Computer-Mediated Reading and its Impact on Learners' Reading Comprehension Skills

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Abstract: Teaching reading is not an easy skill as most students today easily get bored of reading written texts in books and other traditional reading materials. With the emergence of technology and its fast development, educators have integrated the use of computers in teaching reading. Due to technological breakthrough, a study on computer-mediated reading and its impact on the reading comprehension skills of learners of English as a Second Language (ESL) is discussed. This study uses an experimental research design to determine the impact of computer-mediated reading on students' reading comprehension skills. A total of 140 freshmen engineering students at Mapua Institute of Technology, Philippines took part in the study. To carry out the study, the participants were divided into an experimental and a control group. The findings of the study reveal that the use of computer-mediated reading results in a significant improvement in students' reading comprehension skills. The findings are supported by statistical computations using the independent t-test in determining the significant difference in the pre and posttest results of the two groups. After exposing them to the treatment significant learning is acquired by those in the experimental group as compared to those in the control group. The study shows that computer-mediated reading creates a significant impact on students' reading comprehension skills specifically in following directions, noting details, sequencing events, getting the main idea, making inferences and making generalizations. On account of the significant findings of the study, it is recommended that teachers should use computers in the reading classroom.

Keywords: computer-mediated reading, reading comprehension skills, English as a Second Language (ESL), eLearning, language teaching

1. Introduction

Reading plays a very crucial role in man's life as reading influences one's way of thinking, which consequently affects one's total development as a person. Although man's development is influenced by many factors, learning is obtained through reading. Consequently, individuals must find ways how to develop and improve their reading comprehension skills. Integrating new technologies when teaching reading can help both the teacher and learner. Technology helps to restructure and improve the classrooms with authentic activities that will enhance collaboration. It is also an effective tool for interpretative skills, information management and open inquiry. Consequently, it provides an excellent avenue for student motivation, exploration and instruction in a multi sensory diverse world. However, it must be emphasized that using technology for the teaching of reading must be complemented with teachers who have the appropriate pedagogical skills as technology is only a tool. The challenge rests with the educators to effectively integrate it in appropriate places through out the curriculum (Wright, Wilson, Gordon, & Stallworth 2002; Barron & Orwig, 1995).

Before integrating technology in teaching, it is essential for educators to examine first the students' needs. For instance in applying computer-mediated instruction in developing the reading comprehension skills of students, teachers should be aware primarily of their students' level of reading comprehension skills. This will help teachers to use strategies and think of ideas as to how technology can be integrated in their teaching. Studies show that sending English teachers to seminars, workshops and to pursue post graduate degrees help to enhance their competence in teaching the subject (Dumanig, 2005). Attending such training courses expose teachers to new strategies particularly in computer-mediated teaching. Anisawal (1993) found that difficulties in different skills of intermediate students were caused by physical factors and teachers' lack of knowledge of the computer. She suggested that sending teachers for training and integrating technology in teaching would help to improve students' reading comprehension skills. Teachers must be wise in understanding their role and use of technology when providing a technologically advanced learning environment.

The integration of technology in teaching brings benefits to students. Traynor (2003) argues that learning by using electronic communication technology helps students develop and enhance their knowledge and discover new things they might have not thought of without the aid of technology.

Students can come to understand technology while technological tools help them tap into real experiences, fantasies and visions. Min Jung Jee (2011) explains that the use of technology enhances instruction specifically in the field of language instruction. However, the exploration of new technologies for teaching and learning requires time as well as a change in attitude among teachers and students so that they are able to properly use and apply these tools in teaching. Currently, some teachers who are not computer literate find it difficult to use computers in their respective classes. Although computers and multimedia instructional technology are now available in many campuses, the percentage of teachers using them remains low (Cuban, 2003). It is therefore necessary to equip teachers with skills in using CAI to facilitate classroom learning efficiently and effectively.

