

## **The Cooperative Learning Approach as a Viable Option in Engaging Tertiary Students in Online Hypertext Reading Comprehension**

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### **ABSTRACT**

Among the boundless resources available to the ESL learners on the internet, the use of hypertext reading materials has necessitated that they employ different approaches to their language learning process. Cooperative learning (CL) is one such approach that has had a favourable effect in the traditional reading classroom. It would be a worthwhile effort to find out if the CL approach has the same effect on the learners in an online environment. Thus, the aim of this study was to find out if CL contributes towards better understanding of reading comprehension texts in terms of their reading score achievement and also their attitude towards the approach itself. The findings revealed that students showed improved achievement in their online hypertext reading comprehension scores compared to their counterparts from the non-CL group. It also showed that the CL students had better attitude towards this approach upon going through the activity. It can be deduced that online hypertext reading comprehension performance can be enhanced with the use of the CL approach. Hence, appropriately planned online reading strategy instruction with the infusion of the CL principles should be made an option so as to make the online reading experience of the students more rewarding.

**Keywords:** cooperative learning; reading comprehension; hypertext; online reading; second language learning

## INTRODUCTION

The way students learn language has taken on a new meaning as the World Wide Web becomes the preferred source of information due to the proliferation of the internet (Niederhauser, 2007). It has provided a multitude of virtually available resources to the language learning process. Among these resources, hypertext materials that are available in abundance on the internet have proven to be important online materials for students' in and out of class use. According to Farkas (2004), the term 'hypertext' refers to the use of hyperlinks to present text and static graphics. For Niederhauser and Shapiro (2004), the most basic feature of the hypertext is its nonlinear structure. By such definition, the hypertext provides language learners with an inexhaustible stream of options to explore, determine and negotiate the way they learn a language. Meanwhile, the term 'reading' has been described as the interaction among the *reader*, *text* and *activity or purpose* by the RAND Reading Study Group (RRSG) of California (2002). When reading an online hypertext passage, this interaction is evident when the learners choose their own reading path (White, 2007). Subsequently, the effectiveness of the strategies used will determine the effectiveness of the hypertext reading material itself (Niederhauser & Shapiro, 2004). Further, these learners construct meaning from the text "through flexible and purposeful choices of relevant hyperlinks, icons, and interactive diagrams" (Coiro & Dobler, 2007).

According to Neo (2005), in the Malaysian context, the permeation of multimedia technology into the educational arena has created an important impact on the academics at tertiary level, at the same time enabling students to use technology in the classroom to create a technology-supported learning environment such as the cooperative learning mode. Here, students are more likely to acquire critical thinking skills and metacognitive learning strategies, such as learning how to learn, in small group cooperative settings as opposed to listening to lectures (McKeachie, 1986). Cooperative learning becomes more viable owing to the conventional view of computer supported collaborative learning (CSCL) that has centered primarily around desktop computers, where learners share mice and screens, and where action and interaction are limited by the constraints of desktop computing (Price, Rogers, Stanton & Smith, 2003).

In the case of Universiti Teknologi Mara (UiTM), there are currently about 160,000 students spread across the country registered in different modes of study and disciplines. This number is expected to increase to 200,000 within the next few years. Hence, in order to meet this vast expansion of student enrolment, UiTM had to diversify and innovate its teaching and learning delivery system. One such move is the adoption of e-learning through the blended learning initiative. Besides face-to-face interaction, students are provided learning opportunities via the cyberspace, unbounded by spatial constraints (Endut et al., 2012). However, when it comes to in-class use of computers for learning, the conventional view afore mentioned by Price *et al.* (2003) holds true. Students still crowd around and are forced to share computer terminals when engaged in online learning in computer laboratories due to logistical constraints. In the act of sharing computers, they are also inadvertently engaged in group discussions of the lesson matter.

