CALL in the Reading Class: Impact on ESL/EFL Learners' Cognitive Development

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RESUME

Le CALL[1] est de plus en plus utilisé dans les classes de langue pour enseigner les habiletés langagières en général, et la compréhension en particulier. Bon nombre d'études ont montré les avantages du CALL pour le développement des habiletés cognitives des apprenants pendant le cours de compréhension. Cependant, il y a quelques soucis liés à la manière dont se fait ce développement. Cet article scrute cette question en vue de faire la lumière sur la façon dont le CALL impacte le développement cognitif de l'apprenant dans le cadre de la compréhension de texte. Notre préoccupation principale est la suivante : Considérant les caractéristiques du CALL, et compte tenu des soucis liés à sa mise en œuvre dans les classes de compréhension de texte, comment pourrait-on accroitre la capacité cognitive des apprenants ? Notre démarche a consisté à expliquer d'abord le model cognitif de la compréhension. Ensuite, nous avons évoqué les implications du CALL pour l'enseignement de la compréhension. Enfin, nous avons proposé de nouvelles perspectives du CALL pour développement effectif des habiletés cognitives des apprenants.

MOTS CLES : CALL, compréhension de texte, habiletés cognitives, apprenants de l'anglais langue seconde/ étrangère.

ABSTRACT

CALL is being used increasingly in EFL/ESL classrooms to teach language skills in general and reading in particular. Many studies have shown CALL's positive impacts on the development of learners' cognitive skills in the reading class. However, there are still some shadows on how this development actually happens. This paper sheds light on the way CALL impacts learners' cognitive development during reading classes. Our main preoccupation is as follows: considering CALL features and taking account of its implementation in the reading class, how can learners' cognitive skills be improved? The article proceeds by first accounting for the cognitive model of

reading. It then addresses the implications of CALL for the teaching of reading. Finally, the paper suggests new perspectives of CALL for an effective development of learners' cognitive abilities in the reading class.

KEY WORDS: *CALL, reading comprehension, cognitive skills, ESL/EFL learners.*

INTRODUCTION

Second/foreign language teaching and learning has undergone huge upheavals over the past few decades. This is due to factors such as the promotion of learner-centered approaches, the increasing needs of learners to use the target language in their daily communication and, more importantly, the advent of communication and information technologies (ICTs) in teaching practices. ICTs play an outstanding role in teaching language skills in general, and reading in particular. According to the members of National Council of Teachers of English (NCTE 2008), global economies, new technologies and exponential growth in information are transforming our society in ways that prompt new literacy (reading and writing skills) that are central to individual and community success. Further, they add that in order to prepare their students for success in school and society, language teachers are required to expand the classical understanding of reading to encompass the new literacies that are emerging (idem, 2008). Electronic literacy skills, and the ability to find, organize and make use of information using computers are part of life for many in the developed world, and the use of computers for teaching reading is being increasingly demanding (Shetezer and Warschauer, 2000: 173). Now, the debate on the use of computers in the reading class must not be about ''should'' but ''how'' can the computer be best used ''to teach reading skills''? (Chapelle, 2000:1). Indeed, many studies (Kledecka, 2000; Shayester, 2015; Ahangari, 2013) have shown CALL positive impacts on the development of learners' cognitive skills in the reading class. However, there still are

some shadows on how this happens actually. The existing studies on the issue seem to be at theoretical level. No pragmatic evidences are provided about how computer can effectively foster learners' cognitive skills in the reading class. This paper aims at examining the extent to which CALL can actually increase learners' cognitive abilities during reading activities. My concern is as follows: Considering CALL characteristics and given the worries relating to its implementation in the reading class, I wonder how it can effectively help learners develop their thinking abilities. In order to provide an answer to this question, the paper will first account for the cognitive theory of reading. CALL implications for the teaching of reading will be addressed. Finally, some suggestions will be made for the improvement of learners' cognitive abilities during the implementation of CALL in the reading class.

