proficient learners as measured by their GPA. The findings of this study raise a question on whether good learners are necessarily good and proficient readers. This finding was consistent with[28] who reported

that even successful learners often used ineffective or simple-fix-up reading strategies such as guessing the meaning of unfamiliar words or phrases rather than getting the general meaning. The implication for English teachers is that even proficient university learners need strategy training in reading skills because they need to comprehend a large mass of materials both in their studies at the university and at home. Furthermore, rereading and repetition were frequent characteristics of the subjects' "think-aloud" thinking processes. They either reread part of a sentence or the whole sentence or paragraph. Rereading and repetition could be attributed to the subjects' awareness that their difficulty was in forgetting a previously read piece of information that was needed for understanding the text. Rereading also meant that it was necessary to concentrate and clarify certain things before going on with reading. It was believed that the cause of repetition was the fact that thinking aloud was interfering with their ability to comprehend the meaning of a word or a sentence. The result of rereading was not always understanding; the subjects either delayed their conclusions or quit rereading and went on. According to[29] repetition and translating are mechanical thinking strategies that are used by less proficient readers. The subjects failed to be proficient readers because they settled for literal meaning rather than reading for general meaning. They focused on decoding words and they rarely looked a head or back to monitor their understanding. Their nonstrategic reading indicated limited practice in the strategies, poor instruction and reluctance to use unfamiliar strategies.

The subjects' "think-aloud" reports also indicated that they seemed to be reading word by word. They tried to guess the meaning of difficult words by adopting rereading first, then guessing, and translating and resorting to Arabic. When they failed, they focused on their knowledge of the language rather than the content. Their strategies relied on reading for understanding words and sentences rather than reading for the main idea; skimming. It was also observed that in general, Sami was more verbal in the "think-aloud" than Muna, and used more strategies in the questionnaire. However, Muna used self-questioning in her "think-aloud" reports more than Sami. It is important to note that conclusions and generalizations based on the findings of this case study are not only tentative but can also be detrimental. In general, the subjects' reporting of their thoughts in their think aloud reports was not automatic, rather, it was very slow, unplanned and superficial whenever they faced difficulty in understanding. The subjects didn't seem to use the right strategy to solve their comprehension problem. The strategies they used were not in harmony with the difficulties they faced while reading. The findings from the "think-aloud"

protocols should help us to understand better the processes that take place in the mind of the reader. Moreover, such knowledge and understanding can have implications for foreign language teaching. In reading strategy training, raising students awareness of strategies and their applications is of great importance. Since reading skills can be expected to transfer from L1 to L2, it would be more profitable to make readers aware of the strategies they already know. The readers should be instructed to monitor strategy use, in addition to knowing which strategies to use, when, where and why to use them.

Moreover, the interviews revealed strategies that were not reflected in the "think-aloud" such as skimming, translating mentally and showing emotional reaction such as confusion and lack of concentration. In the interview Sami revealed that reading aloud was more helpful than thinking aloud since he was not used to silent reading. Muna added that "think-aloud" was not needed and would be limited when texts were easy. On one hand, the result of the comprehension tests indicated the subjects' understanding of the texts when they answered almost all the questions correctly. On the other hand, the results of "think-aloud" analysis were quiet different and reflected lack of control over the thinking process. This finding questions the reliability of "think-aloud" alone in judging comprehension. The "think-aloud" reports cannot be seen as providing a comprehensive account of the strategic repertoire of the subjects for the following reasons:

- The strategies that were reported in the "think-aloud" might include a small group of strategies that the subjects were aware of at the time of the study. The subjects in this study seemed to use more strategies in the questionnaire than in their think alouds.

- Individual differences played an important factor in this study. Pritchard[9] believed that individuals vary in their ability to talk about their strategy use, thus it was possible that their reports were incomplete compared with their actual strategy use. In this study for example, Sami used more strategies than Muna. Such an observation may be attributed to the direct relationship between individual differences and strategy use. In this study, Muna believed that sociable and talkative students may be better at verbalizing their thoughts than shy and reserved students. In addition, the use of more strategies in the questionnaire implies that it is easier for the subjects to identify strategies already mentioned than to think about and verbalize the same strategies. The subjects got insight from the items that the questionnaire

provided. The subjects' inadequate and limited strategy use is attributed to lack of training and unawareness of various strategies.

- It was observed that when the text was easy, the subjects used less strategies and didn't verbalize their thought readily than when the text was difficult. Similarly[13] found out that strategies were used more frequently for difficult texts. Among the other factors that aided verbalizing were text familiarity, interest and attitude towards content. For example, when Muna was upset and her mind was busy with different thoughts, her ability to verbalize was limited. On the other hand, when she liked the topic she was verbal and was involved in self-observing, self-questioning, reporting and commenting.