Studies on the use of Computer Assisted Instruction (CAI) have identified effective learning outcomes among college students and adult learners (Rouse, 2007). It is believed that CAI appeals to varied learning modalities and consequently meets the diverse needs of every student. With CAI students can learn at a comfortable pace and interact directly and continually with computers that provide immediate feedback and positive learning effects (Mustafa, Ashhan, and Turgay, 2011). As a result, many educational institutions today are investing much in technology to enhance students' learning.

In addition, CAI helps students learn many specific skills at various levels, such as; elementary, secondary, college and adult education. CAI has positive effects on the achievement and development of students in different skills (Liao, 2007). In fact, the use of any computer software helps to enhance language teaching and learning (Sawhill, 2008). Computers play a valuable role in focusing students' attention, presenting content and facilitating students' understanding in a lecture (Rap, 2006). Computer programs designed to present information on a screen to students using an electronic blackboard allows an instructor to present similar kind of information as when he uses handouts or overhead transparencies. This shows that using CAI does not really deviate from the traditional approach of teaching, rather it modernizes traditional method using modern technology, and this makes learning easier The use of technology in teaching could be adapted to the type of activity to be learned .

Cayanan (1998) argues that using computer assisted instruction is significant since it produces a positive effect on students' learning capacity. It helps students to progress in accordance with their level of understanding for they learn at their own pace thus making their learning gradual yet effective. With the favorable effects of CAI to students' learning capabilities, Parker (1996) suggests that there should be improvements to be made in tertiary education regarding the availability and use of technology in instruction and teacher preparation. It is believed that the use of computer-assisted instruction will offer a big change and development in improving the quality of education in many schools around the world.

Due to the fast development of computers the use of computer mediated instruction motivated the researchers to conduct a study on computer-mediated reading and its impact on learners' reading comprehension skills. This study primarily examines the effects of computer mediated reading on students' reading comprehension skills such as following simple directions, noting details, sequencing events, getting the main idea, making inferences and making generalizations.

2. Methodology

This study used a descriptive and experimental research design to determine the effects of computer assisted instructional devices in teaching reading. These methods were useful in determining the students' reading comprehension through the use of computer assisted instructional devices.

The subjects of this study were all freshmen engineering students from Mapua Institute of Technology (MIT), Manila, Philippines. Four English classes of freshmen engineering students were chosen. The first two classes were classified as the control group and the other two classes were classified as the experimental group. The classification of both groups was based on age, gender, computer literacy and English language proficiency.

The subjects were given two sets of questionnaires, the first set focused on the students' socio demographic data to ascertain the students' age, gender, computer literacy and English proficiency. The second set of questionnaires focuses on students' reading comprehension skills. The questionnaire consists of questions on following simple directions, noting details, sequencing events, getting the main idea, making inferences and making generalizations. Both sets of questionnaires

were distributed to the subjects in the control group and experimental group twice; both in the pre and posttests. The subjects in the control and experimental groups were given the pretest before they were exposed to the treatment. After the pretest the subjects in the control group were exposed to the traditional approach while those in the experimental group were exposed to the use of computer in teaching reading. The study was carried out in four sessions over four weeks. Each session lasted 1 and a half hours. At the first meeting, the pretest was administered while during the second and third meetings the actual teaching of reading was conducted and the post test was conducted during the last meeting.

To validate the findings, an independent t-test was used to determine the significant difference between the performance of the control group and the experimental group in the pre and post tests. In addition, a correlated t-test was also used to determine the significant difference between the pre and posttest scores of both groups.

3. Results

The results of the study are presented in tables to clearly illustrate the reading comprehension skills of the control and experimental groups in the pre and posttests.

3.1 Pretest reading comprehension level of the control and experimental groups

Table 1 presents a summary of the pretest result of the reading comprehension skills of subjects in both the control and experimental groups.