1. COGNITIVE MODEL OF READING

From the 17th to the 19th century, the reading instruction was based on learners' oral capacity, indexed either by accuracy or expressive fluency. Comprehension arrived as a model of reading competence and performance in late 20th century (Pearson, 2000: 152-208). Thorndike was probably the first educational psychologist to launch an inquiry into the complex thought process associated with comprehension. He regarded reading as '' reasoning'' and ''suggesting'' that comprises many factors: '' elements in a sentence; their organization… proper relations, selection of certain connotations and the rejection of others, and the cooperation of many forces''. (Thorndike, 1917: 323). Further, he asserted that understanding a paragraph is like solving a problem in mathematics. It consists in selecting the right elements in the situation and putting them together in the right relations, and also with the right amount of weight or force of each (idem, 329). Indeed, reading a text from a cognitive perspective requires that learners develop both simple and complex interpretation habits. The simple ones include concentrating attention on the content, associating meaning with symbols, anticipating the sequence of ideas, associating ideas together accurately, and recalling related experiences. The complex interpretation habits deal with analyzing and selecting meaning, associating and organizing meaning, evaluating meaning, and retaining meaning (Gray, 1925). Such

interpretation is facilitated by learners' background knowledge. Comprehending a text is an interactive process between this knowledge and the text. (Barrlett, 1932; Adams and Collins, 1979; Rumelhart,1980, cited in Shuying, 2013). In fact, the reader's background knowledge and linguistic cues contained in the text are organized into interrelated patterns which are made use of in reconstructing meaning (Nunan, 1995: 68). For Nunan, the reader makes connections which do not exist in the text, but which are provided by his previous knowledge activated by linguistic cues. The reader is considered as a ''builder'', an active meaning constructor, an aggressive processor of language and information who filters the raw material of reading through his vast reservoir of knowledge to continuously revise a dynamic ever-emerging model of text meaning (Anderson, 1977; Collins, Brown and Larkin, 1980). While reading a text, the reader can make assumptions about its content and predict what will happen, on the basis of his background knowledge. That is, the reader makes inferences, builds his/her own meaning, and makes his /her own interpretation of the text that may be different from the writer's.

2. COGNITIVE MODEL OF READING IN THE CALL CLASS

2.1. DEVELOPMENT OF COGNITIVE SKILLS

CALL software such as e-dictionaries, hyperlinks and mainly concordancers[2] help

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[2]concordancer is a piece of software, either installed on a computer or accessed through a website, which can be used to search, access and analyze language from a corpus. They can be particularly useful in exploring the relationships between words and can give us very accurate information about the way language is authentically used.

learners develop cognitive skills during reading activities. With concordancer for
instance, learners can develop their ability to observe, speculate, and identify patterns in the target language (Johns, 1988). The output of concordancer researches presents learners with authentic, actual choices that language users make and allows them to explore and discover ordinary patterns of words or sentence usage in various styles. Consequently, the capability of contextual inference can be substantially enhanced by providing multiple contexts for a given word with computer system (Cobb, 1997, 1999). Besides, EFL researchers suggest that pictorial introductions as a pre-reading activity can facilitate high-level inferences that help readers link

disparate ideas found in the text. Anstey and Freebody (1987) showed the evidence with fifth-graders who favored pictures as a pre-reading activity, compared to groups of students asked to answer a set of comprehension questions or to complete an unrelated control task. In addition, the students who received pictorial instructions performed best among the four groups on a measure of comprehension. Kim and Kamil (2002) considered the beneficial effects of the ways of presenting texts through electronic application as unique, which cannot be compared with conventional printed texts. Indeed, presenting information by using different kinds of media such as video or multimedia texts may have significant effects on comprehension (Ahangary, 2013). The dynamic nature of multimedia presentation is proved to have a greater impact on both retention and comprehension than static images. For instance, when verbal and visual information was integrated and presented with multimedia presentation, reading comprehension improved to a great extent (Mayer and Moreno, 1998 cited in Kim and Kamil ,2002). In addition, within the multimedia environment, visual and auditory information is added to the text in order to improve comprehension (Chun and Plass, 1997). Reading comprehension being a complex process in second or foreign language learning, the use of sounds, animated pictures or video plays an important role in vocabulary acquisition and text comprehension (*idem*, 2013). Moreover, several early studies assessed reading comprehension of print and computer-mediated texts with the intention of clarifying factors of computer presentation of text which facilitate reading comprehension (e.g. definitions of key concepts, access to background information, technical features of layout and organization) (Reinking, 1988).