Here, one begs to know the effectiveness of such group engagement and discussion through the following two questions:

1. *What is the 'quality' of their discussion and cooperation?*
2. *In view of Question 1, would a formal training of the cooperative learning elements be of help to these students in facilitating their online language learning process to be more effective?*

### *Research Objectives*

Thus, the objectives of this survey were to find out the following:

- i. The difference in the online hypertext reading comprehension performance between the cooperative learning (CL) group and the non-cooperative learning (non-CL) group members,
- ii. The difference in the online hypertext reading comprehension performance for the cooperative learning (CL) group before and after using the cooperative learning approach,
- iii. The difference in the attitude towards group work / collaboration between the cooperative learning (CL) group and the non-cooperative learning (non-CL) group members.

## **LITERATURE REVIEW**

### *Hypertext Reading and Cognitive Processing*

Coiro (2003) divides online texts into three types, namely:

- i. non-linear hypertexts where the hyperlinks are embedded within short passages that encourage readers to navigate their own paths through the information in a nonlinear way;
- ii. multiple-media texts that can integrate a range of symbols and multiple-media formats including icons, animated symbols, photographs, cartoons, advertisements, audio and video clips, virtual reality environments, and new forms of information with non-traditional combinations of font size and color (Brunner & Tally, 1999, cited in Coiro, 2003); and
- iii. interactive texts where in addition to the hypertext and hypermedia features, Web-based texts invite the readers to co-author online texts as they navigate various paths and construct a personal adaptation of the information.

A number of theories of reading and learning may explain the cognitive underpinnings of the hypertext reading process. The cognitive theory of multimedia learning makes use of Dual Coding Theory (DCT) and Cognitive Load Theory (CLT) based on three main assumptions (Ariew, 2006):

- i. information is processed in two separate channels (visual and verbal), and through interaction between the two channels, information in one channel may be transferred to the other,
- ii. each channel has a limited capacity, and
- iii. learners are actively involved in the construction of knowledge.

#### *Cooperative Learning and Online learning*

Chan, Chee and Tan (1993) have distinguished *cooperation* as the activity in which each person is responsible for a portion of the problem solving, while *collaboration* is a coordinated, synchronous activity that is the result of a continued attempt to construct and maintain a shared conception of a problem. According to Johnson and Johnson (1999), the basic elements of cooperative learning are:

- a) positive interdependence,
- b) individual accountability,
- c) face-to-face promotive interaction,
- d) interpersonal and small group skills, and
- e) group processing.

For Duplass (2006) though, the characteristics of cooperative learning are as follows:

- i. Teacher supervision to monitor, facilitate and guide the students.
- ii. Heterogeneous groups of diverse ability levels and backgrounds.
- iii. Positive interdependence through group goals-setting.
- iv. Face-to-face interaction through verbal and nonverbal communication.
- v. Individual accountability enforced through student roles.
- vi. Social skills in and during group interaction.
- vii. Group processing through reflection.
- viii. Evaluation of the individual and group performance.

Jacobs, Ward and Gallo (1997) have maintained that just as cooperative learning facilitates learning with computers, computers too provide many ways for students to collaborate with their peers. In fact, the potential advantages of student collaboration during IT lessons (Tan, Gallo, Jacobs & Lee, 1999) include the following:

- i. As computers can isolate students, cooperative learning brings a social element to information technology-based learning.
- ii. With students being less dependent on teachers, they can instead work together to find and share knowledge.
- iii. Cooperative learning helps students learn with computers, and at the same time, computers furnish students new ways to collaborate with others, such as through email, networked computers, etc.

Tan, Gallo, Jacobs and Lee (1999) have pointed out that student-student collaboration can take place at four points during information technology-based lessons, that is:

- a. Prior to working with computers, students can discuss concepts in the lesson and plan what they will do.
- b. While using computers, students can discuss - either orally or via computer - what they are working on and can take on different roles.
- c. During a pause in computer use, students can analyze what they have learned and done, share information with others, and plan their next steps.
- d. After using computers, students can again analyze and share what they have learned and done, as well as what they need to do next.

## METHODOLOGY

### *Research Hypotheses*

The null hypotheses for the research are as follows:

- i. There is no significant difference in the online hypertext reading comprehension achievement scores between the cooperative learning (CL) group and the non-cooperative learning (non-CL) group members (Ho1).
- ii. There is no significant difference between the pretest and the posttest online hypertext reading comprehension achievement scores for the cooperative learning (CL) group members (Ho2).
- iii. There is no significant difference in the attitude towards group work / collaboration scores between the cooperative learning (CL) group and the non-cooperative learning (non-CL) group members (Ho3).