Table 1: Pretest level of reading comprehension of the control group and experimental group

Reading Skills	No. of Items	Experimental Group Mean Description	Control Group Mean Description
Following Simple Directions	5	4.57 Excellent	4.61 Excellent
Noting Details	5	4.29 Good	4.34 Good
Sequencing Events	7	5.77 Very Good	5.36 Meritorious
Getting the Main Idea	5	3.37 Satisfactory	4.33 Very Good
Making Inferences	10	5.59 Satisfactory	4.83 Passing
Making Generalization	3	2.20 Very Satisfactory	2.33 Very Satisfactory

Table 1 shows the pretest mean of the experimental group's reading comprehension skill is 4.57 rated as "excellent" in following directions, 4.29 rated as "good" in noting details, 5.77 rated as "very good" in sequencing events, 3.37 rated as "satisfactory" in getting the main idea, 5.59 rated as "satisfactory" in making inferences and 2.20 rated as "very satisfactory" in making generalizations. On the other hand, the mean of the control group's reading comprehension skill is 4.61 rated as "excellent" in following directions, 4.34 rated as "good" in noting details, 5.36 rated as "meritorious" in sequencing events, 4.33 rated as "good" in getting the main idea, 4.83 rated as "passing" in making inferences and 2.33 rated as "very satisfactory" in making generalizations.

The results of both groups in different reading comprehension skills show that the subjects have almost the same level of comprehension skills in the pretest result. The differences in reading comprehension skills are seen to be minimal and do not create any significance. To measure whether a significant difference exists in the pretest results, a test of difference is shown In 3.2.

3.2 Test of difference between the pretest scores of the experimental group and control group

The pretest results of the control and experimental groups are vital in this research. Although, the two groups of subjects were equated in age, gender, computer literacy and English language proficiency, the null hypothesis of no significant difference between the score of the experimental group and control group must be established before the treatment is administered to the experimental group. Table 2 shows the comparison of the data from the two groups.

The computed t-value is 0.40 which is less than the tabular value of 1.96, therefore, at five percent level the null hypothesis is accepted. This implies that no significant difference exists between the pretest mean scores of both groups. Having no significant difference in the scores of the two groups

in the pretest will help in analyzing if there is a significant difference after exposing the subjects to the treatment.

Table 2: Comparison of the pretest scores of the experimental group and the control group

Subject	Mean	S.D.	Computed t value	Tabulated t value	Decision	Interpretation
Experimental Group	25.72	3.51	0.40	1.96	Accept Ho	Not Significant
Control Group	25.96	3.55				

3.3 Level of performance of the experimental and control groups in the posttest

At the end of the experimental period, a posttest was given to the experimental and control groups. The results are shown in Table 3.

Table 3: Posttest scores of the experimental and control groups

Experimental Group				Control Group			
Score	Description	f	%	Score	Description	f	%
32-33	Superior	18	25.71	34-35	Excellent	1	1.43
30-31	Very Good	22	31.43	32-33	Superior	8	11.4
27-29	Good	19	27.14	30-31	Very Good	10	14.2
25-26	Meritorious	9	12.86	27-29	Good	22	31.4
23-24	Very Satisfactory	2	2.86	25-26	Meritorious	17	24.2
				23-24	Very satisfactory	10	14.2
				21-22	Satisfactory	2	2.86
Total		70	100.00	Total		70	100.00

Mean = 29.49 (Good)   Mean= 27.53 (Good)

Standard Deviation = 2.53   Standard Deviation= 3.06

Table 3 shows the percentage scores in the posttest of the experimental and control groups. Twenty five point seventy one percent (25.71%) of the experimental group is rated as "superior", in reading comprehension 31.4 % rated as "very good", 27.14 % rated as "good", 12.86 % rated as "meritorious" and 2.86 % rated as "very satisfactory." Furthermore, the findings show a standard deviation of 2.53 and a mean of 29.49 rated as "good." The data tend to show that majority of the subjects are rated "very good" for they obtain 31.43% and only 2.86 % rated as "very satisfactory". It is clear then that the use of computer-mediated instruction is significantly effective in teaching reading particularly in developing the specific reading comprehension skills. This confirms the findings of (Traynor 2003) that the process of accumulating knowledge about teaching will be greatly enhanced by technology.