However, recent reviews (Destefano and Lefevre, 2007) have shown that CALL texts structure tends to increase cognitive demands of decision making and visual processing and this additional cognitive load, in turn, impairs reading comprehension performance (Mangen, Walgermo, Bronnick, 2013). For them, CALL based reading does not necessarily entail increased cognitive load. Some studies (Carr, 2010) suggested that computer software hinder reading because they are a distraction likely to have negative effects on reader's ability to process a text. Others (Fitzsimmos, Weals, Drieghe, 2014) have showed CALL's negative impacts on learners' cognitive development as compared with the conventional printed texts. For instance, a study (Rice, 1994) employed two measures to examine reading comprehension of short texts (142 words): a text recall measure and a highlighting task (in order to examine reading comprehension in a so-called (''interactive mode''). The findings revealed no significant effect for presentation mode (screen or paper) on the recall measure. However, on the interactive measure, a significant main effect was found for presentation mode, with paper being significantly better than computer. The authors concluded that reading comprehension constructs appear to be the same between computer presentation and paper presentation of text, but when readers engage in a highlighting task, a significant effect is found for presentation medium (paper over computer) performance (Mangen, Walgermo, Bronnick, 2013). In fact, there is still a debate around CALL impact on the improvement of learners'

cognitive skills in the reading class. Some studies have revealed CALL benefits on learners' cognitive skills. Others have rather stressed on its distracting and disruptive impacts. This may be due to the fact that most language teachers consider computer software as mere teaching aids used just to present their courses. No much emphasis is put on how CALL can actually allow learners develop cognitive skills by completing reading activities. Teachers seem to limit CALL's role only to the replacement of printed texts by hypertexts that learners read through the computer screen. CALL's potentials for improving learners' cognitive skills are under exploited. CALL is rather ''an approach to language teaching and learning in which computer technology is used to present, reinforce and assess the teaching content, usually including a substantial interactive element Fidelman (1998). From this perspective, CALL should provide learners with opportunities to acquire higher levels of text understanding through the development of cognitive skills such as inferential skills, problem solving skills critical thinking and metacognitive skills, among other considerations.

2.2. INCREASING INFERENTIAL SKILLS

CALL first impact on readers' cognitive development is its ability to increase their inferential skills with visual aids. The use of visual aids such as animated pictures and video in pre-reading activities enables learners to activate their cognitive load and connect it to the content of the picture in order to guess its implications for the reading text. This leads them to infer general information (theme, general idea) as well as detailed information (specific information in each paragraph) about the text to be read. In doing so, learners anticipate on reading skills such as skimming and scanning. Let's provide a practical example. Before starting reading comprehension lesson on the drawbacks of earthquake, the teacher can first make learners watch a video about the earthquake that took place in Japan in 2011 as a pre- reading activity. From the video, learners will be able to account for the earthquake and to list its drawbacks without reading the text.

Such an activity can act up learners' cognitive development in two ways: Firstly, additional stimuli and new ideas will get integrated into their pre-existing cognitive schema, a process Piaget called ''assimilation''. Students will learn new information about earthquake and add them to their old knowledge database. Secondly, through reasoning, they will reorganize the entire database which results in altering the pre-existing schema in order to fit the new information. Known as ''accommodation'' process, this step is compulsory in learning to the extent that it allows learners to continuously interpret new concepts, schemas, and frameworks, etc.

2.3. DEVELOPING PROBLEM SOLVING SKILLS

With the promotion of new teaching approaches based on learners' construction of knowledge, language teachers are required to turn learners into problem solvers. CALL class provides them with the opportunity to develop such skills in reading. Computer-Assisted Reading (CAR) activities should be designed in such a way that they enable learners to solve problems while completing them. They should be more challenging and, contain difficulties learners must overcome in order to achieve understanding. This can happen when learners are asked to complete a gap filling exercise after a reading session. A bank of words being provided, they click on the appropriate word for each gap to give the passage its full meaning. The challenge of such an activity consists in finding the right word for each gap before moving forward. Any time learners click on the wrong word, the computer cross it and suggest them to try with other words till they find the appropriate one before moving to next gap. The problem-solving skill developed by learners in this kind of activity is their ability to overcome the obstacle in each gap. Therefore, the computer becomes a mediating tool acting upon learners' zone of proximal development as explained by Vygotsky. That is, the distance between their actual development level as determined by independent problem-solving and the level of potential development as determined by problem solving under the computer's guidance.