### *Sample*

BEL260 (Preparatory Course for MUET) is an English language proficiency course run over one semester and taken by semester two students of the diploma programmes throughout the UiTM system. The course content is very similar to that of the Malaysian University English Test (MUET) and is a way of preparing the students for MUET eventually. The research population is homogenous in nature as they are all ethnically Malay and mainly come from middle and lower income families. Their English language proficiency can be classified as ranging from average to below average. Exposure to the language is also mostly limited to in-class usage. For the purpose of this survey, two intact groups of students were chosen: the experimental group (30 students) was labelled as the CL group, while the control group (33 students) was labelled the non-CL group.

### *Treatment for the Experimental Group*

While the control group (non-CL) members were allowed to work and discuss in their own groups as they usually do, the experimental group (CL) members were subjected to the following procedure.

*Procedure:*

Stage 1: Online hypertext reading comprehension (RC1) by students individually followed by answering the online reading comprehension questions by all the students (**CL** and **non-CL**) - (RCQ1) – Pretest

Stage 2: Treatment – The experimental group is trained in the Cooperative Learning (**CL**) approach using the ‘**Read and Explain Triads**’ method over two lesson periods, moving from fully controlled instruction by the lecturer to independent practice by the students (please refer below).

Stage 3: Online hypertext reading comprehension (RC2) by students in their respective groups (**CL** and **non-CL**) followed by answering the online reading comprehension questions individually (RCQ2) – Post test

***The Cooperative Learning approach training: ‘Read and Explain Triads’***

1. Assign students to groups of three (preferably mixed levels of proficiency: lower, intermediate and advanced).
2. Students are instructed to read the online comprehension text that has been assigned to them by the instructor. All the three students will be sitting next to each other and facing the same computer screen.
3. The expected criterion is that all of them are able to explain the meaning of the assigned material correctly.
4. The task is to learn the material being read by establishing the meaning of each paragraph and integrating meaning of the paragraph. The cooperative goal is for the three group members to agree on the meaning of each paragraph, formulate a joint summary, and be able to explain its meaning.
5. Procedure to be used by the student triads are as follows:
  - a) Read all the headings to get an overview.
  - b) All the students silently read the first paragraph. Student A is initially the summarizer and Student B and student C are the accuracy checkers. Students rotate the role for each paragraph.
  - c) The summarizer summarizes in his/her own words the content of the paragraph to his/her partners.
  - d) The accuracy checkers listen carefully, correct any misstatements and add anything that has been left out. Then, both the checkers tell how the material relates to something they already know.
  - e) The students move to the next paragraph, switch roles, and repeat the procedure. They continue until they have read all the paragraphs. They summarize and agree on the overall meaning of the whole text.
6. During the lesson, the teacher systematically:

- a) Monitors each group and assists students in following the procedure,
- b) Ensures individual accountability by randomly asking the students to summarize what they have read so far, and
- c) Reminds students that they can use intergroup cooperation (if necessary).

(adapted from Johnson & Johnson, 1999)

## Assessment Instruments

### The Hypertext Document

The hypertext document was developed using the Macromedia Dreamweaver MX 2004 web design software. Additionally, some elements of java scripts and widgets from available online resources were also used to provide search options and to facilitate online information searching. At the end of the reading passage, an assessment section which is accessible through a link in the menu is provided. This assessment section was developed using Examview (version 5.0), a test construction freeware. The completed hypertext exercise was made available to the students through a link via UiTM's online learning facility, the iLearn system. Following are screen shots of the reading comprehension hypertext document (Figure 1) and the assessment page (Figure 2) used by the subjects in the study.

