COGNITIVE CONSIDERATIONS IN TEACHING READING COMPREHENSION

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ABSTRACT

The role of cognitive psychology in the process of learning has been confirmed by both linguists and psychologists. Teaching Reading Comprehension needs some cognitive considerations since students apply many cognitive processes or strategies like memorization, inference, monitoring, generalization, etc. In the present study, the role of Short-Term Memory (or STM) and Long-Term Memory (or LTM) has been studied to trace how information can be transferred from STM to LTM; student's application of cognitive strategies has been focused on; and some cognitive activities used in the teaching of this course are stated. The research has an Introduction and three sections. Many concluding points are also mentioned.

1- Introduction

In recent years there has been increased focus on the teaching of reading; current research generally views reading as an interactive, socio-cognitive process "***involving a text, a reader, and a social context within which the activity of reading takes place***"(Ediger,2001:154).An individual constructs meaning through a transaction with a written text that has been created by symbols that represent language .The transaction involves the reader's activity in interpreting the text, and the interpretation itself is

influenced, as stated by Ediger(ibid.),by the reader's past experiences, language background, and cultural framework, as well as the reader's purpose for reading. That is, the ability to read requires that the reader draws information from a text and combines it with information and expectations that the reader already has. This interaction, as mentioned by Grabe & Stroller (2001:188), is a common way to explain reading comprehension.

As mentioned in all language teaching and learning books, structural linguists adopted the behaviorist theory of learning that views language learning as habit formation (Richards & Rodgers, 1986:50-51). The only processes that the learner is expected to use are mechanical memorization and mimicry of teacher or textbook input, which is to be produced in exactly the same form. Learning takes place in a linear way. What has been already learnt is not related to what comes next. Generative linguistics, however views learning as a cognitive activity, thus, relating learning to thinking and discovering. Although Chomsky has disclaimed any prescription for foreign language teaching and his grammatical description has little application in classroom teaching, his idea of "**Generative Principle**" has led to the appreciation of the creative aspect of the use of a language; Chomsky's formation of a theory confronted the complexities of language and psychology. As George (1972:80-81) puts it, TGG ***"invites out attention to operation and processes thus, suggesting links (1) between grammar and the psychology of the use of language, and (2) between grammar and the psychology of language learning"***. Chomsky himself describes the importance of the practical application of the **cognitive psychology**[1] of learning in the second and foreign language classroom as follows:

> ***My own feeling is that from the knowledge of the organization of language and principles that determine language structure, one cannot immediately construct a teaching program. All we can say is that a teaching program be designed in such away as to give free play to those creative principles that human beings bring to the process of language learning, and I presume to the learning of any thing else***(cited in George,ibid.:83***).***

Although cognitive psychology has found its way into the classroom only recently, cognitive theories[2] dominate the field of language learning today (Donahoe & Wesselle, 1980). This leads the researcher to state that the role of cognitive activities in reading is evident, and focusing on this issue is important.

The present paper aims at shedding some light on some cognitive consideration in teaching the course of Reading Comprehension to second year

students, Department of English, College of Education, and University of Wassit. The used textbook is **Sixty Steps to Précis** (by L.G. Alexander, 1962). These cognitive considerations are the psychology of the learning process, memory and the implication of cognitive strategies in the classroom as learning strategies, and some cognitive activities applied in the classroom to develop the students' mental performance in this course.

2- The Psychology of the Learning Process

The psychology of language is concerned with the mental processes by which people understand and speak, and thus, are taken into account by language learning theory. McEldowney (1976, 1992) in her language learning theory, recently known as **Discourse-Based Approach**[3] to language learning and teaching, states that the syllabus designer and the teacher need to take into account certain psychological factors in designing and presenting their learning materials. Central are the factors of memory, repetition and motivation.