2.4. ENHANCING CRITICAL THINKING SKILLS

CALL based reading texts are authentic texts, most of the time accompanied with pictures or videos which raise real world issues including socio- political, economic or cultural facts. Such texts foster learners' curiosity about these issues and while reading them, they develop critical thinking skills through analysis, interpretation and evaluation in order to make their own judgments, decisions, and build their own version of the truth. For instance, reading a text and watching a video about famine will enable learners to know how people are dying from famine in the world, they will have a critical view about it. And, after the reading session, the teacher can ask them to build projects about famine eradication in the world. Learners will provide solutions to eradicate famine by reflecting about its causes and impacts on world population before proposing solutions for its eradication. Besides, learners can develop an analytical reasoning that allows them to take positions, make decisions and defend their view during conversations, debates, conferences and the likes. As a result, CALL reading activities will turn learners into responsible citizens who contribute to the development of their society.

2.5. DEVELOPING METACOGNITIVE SKILLS

CALL reading activities should be designed in such a way that learners complete them independently and construct meaning through the development of metacognitive skills: Planning, supervising and evaluating their own learning process. Learners can develop such skills during collaborative works. The teacher can organize them in groups and give each group different CALL reading passages raising real world issues. The instruction can be as follows: Read the text and write a five (5) pages paper on the theme or main idea to be presented in class. First, learners will read the text and find out its theme or main idea, and next, they will be engaged in a self-directive work such as asking each other questions about which aspect of theme to be developed, how to design the outline, etc. This equally requires them to do extra research in order to get much information about the theme.

2.6. TAKING ACCOUNT OF LEARNERS' COGNITIVE LEVELS

EFL/ESL learners are individuals with different cognitive levels: Language and cultural background, learning strategies, styles and paces, level of assimilation... With CALL, teachers can design the same reading activity in various ways, which allows them to take all these factors into account so that each individual learner recognizes himself in the activities and chooses the one that best suits him. They can make use of different teaching aids such as images, sounds, or graphic organizers. Students who learn best at listening will listen to the text and those who perform well when watch video will do so. Moreover, learners with higher cognitive level can quickly complete a task and move to another one whereas students with lower cognitive level will complete it at lower pace. For instance, in one reading classroom, there can be learners good at other language skills such as speaking, but having problems with text understanding and learners having their reading skills well developed, but being unable to speak fluently. Consequently, during CALL reading tasks, learners who are good at reading cannot further develop their cognitive skills, as they have to wait for the weaker students until they complete the task assigned to all them. In such a situation, CALL allows learners to work at their own pace. Slower learners can catch up, and advanced students can do extra assignments.

3. SUGGESTIONS AND CONCLUDING REMARKS

3.1. SUITABLE CALL SOFTWARE FOR THE READING CLASS

Numerous CALL software are available in the field of EFL/EFL: www.comenius.com/fables;www.eduweb.com/venture.html;http://web2.Uvcs.uvic/elc/studyzo ne/570/pulp, etc. These websites provide teachers and learners with a wide range of real world and updated texts including newspaper cuttings, brochures and, related to socio-political, economic and cultural issues. Teachers must identify their features and potentials, as well as constraints related to their use. They should know CALL theories and approaches in order to design learning activities accordingly. Indeed, CALL is a language teaching/learning approach which allow teachers to use a wide range of tasks, activities, and materials. Besides, they may create specific Webpages, adapt materials and choose technology that suits the CALL reading class.

3.2. AUTHENTIC AND MEANINGFUL READING MATERIALS

Implementing CALL in reading class requires teachers to use authentic reading texts dealing with real world issues like political, social and cultural facts taking place in learners' country or other countries. The texts should be up-to-date and raise current issues that learners know and can discuss. In so doing, learners keep in touch with striking events and phenomena around them. In addition, teachers must know what kind of CALL reading activities are likely to motivate and draw learners' attentions. Activities are equally expected to foster learners' interactions and opportunities for meaning negotiation. Teachers have to evaluate the learning outcomes through learners' performances when they complete CALL reading activities.