Block[1] and Carrell[27] found out that reading ability and strategy use tend to be dependent on language proficiency. However, this study indicated that although the two subjects were proficient learners, their use of effective reading strategies and their ability to verbalize were to some extent limited. According to them, verbalizing was difficult, since they were exposed to such an experience for the first time.

The most important implication of this study for EFL students and teachers is that the reading strategies that the subjects used were limited.

This implies that since reading is a complex process, there is a need for teaching reading strategies and training students. Literature in the field of the relation between reading metacognition and reading comprehension resulted in that metacognitive instruction facilitates reading comprehension[31-32-33]. Livingston[31] introduced metacognitive strategy instruction as an approach to metacognition development. Such approach includes direct instruction (DI) which suggests that teaching students about metacognitive reading strategies improves their reading awareness, evaluation of strategies and academic performance[19]. Direct Instruction can be achieved by: 1) explaining and discussing the value of metacognitive reading strategies, 2) allowing time for learners to comprehend and practice the strategies so they become automatic, and 3) modeling on how to use the strategy. The researcher believes that instruction and modeling are important because appropriate application of strategies will enhance reading and encourage students to use similar strategies in the future. The researcher also believes that since it is not practical to train a class of 20 students, for example, in thinking aloud, modeling using strategies on the part of the teacher could be more effective. The teacher himself/ herself verbalizes a text in front of the class and trains students on how to think aloud,

and how to employ reading comprehension strategies effectively. Moreover, teachers should encourage their students to use and vary their strategies. Grabe[18] indicated that readers have to use a wide range of strategies in order to read efficiently. Grabe added that efficient reading strategies should be obtained through direct formal instruction. In addition to receiving direct instruction, students should practice applying the strategies in a variety of settings, in order to develop the knowledge and control elements that are necessary for metacognition[35].

Bauman, et. al[33], on the other hand, believed that "think-aloud" instruction is superior to direct instruction. They indicated that "think-aloud" is useful, interesting, rewarding and gives a glimpse of how the human brain works, and helps teachers to evaluate the role of reading comprehension. Thus training students in thinking aloud improves students' ability to monitor their comprehension while reading. They also believed that "think-aloud" training is important because the students may be unaware of their mental processing and may not be able to verbalize these processes to the teacher. A study by[37] on one hand showed that students who were asked to think aloud while reading had better comprehension than students who were not taught to think aloud. On the other hand, in this study it was noticed that although the two subjects read and verbalized three different texts, they almost used the same strategies and their use of strategies did not improve as they approached the third text. This implies that frequent strategy training is necessary and requires great effort. Strategy training can't be accomplished over one night. It must be done repeatedly, over long periods of time, using different texts and various chances for practicing and applying these strategies. Such a procedure might provide the students with opportunities to monitor and evaluate their thinking process.

Teaching reading strategies to EFL learners is, however; a very demanding task for teachers who need to be aware of the process of employing reading strategies in their classes. The teacher's role is to carefully explain and model to the students the reading strategies, ie, they should define the strategy to the students, tell them why they are using it, provide them with examples on how and when to use a certain strategy, and give them opportunities to practice the strategies. Alderson[11] believed that teaching reading strategies to students helps them become independent and strategic readers. For this purpose, reading curriculum should emphasize the integration of metacognition and strategies rather than teaching "decontextualized" and "disconnected" reading comprehension[33]. According to Paris et. al. integration of metacognitive strategies would create proficient readers who are aware of their comprehension

while reading, and can reflect on the thinking process after reading. Teachers should weave reading strategies training into regular classroom activities and make them a natural part of the learning process.

Conclusions

In order to study the metacognitive strategies employed by Arab students, two English majors were studied while reading English texts. The researcher used four procedures in order to collect data: "think-aloud" reports, interviews, comprehension tests and a questionnaire. The findings indicated that the subjects engaged in a variety of strategies that aided their comprehension of the texts. The most frequent strategies were, however, more local and mechanical, such as translation and repetition. Both subjects worked hard on verbalizing their thoughts in the "think-aloud" sessions. The findings also suggested that the use of multiple data-collecting procedures is helpful in identifying more and different reading strategies. The interviews, tests and the questionnaire complemented the "think-aloud" by providing some similarities and differences that could be attributed to the ability of the subjects to verbalize, the subjects emotional reaction, interest, text difficulty, individual differences and language proficiency. Using more than one method is recommended since only one method may not reveal some of the strategies that the study has revealed. For example, the interviews detected strategies such as skimming, translating and explaining confusion. The "think-aloud" alone was not capable of revealing ways for guessing meaning of difficult words. "Think-aloud" provided only one way of getting information about the strategies that the subjects used. In addition, the tests revealed points of text understanding and misunderstanding. Finally the questionnaire helped in revealing more reading strategies employed by the subjects, which however, didn't indicate that they were used by the subjects.