On the other hand, the posttest scores of the control group reveal that 1.43% of the subjects rated as "excellent", 11.43% rated as "superior", 14.29% rated as "very good", 31.43% rated as "good", 24.29% rated as "meritorious", 14.29% rated as "very satisfactory" and 2.86% rated as "satisfactory", thus obtaining a mean of 27.53 rated as "good" and a standard deviation of 3.06. Furthermore, the table shows that the majority of the subjects are rated as "good" which is equivalent to 31.43%. On the contrary, only 1.43% of the total subjects rated as "excellent." This means that the improvement in the reading comprehension skills in the control group is minimal as compared to the experimental group.

3.4 Posttest reading comprehension level of the control and experimental groups

Table 4 shows the post test result of the experimental group having a mean of 4.93 rated as "excellent" in following directions, 6.50 rated as "very good" in noting details, 4.63 rated as "excellent" in sequencing events, 3.94 rated as "good" in getting the main idea, 6.90 rated as "very satisfactory" in making inferences, 2.79 rated as "excellent" in making generalizations. On the other hand, the control group obtains a mean of 4.77 rated as "excellent" in following directions, 4.43 rated as "good" in noting details, 6.44 rated as "very good" in sequencing events, 4.43 rated as "very good" in getting in noting details.

the main idea, 4.84 rated as "passing" in making inferences and 2.54 rated as "excellent" in making generalizations.

Table 4: The posttest level of reading comprehension of the control and experimental groups

Reading Skills	No. of Items	Experimental group Mean Description	Control Group Mean Description
Following Simple Directions	5	4.93 Excellent	4.77 Excellent
Noting Details	5	4.63 Excellent	4.43 Good
Sequencing Events	7	6.50 Very Good	6.44 Very Good
Getting the Main Idea	5	3.94 Good	4.43 Very Good
Making Inferences	10	6.90 Very Satisfactory	4.84 Passing
Making Generalization	3	2.79 Excellent	2.54 Excellent

Comparatively, in noting details, the subjects in the experimental group perform better by obtaining a mean of 4.63 rated as "excellent" whereas the subjects in the control group obtain only a mean of 4.43 rated as "good". Likewise, in making inferences The experimental group obtains a mean of 6.90 is rated as "very satisfactory" and a control mean of 4.84 rated as "passing". In getting the main idea, the control group obtains a mean of 4.43 rated as "very good" whereas the experimental group obtains 3.94 rated as "good". The findings reveal that the subjects in the control group perform better in the pretest but less improvement is shown in the posttest. However, the subjects in the experimental group show a significant improvement in the posttest for they obtain a mean of 4.33 rated as "very good". The findings run consistently with the findings of (Mustafa, Ashhan, and Turgay, 2011) that the effectiveness of computer devices, also known as educational technology significantly enhance student's learning as compared to conventional instruction.

3.5 Test of difference in the pre and posttest scores of the experimental and control groups

The experimental group was exposed to the use of computer-assisted instructional devices while the control group was taught using the traditional method of teaching. The results of the pre and posttests of both groups were compared to determine if the conventional method of teaching or computer-mediated instruction is effective. The data are shown in Table 5.

Table 5: Test difference in the pre and posttest scores of the experimental and control groups

Measurement	Mean	zd	Computed t-value	Tabular t-value	Decision	Interpretation
Experimental Group Pretest Scores Posttest Scores	15.72 29.49	2.59	13.95	2.00	Reject Ho	Significant
Control Group Pretest Scores Posttest Scores	25.96 27.53	92	4.87	2.00	Reject Ho	Significant

In the experimental group, the computed t-value of 13.95 is higher than the tabular value. Therefore, the null hypothesis is rejected. This means that a significant difference exists between the pretest scores and the posttest scores of the experimental group. If interpreted further, significant learning is acquired by the members of the experimental group after they were exposed to the treatment. This agrees with the findings of (Rouse, 2007) that using technology in teaching helps in improving the reading difficulties of students and enhances their reading comprehension skills.