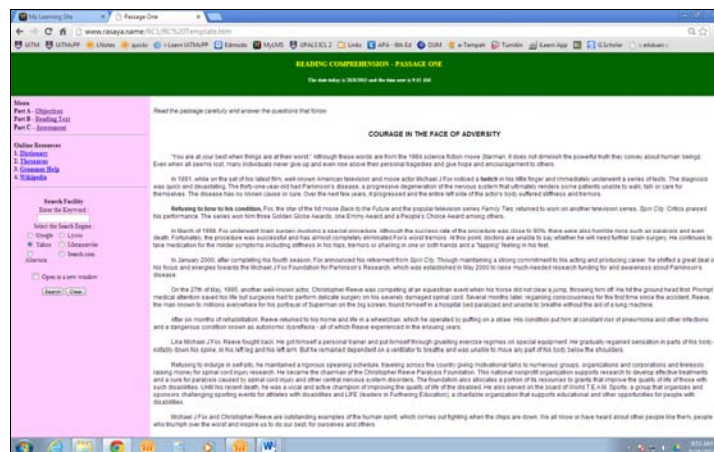


Figure 1: Screenshot of the Primary Interface of the Hypertext Document (Reading Comprehension Passage)

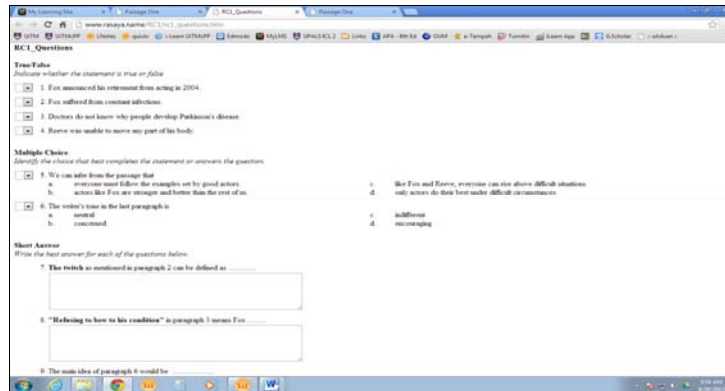


Figure 2: Screenshot of the Assessment Page of the Hypertext Document

*The attitude towards group work / collaboration questionnaire*

The instrument used to gauge the participants’ attitude towards group work and collaboration was developed by Neo (2005). It comprises 13 items on a 5-point Likert scale, namely 1 = *Strongly Disagree*, 2 = *Disagree*, 3 = *Not sure*, 4 = *Agree*, and 5 = *Strongly Agree*. The instrument’s reliability, using Cronbach alpha coefficient was 0.8230 (Neo, 2005). The subsequent Cronbach alpha coefficient among UiTM students returned 0.793. The instrument was administered to the two participating groups: the CL and the non-CL groups after the treatment phase for the experimental group.

**ANALYSIS OF RESULTS**

*Reading Comprehension Performance Scores*

A. *The difference in the online hypertext reading comprehension performance between the CL group and the non-CL group members (Res. Objective 1 / H<sub>0</sub><sup>1</sup>).*

Table 1 Independent samples t-test results for the online hypertext reading comprehension scores between the CL group (n=30) and non-CL group (n=33).

	Groups	Mean	Std. Deviation	<i>t</i>	Sig. (2-tailed)
Online hypertext reading comprehension (Pretest scores)	CL	67.200	8.100	1.071	0.288 (>0.05)
	non-CL	65.121	7.301		
Online hypertext reading comprehension (Posttest scores)	CL	70.533	7.890	2.564	0.013 (<0.05)
	non-CL	65.667	7.175		



Table 1 shows the statistical analysis of the independent samples t-test to test for the significant mean difference in the online hypertext reading comprehension score between the CL and the con-CL groups for both pretest and posttest. For the pretest, it could be established that there was no significant difference between the two groups [ $t(61) = 1.071, p > 0.05$ ]. This was despite the fact that the group mean for the CL group (67.200) was slightly higher than the group mean for the non-CL group (65.121). For the posttest, however, there was a significant difference between the CL group and the non-CL group [ $t(61) = 2.564, p < 0.05$ ]. In fact, the group mean for the CL group (70.533) was higher than the group mean for the non-CL group (65.667). Therefore,  $H_o^1$  that there is no significant difference in the online hypertext reading comprehension score between the cooperative learning and the non-cooperative learning group members after the experimental treatment ought to be rejected. In other words, the CL group had performed significantly better in the reading comprehension assessment as a result of the cooperative learning training.