Receiving and storing information, thinking and repetition all play a part in the learning process. In order to understand how these processes affect learning, it is necessary to describe two things: the relationship between memory and learning, and how memory works as a processor. Donahoe and Wesselle (1980:409) describe the relationship between memory and learning stating that learning and memory are in fact different aspects of the same phenomenon. Remembering involves retaining the effects of experience over time. Similarly, learning involves retention over time, for learning is said to occur when the events that take place at one time during an organism's life influence the behavior of that organism at some later time. Thus, memory is implicit in all learning....

> ***To go one step further, memory is necessary for learning. There could be no learning if there were no memory, for the effects of experience could not carry over from time to the next. Since memory is an important part of learning, we must seek to understand memory in our attempt to gain a comprehensive understanding of learning*** (ibid.).

Therefore, one aspect of memory and learning is the retention of the information over a period of time. Clark and Clark (1992:133) and Ellis (1986:108) confirm this idea stating that memory is the place for storing, retrieving and organizing information[4]. They go further to state the factors that affect memory:

- ☒ ***Type of language***: was the passage, an ordinary conversation, formal lecture, a play, a poem, or a list of unrelated sentences in a psychological experiment?

- ***Input***: did we hear it passively? Try to memorize it word for word, listen for the gist only, or listen for nothing but grammatical errors?
- ***Retention interval***: did we hear it a moment ago or a year ago?
- ***Output***: are we trying to recall it verbatim or orally trying to decide for a test sentence, whether or not it was what we had originally heard?

The above factors affect the content, quality and the accuracy of the information that we try to remember. Fostos (2001:268) points out that "remembering is often said to be a reconstructive process. People remember passages by piecing together what information they can retrieve (ibid.:270-74).He identifies three stages for remembering: **input, storage** and **output** .

We infer that cognitive psychologists view memory as a processing system of two levels, namely **short-term memory** (or STM) and **long-term memory** (or LTM). STM is a place for brief periods of time. Words can be maintained there only through active rehearsal and are otherwise lost very rapidly. LTM, on the other hand, is the place where more permanent information is stored. It deals generally with meaning rather than sounds, and for all practical purposes it has unlimited capacity (Garman, 1990: 309,322).

3- Memory

Related to McEldoweny's theory of learning[5], four questions can be raised:

- What do students retain: verbatim wording or meaning?
- How much information can be retained or stored?
- How can information stored in STM be transferred into LTM?
- What type of discourse can be easily retrieved?

Activities inside the classroom like speed reading, repetition and dictation, and memorization show that students were good at verbatim recognition immediately after hearing a sentence and poor thereafter. Yet they remain relatively accurate in detecting gross changes in meaning. This means that students retain verbatim wording for STM, since they retain information for a short period of time then lose it, but in LTM, students retain meaning over longer periods. The researcher has found that the shortest period for verbatim wording is no more than five to ten minutes, and will be thirteen when the word is written on the board while the longest period is a full 50-minutes lecture. This is done by mentioning certain words and the researcher tried to ask his students about these words from time to time. Registration was done each lecture .This activity was repeated at least 16 times till the researcher was able to reach this finding. On the other hand, the shortest and the longest periods of retaining meaning are 50-minutes lecture and two weeks, respectively. The same procedure was done. But the time was two months. Detecting changes in meaning shows that students do not store information word by word or store the exact meaning (see also Clark & Clark, 1992:134).Earlier, George (1972:5), as

a cognitivist, describes what is stored in terms of the selection of particular features:

> ***since there is a time gap between input and output ,there must be storage of information or memory. However simple observation tells us that the black box (i.e., the brain) does not store the total input: features are selected for storage.***