On the other hand, the control group shows the computed t-value of 4.87, which is higher than the tabular value of 2.00, therefore, the null hypothesis is rejected. This means that there is a difference between the pre and posttest scores of the control group. This means that significant learning is also acquired by the members of the control group after exposure to the traditional approach in teaching reading. However, the difference is less as compared to the experimental group.

3.6 Test of difference in the posttest results of the experimental and the control groups

Table 6 shows the comparison of the posttest results of the experimental and control groups. The level of significance is set at 5 percent and the hypothesis is directional towards the performance of the experimental group.

Table 6: Comparison of posttests scores of the experimental group and control groups

Subject	Mean	SD	Computed t-value	Tabular t-value (.05)	Decision	Interpretation
Experimental Group	29.49	2.53	4.17	1.67	Reject Ho	Significant
Control Group	27.53	3.06				

From the table, it is seen that the computed value exceeds the tabular value. Therefore the null hypothesis is rejected hence, the experimental group performs better than the control group in the posttest. This means that the use of computer assisted instructional devices in teaching reading is seen to be effective as compared to the traditional approach of teaching reading. CAI improves the reading comprehension skills of students. We would however like to emphasise that this does not mean discarding the traditional approach in teaching reading. The traditional or conventional approach in teaching reading is still effective but the use of computer is seen to be more effective since students showed improvement after they were exposed to the treatment. The use of computer mediated instruction still shows an impact on students' reading comprehension skills after being exposed to the treatment. Such findings concur with the findings of (Mustafa, Ashhan, and Turgay, 2011) that the use of computer-mediated instruction in teaching produces a positive effect with respect to the respondents' learning capacity.

4. Discussion

This study is primarily conducted to determine the effects of computer-mediated reading and its impact on learners' reading comprehension skills by considering the different reading comprehension skills of the freshmen engineering students at the Mapua Institute of Technology in the Philippines. Two hypotheses were tested and the result shows that there is no significant difference in the pretest result of the experimental and control groups but a significant difference exists in the posttest of the experimental and control groups. However, the difference in the posttest of the control group is not as much as that as compared to the experimental group. This shows that using the computer-mediated instruction is beneficial to improving students' reading comprehension skills.

The use of technology is seen to be effective since it enhances the students' reading comprehension skills such as following simple directions, noting details, sequencing events, getting the main idea, making inferences and making generalization. Such skills are seen to be a problem to most readers of English as a Second Language but when using the computer-mediated instruction such barriers towards learning have been minimized. This is evident in the results shown in Tables 1-6. All this information Francis did this come from qualitative interviews? Otherwise how can you vouch for this??The use of interactive functions as students read the text may have contributed in the retention of the message. The memory is triggered by the text that is manipulated by the readers themselves. In addition, the feeling of being comfortable and free to manipulate the reading text allows the students to minimize reading anxiety since they are in control of the reading text. Consequently, they easily absorb and understand what they read.

It must be noted in this study that both computer-mediated instruction and the traditional approach in teaching reading are both effective in teaching reading. However, the findings shown in Tables 5 and 6 reveal that the use of computer-mediated instruction obtain a much higher mean as compared to the traditional approach in teaching reading. This only shows that integrating technology in teaching provides more opportunities for students to develop their reading comprehension skills.

5. Conclusion

Based on the findings of the study, it can be concluded that the use of computer-mediated instruction in teaching reading helps considerably in improving students' reading comprehension skills such as, following directions, noting details, sequencing events, getting the main idea, making inferences and generalizations. The use of computer-mediated instruction is seen to be useful in teaching reading

particularly for the new generation of students who are more exposed to the computer when getting information. Perhaps boredom disappears when retrieving information using the computer. Consequently, the use of computer mediated instruction in teaching reading provides positive learning effects to students and creates a significant improvement on their reading comprehension skills.

Therefore, reading teachers should use computers as a strategy in enhancing their reading comprehension skills. Perhaps, minimizing the use of the traditional approach and emphasizing the integration of technology in teaching reading may produce more competent and skillful readers.

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