*B. The difference in the online hypertext reading comprehension performance for the CL group before and after using the cooperative learning approach (Res. Objective 2 /  $H_o^2$ ).*

Table 2 Paired samples t-test results for the online hypertext reading comprehension scores for the CL group before and after using the cooperative learning approach (n=30).

	Scores	Mean	Std. Deviation	<i>t</i>	Sig. (2-tailed)
Cooperative Learning (CL) group	Pretest – Posttest	-3.33	1.86	-9.799	0.000

Table 2 shows the statistical analysis of the paired samples t-test to test for the significant mean difference in the online hypertext reading comprehension score for the CL group before and after the treatment phase. The result establishes a significant difference [ $t(29) = -9.799, p < 0.05$ ] before and after the treatment phase. Therefore,  $H_o^2$  that there is no significant difference in the online hypertext reading comprehension scores for the CL group before and after using the cooperative learning approach ought to be rejected, whereby the CL group had performed better in the posttest (70.533) as compared to in the pretest (67.200).

*Attitude of the students towards group work / collaboration*

*A. The difference in the attitude towards group work / collaboration between the CL and the non-CL group members (Res. Objective 3 /  $H_o^3$ ).*

Table 3 Independent samples t-test results for the attitude towards group work / collaboration between the CL (n=30) and the non-CL (n=33) group members.

	Groups	Mean	Std. Deviation	<i>t</i>	Sig. (2-tailed)
Attitude towards group work/collaboration	CL	55.966	6.173	3.709	0.000
	non-CL	48.606	9.134		

Table 3 shows the statistical analysis of the independent samples t-test to test for the significant mean difference in the attitude towards group work / collaboration between the CL group and the non-CL group members. The result shows that there was a significant difference in the attitude towards group work / collaboration between the two groups [ $t(61) = 3.709, p < 0.05$ ], where the group mean for the CL group (55.966) was significantly higher than the non-CL group (48.606). Therefore,  $H_0^3$  that there is no significant difference in the attitude towards group work / collaboration between the cooperative learning group and the non-cooperative learning group members ought to be rejected. This also shows that members of the cooperative learning group view such group work or collaboration more favourably compared to their counterparts from the non-cooperative learning group.

## DISCUSSION AND CONCLUSION

This study had focused on the use of the face-to-face cooperative learning approach when students are engaged in an online hypertext reading comprehension exercise. The usual understanding of web based cooperative learning takes into account the use of emails, chatrooms, bulletin boards and online forums. Nevertheless, we have to accept the fact that in certain educational settings, the luxury of the notion ‘one student - one computer’ quite often does not exist. The usual scenario is where a few students have to share one computer terminal during their lab hours, and this study focuses on just that. In such situations, group work is unavoidable. Here, cooperative learning provides a viable option to the learners. This is in tandem with Jianhua and Akahori (2001)’s claim that collaborative learning performance should integrate web-based and classroom-based collaborative learning together.

The findings of the survey had positively identified that the use of cooperative learning approach could lead to better online reading comprehension performance when students are engaged in group work while attempting the materials. This parallels Stanton and Fairfax (2007)’s claim that numerous researches have consistently proven that cooperative learning, among others can lead to better retention of information, improved performance in assessment and also better satisfaction of learning materials among the students. However, it is very important that students are provided enough guidance so that they can reap the maximum benefits of cooperative learning. This is more importantly so as Felder and Brent (2007) have said that the imperfect implementation of cooperative learning could complicate matters both to

the instructors as well as the students. Therefore, the onus is on the teachers to create the best possible environments to maximize the potential benefits of cooperative learning (Stanton & Fairfax, 2007). Similarly, Hartnett, George and Dron (2011) have said it is important for teachers to be sensitive of their own roles in building the motivation of their students towards this end, especially in an online environment.

Overall, Neo (2005) has said that the best argument for cooperative learning is that it increases cognitive achievement, motivates students in their learning, increases academic performance and helps develop social competence and skills that are required in the community and the world of work at large. In the same respect, it is hoped that the infusion of cooperative learning, albeit face-to-face, would provide the learners who are engaged in the hypertext online reading comprehension exercise a worthwhile and an enriching experience.

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