Imssalem(2001:173)states that the efficient information collector needs to give selective attention ,not pondering over each word but taking in whole meaning groups rapidly ,selecting from them what is relevant. In doing Précis, students were able to affirm this conclusion: they retain and store information that they think is relevant to the point of communication. The researcher has noticed that this retaining and then storage is relative , depending on the type of discourse. The textbook **Sixty Steps to Précis** (by L.G. Alexander, 1962).is of four types of discourse: descriptive, narrative, instructive, and argumentative. The same order reflects the relative degrees of storage .The techniques used are memorization, brainstorming, and précis writing. Psycholinguists, like Clark &Clark (op.cit.) and Donahoe & Wessells(1980:475),argue that active rehearsal is important to ensure that information is retrieved in LTM. Therefore, the researcher has found that the simplest procedure is to keep rehearsing or repeating information again and again. Both types of rehearsal are applied: maintenance rehearsal and elaborative rehearsal. Maintenance rehearsal involves processing information at a particular level and does not facilitate long-term recall. In contrast, elaborative rehearsal involves organizing the repeated information and fitting it in with the information from past experience, and elaborative rehearsal improves long-term retention (Donahoe & Wessells, ibid.).Students needed between thirteen to twenty three times to transfer what is stored in STM to LTM. This means that at least a word or a particular sentence is repeated between thirteen to twenty-three times. Two factors were important in these repetitions, namely, the types of discourse and the structures of the sentences. In this respect, the researcher has seen that students are able to recall and to store related sentences, paragraphs and coherent discourse better than unrelated sentences or paragraphs. Also, words in coherent, simple –structured discourse can be recalled and stored easier than alone. Motivation is one of the important elements in learning: repetition requires attention and attention requires effort. Learners make an effort when they are given the chance to do so and also when they are interested in the lesson. Since the most obvious source of motivation in the classroom is the learners' interest in the learning material itself, the researcher has noticed that the students were more motivated when they are asked to gross meaning and when they are rewarded.

The researcher has realized that memory is one of the cognitive variables which may govern students' learning. The other variables are

intelligence and mental activities that students use inside the classroom, since outside the classroom is not directly controlled by the teacher. In this respect, Richards, et. al. (1992:62) add that there are effective variables: attitude, emotion, motivation, personality, etc.

The researcher has also realized that students are relative in their prediction (of words or meaning).The title of the passage and the pictures on the right hand usually carry a lot of information about the passage. If students pay attention to these features, they can choose what they want to read more effectively (see Day, 1993:; 27-31).The researcher has also noticed that students apply two sources of information relatively. These are regularity and the application of previous knowledge. Students under study are asked to:

- ✓ suggest a suitable title to the passage, of course, with his/her justifications.
- ✓ find a word of similar meaning in the same passage, or in the previous passage(s), if possible.
- ✓ make a list prefixes, suffixes, confusing pairs, etc.
- ✓ make a direct check of the forms which native speakers use at specific points.
- ✓ use their dictionaries powerfully.
- ✓ make an inventory or statistical survey of a particular morpheme, word, sentence, or tense.
- ✓ find the contextual associations of an item.
- ✓ connect the concepts and ideas of the passages.
- ✓ learn the procedure to know the type of the discourse.
- ✓ increase their exposure to a variety of reading and vocabulary materials.
- ✓ comment, as much as possible, on the cultural consideration of the passage.

The following diagram can sum up this long journey (suggested by the researcher):