The bad reading strategies which the subjects used often should be considered and investigated in order to know the cause and solve the problem. The two subjects in this study were unable to employ effective reading strategies mainly because they were not aware of them.

Teachers can help their students recognize the power of using reading comprehension strategies for making learning quicker, easier and more effective. Teachers can help students identify their current reading strategies by mean of interviews, questionnaire, "think-aloud" protocols and diaries.

However, it is important to know that it is not sufficient to know about the strategies, but one must also be able to apply them.

However, a case study will not give quite adequate information since the number of participants is not representative. In order to give a complete picture on reading strategies of Arab students, more empirical research is needed in order to allow for generalizations. Future research should include the role of factors such as motivation, gender, cultural and educational background and language proficiency in metacognitive reading and instruction. It would also be beneficial to compare the metacognitive processes of L1 (Arabic) and L2 (English) in academic environment.

Metacognitive strategies are necessary for this rapidly changing world. These strategies will help students to solve the problems they face in successful ways. Teachers must help in establishing metacognitive situations that enhance strategy use through training and integrating of strategy instruction into classroom activities. The inclusion of metacognition in strategy training is important since metacognition helps students to be consciously aware of what they have learned and recognize situations in which it could be useful. The only way to help students become proficient readers is by motivating them to read, through a variety of reading materials that are familiar and meet the students' needs and interests.

Appendix (1)

Text 3

All that we really need to plot out the future of our universe are a few good measurements. This does not mean that we can sit down today and outline the future course of the universe with anything like certainty. There are still too many things we do not know about the way the universe is put together. But we do know exactly what information we need to fill in our knowledge, and we have a pretty good idea of how to go about getting it.

Perhaps the best way to think of our present situation is to imagine a train coming into a switchyard. All of the switches are set before the train arrives, so that its path is completely determined. Some switches we can see, others we cannot. There is no ambiguity if we can see the setting of a switch: we can say with confidence that some possible futures will not materialize and others will. At the unseen switches, however, there is no such certainty. We know the train will take one of the tracks leading out, but we have no idea which one. The

unseen switches are the true decision points in the future, and what happens when we arrive at them determines the entire subsequent course of events.

When we think about the future of the universe, we can see our "track" many billions of years into the future, but after that there are decision points to be dealt with and possible fates to consider. The goal of science is to reduce the ambiguity at the decision points and find the true road that will be followed.

Questions on text 3

1. According to the passage, it is difficult to be certain about the distant future of the universe because we

   (A) have too many conflicting theories

   (B) do not have enough funding to continue our research

   (C) are not sure how the universe is put together

   (D) have focused our investigations on the moon and planets

2. In line 15, the word "track" could best be replaced by which of the following?

   (A) band

   (B) rails

   (C) path

   (D) sequence

3. For whom is the author probably writing this passage?

   (A) Train engineers

   (B) General audiences

   (C) Professors of statistics

   (D) Young children

4. What does the author see as the function of the universe's unseen "switches"?

   (A) They tell us which one of the tracks the universe will use.

   (B) They enable us to alter the course of the universe.

   (C) They give us information about the lunar surface.

   (D) They determine which course the universe will take in the future.

5. Which of the following statements best describes the organization of the passage?

   (A) A statement illustrated by an analogy.

   (B) A hypothesis supported by documentation.

   (C) A comparison of two contrasting theories.

   (D) A critical analysis of a common assumption.

   (E)

Appendix (2)

Reading Strategy Awareness Inventory

Adopted from Miholic, V. (1994). "An inver\ntory to pique students' metacognitive awareness of reading strategies'." <u>Journal of Readind;38:2,84-86</u>

There's more than one way to cope when you run into difficulties in your reading. Which ways are best? Under each question here, put a check mark beside all the responses you think are effective.

1. What do you do if you encounter a word and you don't know what it means?
    _____a. Use the words around it to figure it out.
    _____b. Use an outside source, such as a dictionary or expert.
    _____c. Temporarily ignore it and wait for clarification.
    _____d. Sound it out.

2. What do you do if you don't know what an entire sentence means? .
    _____a. Read it again.
    _____b. Sound out all the difficult words.
    _____c. Think about the other sentences in the paragraph.
    _____d. Disregard it completely.

3. If you are reading science or social studies material, what would you do to remember the important information you've read?
    _____a. Skip parts you don't understand.
    _____b. Ask your self questions about the important ideas.
    _____c. Realize you need to remember one point rather than another.
    _____d. Relate it to something you already know.