3.3. PRACTICAL READING ACTIVITIES

CALL based reading activities are sets of problem solving tasks containing obstacles that learners must overcome in order to achieve understanding. Completing such activities requires them to develop higher order thinking abilities (inference making, critical thinking…) as mentioned above. It equally turns them into active meaning builders, who construct their own knowledge, become autonomous and independent learners.

ACTIVITY ONE: Silent reading of the passage

Reading passage

Gunmen kill 'many' in attack on Nigeria village

Suspected Islamist militants stormed a village in northeast Nigeria on Saturday, killing several people and torching houses near where more than 200 schoolgirls were kidnapped two months ago, a witness said. Clad in military uniforms, the attackers raided the village of Koronginim in a convoy of sport utility and military vehicles, the witness told Reuters by telephone, asking not to be identified. The attackers shouted "Allah Akbar" (God is greatest) before opening fire and killing "many", the witness said. "Two of their leaders were giving orders that they should shoot anyone on sight ... I crawled into the nearby bush and fled from there," the witness added.

Koronginim is in Nigeria's remote Borno state, the birthplace of a five-year-old insurgency by Boko Haram militants, who are bent on carving out an Islamist caliphate in Nigeria's largely Muslim north. The village is about 9 kilometers from Chibok, where Boko Haram abducted the schoolgirls in April, triggering a global campaign for their release. The militants have killed thousands during their campaign, fought back against a military offensive and have stepped up their attacks since the kidnapping

Chibok residents said they could see smoke billowing up over Koronginim. ''The attackers still pursued the fleeing villagers into the bush and shot them'', the village's representative in the Chibok local government, Samuel Ogi, told Reuters. ''Some of the villagers are still in the bush," he said, adding that the insurgents attacked in the early morning and did not leave until midday. A source at Chibok hospital told Reuters that at least four seriously wounded people had been brought in (...)[3]

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[3] The reading passage is part of a full reading text. Adapted from bttp:llarticles. chicagotribune.com/2014-06-211news/sns-rr-us-nigeria-attack-20140621_1-bokoharam-chibok-witness, an article by Lanre Ola accessed on the 2nd January 2015.

ACTIVITY TWO: Problem solving (Finding the suitable word for each gap)

Government- atrocities -overthrew-heavily-most-peacekeeping-secured-
capital-rebels-fears-stages

African peacekeepers trying to stabilize Central African Republic say they are in control of a town where hundreds ----1 ----- armed rebels have massed· not far from the capital. Brigadier General Martin Tumenta Chomou said Saturday that the regional ------2----- force has -----3---- the town of Sibut, located 110 miles from the volatile ---- 4 -----. The arrival of the ---5 ---- in Sibut mid-week has raised alarm about their intentions amid -------6------that they could use the town as a base to -----7-- --another coup in Bangui, the capital. -----8----of the rebels are Muslims from the distant north who -----9----the government last March and later were accused of scores of --10---against the Christian majority in the capital. Revenge killings continue as a new interim ------11-----is being installed.

Step1: Learners read the text individually for understanding. At this stage, they learn about the issue raised in the text "terrorism", and relate the message conveyed to their existing background knowledge in order to better assimilate this phenomenon.

Step 2: Working in pairs, learners skim through the paragraph to get its main idea. Then, they read words from the bank, discus contextual meanings, and agree on the suitable word for each gap.

Step3: Now they click on the agreed words to fill the paragraph. As explained above, the challenge of such an activity is that learners should find the right word for each gap before moving forward. Any time they click on the wrong word, the computer will cross the word and they will try with other words till they find the appropriate one before moving to next gap.

CONCLUSION

This paper raised issues related to the use of CALL in the reading class. The topic under study was as follows: CALL in the reading class: impact on ESL/EFL learners' cognitive development. It aimed at showing how CALL can effectively help learners develop their thinking abilities considering its characteristics and given the worries relating to its implementation in the reading class. From the theoretical framework of the study, I came to the conclusion that CALL can improve leaners' cognitive skills at many levels: Through inference making, problem-solving, critical thinking, using metacognitive skills, and completing tasks corresponding to their cognitive levels. In addition, using suitable CALL software for the reading class, designing challenging CALL reading activities, and presenting activities in diverse ways, are an asset. Although this paper has accounted for how CALL actually improve learners' cognitive abilities in the reading class, there still is something left to be done in the field.   Further studies can be carried on CALL's potentials for individualizing the reading instruction.

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