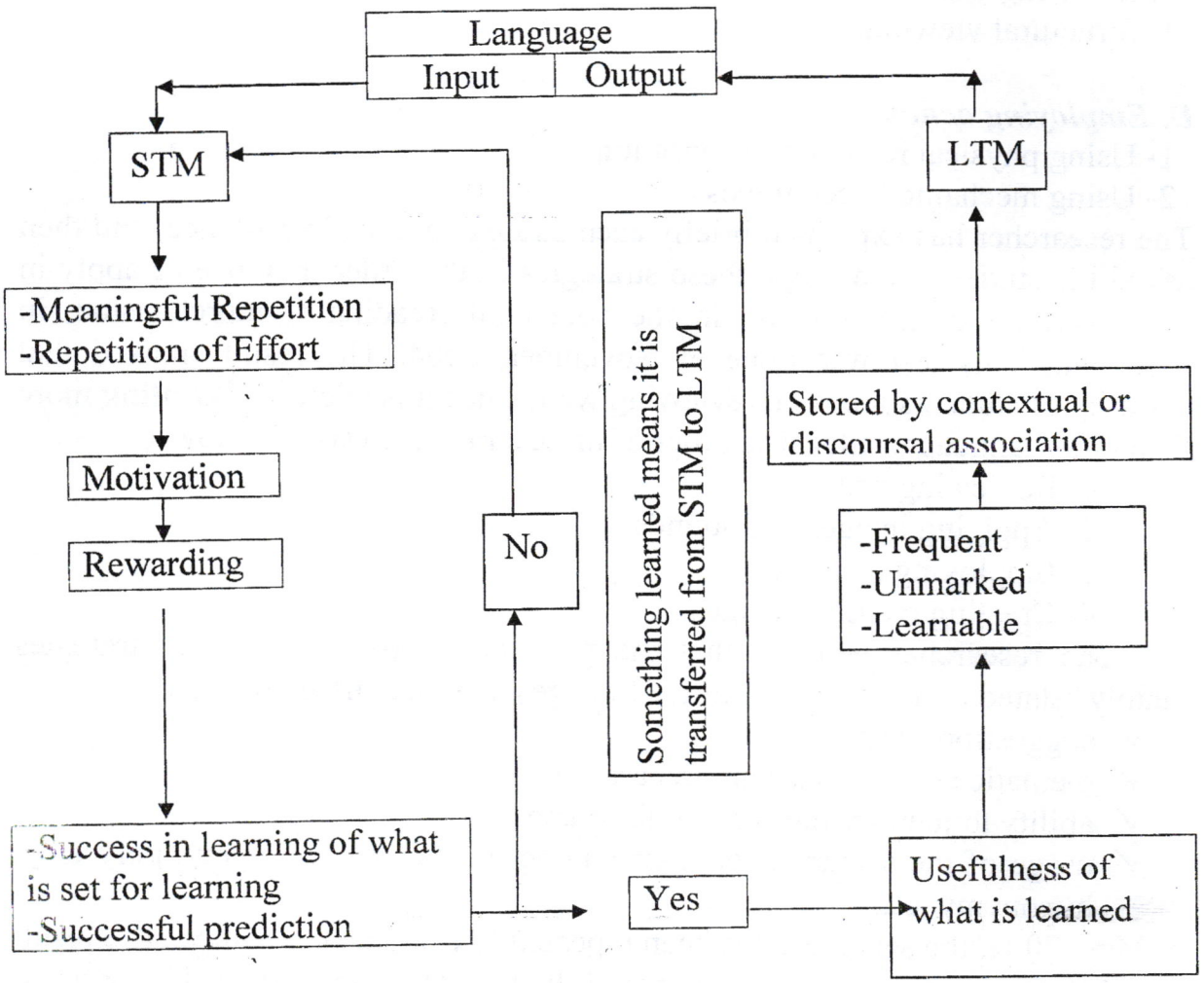

Diagram: The Transfer of Information from STM to LTM.

The researcher has introduced his students to Oxford's classification of **Memory Strategies**. R. Oxford has classified Memory Strategies as follows (Brown, 2000:132):

Memory strategies

A. Creating mental linkages

1- Grouping.
2- Associating/elaborating.
3- Placing new words into a context.

B. Applying images and sounds

1- Using imagery.
2- Semantic mapping.
3- Using keywords.
4- Representing sounds in memory.

C. Reviewing well

1- Structural viewing.

D. Employing action

1- Using physical response or sensation.
2- Using mechanical techniques.

The researcher has explained briefly each strategy and its importance, and then asked his students to arrange these strategies in the order they use or apply in their learning in general and in the course of Reading Comprehension, in particular. This test was done in November, 2004. The result showed that majority of students focus on reviewing well, since it is related to **Writing** more than other language skills. The order of these strategies was as follows:

1- Reviewing well.
2- Applying images and sounds.
3- Employing actions.
4- Creating mental linkages.