4. Before you start to read, what kind of plans do you make to help you read better?
    _____a. No specific plan is needed; just start reading toward completion of the assignment.
    _____b. Think about what you know about the subject.
    _____c. Think about why you are reading.
    _____d. Make sure the entire reading can be finished in as short a period of time as possible.

5. Why would you go back and read an entire passage over again?
    _____a. You didn't understand it.
    _____b. To clarify a specific or supporting idea.
    _____c. It seemed important to remember.
    _____d. To underline or summarize for study.

6. Knowing that you don't understand a particular sentence while reading involves understanding that

_____a. the reader may not have developed adequate links or associations for new words or concepts introduced in the sentence.

_____b. the writer may not have conveyed the ideas clearly.

_____c. two sentences may purposely contradict each other.

_____d. finding meaning for the sentence needlessly slows down the reader.

7. As you read a textbook, which of these do you do?

_____a. Adjust your pace depending on the difficulty of the material.

_____b. Generally, read at a constant, steady pace.

_____c. Skip the parts you don't understand.

_____d. Continually make predictions about what you are reading.

8. While you read, which of these are important?

_____a. Know when you know and when you don't know key ideas.

_____b. Know what it is that you knew in relation to what is being read.

_____c. Know that confusing text is common and usually can be ignored.

_____d. Know that different strategies can be used to aid understanding.

9. When you come across a part of the text that is confusing, what do you do?

_____a. Keep on reading until the text is clarified.

_____b. Read ahead and then look back if the text is still unclear.

_____c. Skip those sections completely; they are usually not important.

_____d. Check to see if the ideas expressed are consistent with one another.

10. Which sentences are the most important in the chapter?

_____a. Almost all of the sentences are important; otherwise, they wouldn't be there.

_____b. The sentences that contain the important details or facts.

_____c. The sentences that are directly related to the main idea.

_____d. The ones that contain the most details.

Appendix (3)

Questions on text 1

1. The paragraph that precedes this passage most probably deals with
   (A) minor diseases other than colds
   (B) the recommended treatment of colds
   (C) a factor that affects susceptibility to colds
   (D) methods of preventing colds among elderly people

2. Which of the following is closest in meaning to the word "particulars" in line 2?
   (A) minor errors
   (B) specific facts
   (C) small distinctions
   (D) individual people

3. It may be inferred from the passage that which of the following groups of people is most likely to catch colds?
   (A) Infant boys
   (B) Young girls
   (C) Teenage boys
   (D) Elderly women

4. There is information in the second paragraph of the passage to support which of the following conclusions?
   (A) Men are more susceptible to colds than women
   (B) Children infect their parents with colds
   (C) People who live in a cold climate have more colds than those who live in a warm one.
   (D) People who don't have children are more susceptible to colds than those who do.

5. The phrase "in this age group" (line 8) refers to
   (A) Infants
   (B) people in their twenties
   (C) people in their thirties and forties
   (D) elderly people

6. The author's main purpose in writing the last paragraph of the passage is to
   (A) explain how cold viruses are transmitted
   (B) prove that a poor diet causes colds
   (C) discuss the relationship between income and frequency of colds
   (D) discuss the distribution of income among the people in the study.

7. The author's tone in this passage could best be described as
   (A) neutral and objective
   (B) humorous
   (C) tentative but interested
   (D) highly critical

Questions on text 2

1. From the passage, which of the following can be inferred about pigeons?

   _____(A) They can show the same emotions humans can.

   _____(B) They can understand human emotions.

   _____(C) They can only identify the expressions of people they are familiar with.

   _____(D) They have more sophisticated nervous systems than was one thought

2. The passage implies that, at birth, human babies

   _____(A) have nervous systems capable of recognizing subtle expressions.

   _____(B) can learn from pigeons

   _____(C) are not able to recognize familiar faces

   _____(D) may not be able to identify basic emotions through facial expressions

3. Why does the author mention the experiments conducted several years ago at the University of lowa?

   _____(A) They proved that pigeons were not the only kind of animal with the ability to recognize facial expressions

   _____(B) They were contradicted by more recent experiments

   _____(C) They proved that the ability to recognize human expressions was not innate in human babies.

   _____(D) They showed the similarities between the mental organization of pigeons and that of humans.

4. If Charles Darwin could have seen the results of this experiment, his most probable response would have been one of

   _____(A) rejection

   _____(B) surprise

   _____(C) agreement

   _____(D) amusement

5. "subtle" line 9 probably means":

   _____(A) Very surprising

   _____(B) Not easy to describe

   _____(C) Easy to recognize

   _____(D) logical

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