The researcher believes that the poor performance, in those strategies mainly related to mental or cognitive linkages, has also affected their:

- ✓ suggestion of titles.
- ✓ thematic connections among passages.
- ✓ ability to identify the type of discourse.
- ✓ usage of the semantic relations among words like synonymy, polysemy, hyponymy ,etc.

In May, 2005, the same test has been repeated to evaluate the course. The result was different since students are aware of the lexical technicalities. The order of the second test was:

1- Creating mental linkages.
2- Reviewing well.
3- Applying images and sounds.
4- Employing action.

This result led the researcher to realize that:

i- Students have made a kind of progress in their prediction, especially the application of previous knowledge.
ii- Students apply both cognitive strategies more than metacognitive ones.
iii- Students have different cognitive styles.[6]

The researcher has seen that the following cognitive styles are used by his students:

a- some need further explanations for grammatical rules.
b- Some may need more examples to illustrate a particular usage.

c- Some may feel writing down words or sentences on their papers or the blackboard helps them to remember them.
d- Some may remember things if they are associated with pictures.
e- Some need reading the passage done at least three times.

The researcher has found that the following cognitive strategies are of frequent use by students[7]:

1-- Repetition
2- Memorization
3- Translation
4- Imagery

While the less- frequent ones are:

1- Recombination
2- Contextualization
3- Elaboration
4- Deduction

On the other hand, three metacognitive strategies are use:

1- Self-evaluation
2- Directed attention
3- Selective attention

4- Cognitive Activities Used

Many reasons led the researcher to focus on cognitive aspects or considerations rather than others:

- ✓ The main task in this course is to write précis, which in turn requires basic cognitive techniques, like thinking, summarization, and recombination.
- ✓ Constant lack of recent textbooks, and the low quality of the available ones. Students had been given books with fully-answered questions.
- ✓ Students believe that the main purpose of the Reading Comprehension course is to read and give meaning. In other words, no place for cognitive activities and thinking is available.
- ✓ Students are of heterogeneous society since many primary-school – teachers are studying in the department..
- ✓ Students lack the basic skills of English.
- ✓ No good use of dictionary. Only four students have bulky English-English ones.
- ✓ The number of students inside the classroom is 57; this big number leads the teacher to select a method that can coordinate with this big number.
- ✓ No audio-visual aids inside the classroom.
- ✓ There is a kind of being unsatisfied by studying related courses like psychology in the English Dept.

These factors led the researcher to focus on the following cognitive activities.

- ✓ suggesting titles.
- ✓ Brainstorming.
- ✓ oral debates.
- ✓ puzzles related to dictionary use.
- ✓ strategic reading.

Certain steps are adopted before involving in the purpose of the course, namely, to develop students' mentalities:

- ✓ Students are gradually introduced to the importance of thinking and remembering on the four skills of language: reading, writing, understanding, and listening.
- ✓ Simple cognitive exercises are introduced in the first five minutes each lecture on the form of a question, a puzzle, a concept, etc. the rest of the lecture will consolidate and emphasize a particular cognitive process or strategy.
- ✓ A particular cognitive strategy may take more than one week.
- ✓ Students are given chances from time to time to raise a concept, an idea that may lead the class to tackle it in general. In this respect, those students are rewarded as a kind of motivation. Students involved in such experiences are also rewarded.

1- Suggesting Titles

The following points are registered:

i- Majority of students agree that a title should sum up the theme of the passage, and suggesting a suitable one needs time and thinking.

ii- In all lectures, rapid understanding occurred in its two forms: positive (when the suggested title is correct) and negative (when incorrect).

iii- Understanding and mastering the topic sentence and its controlling idea(s) led students to suggest a correct title. Some students, as seen in a high percentage, use the same words of the topic sentence.

iv- This activity has focused on the following cognitive processes: inference, deduction, summarization, and reviewing.

v- Some students were able to suggest more than one correct title. They justify that the passage has two coordinated themes.

2- Brainstorming

This is often a group exercise in which all students in the class are encouraged to participate by sharing their collective knowledge about the passage, in general, and its topic, in particular. The following points are registered:

i- Brainstorming generates far more material than any one student is likely to think in his/her own.

ii- Students will be more able to utilize any or all the information when turning to be preparing.

iii- By comparison, students are able to present written brainstorming better than oral brainstorming due to shyness.

iv- In this course, frequent comparison between oral brainstorming and oral brainstorming are done to emphasize both skills: reading and writing.

v- Oral brainstorming is done by giving students 10 minutes to think about a topic ,then present their ideas and suggestions individually. Topics were TV Programmes, English Language, and life in the department, your grand mother, etc.

vi- Students, in written brainstorming are more random since they move their thought from one topic to another. In oral brainstorming, students are less random focusing, in a great extent, on two topics each time.

vii- The same topic will be repeated from three to four times (or lectures) to evaluate their mental development. Usually at the third time students were able to avoid their hesitation and, then, present their topics orally, in a way completely different from the first time.

viii- The researcher concluded that students' writing skill overweigh their speaking skill.

ix- Majority of the cognitive and metacognitive mentioned above are evaluated.

3- Strategic Reading

The researcher noticed the following points:

i- When students introduced to the importance of strategies in Reading Comprehension, their practice, and their use, certain exercises must be done to be good strategic readers.

ii- Students fortunately have a good range of strategies at their disposal, but they need more practice in applying these strategies in efficient combinations.

iii- The researcher tried hard to apply the steps suggested by Grade & Stroller (2001:195),and these are:

a- previewing a text
b- predicting what will come later in a text
c- summarizing (or writing précis)
d- learning new words through the analysis of word stems and affixes
e- using context to monitor comprehension
f- recognizing text organization
g- generating appropriate questions about the text
h- clarifying text meaning
i- repeating microcomprehension

Conclusions

The main findings of the present paper are:

1- Students are really able to implement many cognitive processes in the course of Reading Comprehension. These are really related to their ability to understand the content of the text and its references.
2- The three stages of remembering (input, storage, and output) is the main stream of psychological treatment in learning a word, or even a large text.
3- STM and LTM are seen, and the transference from STM to LTM takes at least 13 times (the same word has been repeated 13 times till it becomes one of the student's stock of vocabulary).
4- Students are relative in their prediction; they apply two sources of information: regularity and the application of previous knowledge (a pragmatic consideration).
5- Students can be developed to be strategic readers if they are trained well to apply learning strategies. Students .by heavy work and continuous control, are able to modify their strategies. The relatively - applied cognitive strategies are repetition, memoriza- tion, translation, imagery, recombination, contextualization, elaboration, and deduction. The metacognitive ones are self evaluation, directed attention, and selective attention.

Notes

1- Cognitive psychology is a branch of psychology which deals with the study of the nature and learning of systems of knowledge, particularly these processes involved in thought, perception, comprehension, memory and learning. In recent years, as mentioned in Richards, et.al.(1992:60), cognitive psychology has been related to mentalistic approaches to linguistics, especially Chomsky's TGG which links language structure to the nature of human cognitive processes. See also McDonough (1986, ch.3).
2- In spite of the contribution of cognitive psychology to Chomsky's TGG, Cook & Newson (1996:31) state that cognitive theory of learning is in contrast to Chomsky's universal grammar model of language learning since the former views the mind as a single unitary system whereas the latter divides the mind into separate compartments.. His usual argument is that whatever else cognitive development can account for, it cannot explain the acquisition of language knowledge, as no one has proposed a precise way in which principles such as **structure dependency** are acquired.
3- See Imssalem(2001).
4- See Ellis (1986:108) for the distinction, or differentiation between children's cognitive development and older learners's cognitive development. Also see Cook & Newson (1996:121).
5- See McEldowney (1992, ch.2).

e- Cognitive style is the particular way in which a learner tries to learn something.

6- For a detailed study and application of strategies-based instruction, see Brown (2000:ch.5) and Oxford (2003:359-67).

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