

**Effects of computer-enhanced instruction  
on vocabulary acquisition among  
adult second language learners**

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# **Effects of computer-enhanced instruction on vocabulary acquisition among adult second language learners**

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## **Abstract**

This study examined the effect of two learning strategies, context and definition based, applied to Computer Assisted Language Learning (CALL). Fifteen students from the Montreal International Language Center (MILC), levels 6 through 9, participated in this research. Students participated in two computer based vocabulary sessions, and completed a post test following each session as well as a final retention post test. The sample was divided into two groups and randomly assigned to one of the two treatment conditions. A t-test methodology was used to analyze the data.

The results revealed that there were no significant differences between context and definition learning strategies when applied to a CALL environment.

Computer technology has been widely used as an educational tool for many years. Advancement in technology has allowed educators in many fields to develop a variety of domain specific software. As the international language of communication, English language educational software dominates the field of second language learning software. A basic Internet search reveals a host of English computer-assisted language learning (CALL) programs. These computer programs utilize various instructional methodologies, some of which have proven to be more effective means of learning a second language than others. As a result of conflicting evidence supporting various teaching methodologies, the present study will examine and evaluate the relative effectiveness of two contrasting

instructional approaches to the design of CALL environments for vocabulary acquisition in second language learners. This study will thereby attempt to identify the most effective instructional strategy for developing CALL software.

### *ESL vocabulary learning*

Children acquiring their first language learn vocabulary from their everyday context through different kinds of sensory input. Learning occurs continuously and effectively in informal, input-rich environments. In second language learning, however, dictionary definitions have often served as the main source of vocabulary learning. This artificial approach is far from sufficient for learners to prepare themselves to deal with natural, communicative situations (Kang & Dennis, 1995).

The use of computer assisted language learning (CALL) has been proposed by different researchers as a solution to achieving some second language learning goals, including vocabulary learning. This is greatly due to the capabilities of the computer to present information in different modes (sound, text, images, etc.) and to interact with the learner.

### *Context learning*

Despite the popular belief that context is conducive to vocabulary learning, research results reveal that some previous studies support the idea while others contradict it. Conflicting views exist concerning the relative superiority of the two

instructional approaches to learning vocabulary: that is, learning vocabulary in a context-rich environment and learning vocabulary in a context-free environment. Some researchers believe that the former approach results in better retention than the latter (Judd, 1978; Krashen, 1982; McCarthy, 1990; Oxford & Scarcella, 1994 ; Schouten-van Parrerern, 1989). However, although empirical research (Grinstead, 1915; Wind & Davison, 1969) has shown that contextualized vocabulary learning is superior to decontextualized vocabulary learning, such studies are few in comparison to the number of studies that have failed to produce results which favor context-dependent vocabulary learning. Moreover, some studies have even obtained results strongly in favor of learning vocabulary through word lists (Seibert, 1930; Morgan & Bailey, 1943). These conflicting results indicate that superiority of one instructional method has not been clearly established. Accordingly, there appears a need to obtain more empirical data in order to define the instructional strategy most effective for the acquisition of vocabulary by second language learners.

### ***Computer-Assisted Language Learning (CALL)***

Computer-based language learning is increasingly becoming a part of many English as a second language (ESL) programs. However, if not used appropriately computer assisted language learning (CALL) can produce few positive results. Indeed, inappropriate use can even lead to negative effects on the language learner.

Many researchers have subsequently tried to measure the effects of CALL through a variety of studies. The 'Plato' program by Yeager (1977) pushed for the incorporation of technology into the classroom, regardless of the program or domain. Steven (1989) found computers to be of significant benefit because they can accommodate diverse learning modes and strategies, which pertain to the individual, learner's preferred learning styles and needs. Nevertheless, Thompson (1993) cautions that the 'novelty aspect' of many new software programs could influence their effectiveness.

With this in mind several studies were considered for their findings in relation to the topic. Two studies done by Chin (1992; 1993) found that Computer Assisted Language Learning (CALL) was helpful for writing instruction. Two other studies done by Kitao at Doshisha University (1992; 1995) developed programs of reading and writing and found 'satisfactory' results in the learners. Culver also measured positive results in a 1991 study. College entry test scores were improved quickly using a CAI reading program. These studies; however, contradict with the results of Lore & Chamberlain (1990) who found non-CALL participants to achieve greater reading skills than CAI subjects.

Kang and Dennis (1995) applied multi-modal materials (definitions, pictures, context) to Korean fifth-graders to promote long term recall of vocabulary, listening comprehension and spontaneous use of vocabulary. The context approach was most effective. Integrated modalities were seen to be superior to other single phase models. Likewise, Liaw (1997) tested elementary

students with computer based books in an ESL classroom. Optimal results were recorded when the learners worked cooperatively in groups. This, combined with CALL appears to have been very effective.

The preceding two studies highlight the question of how should CALL be used properly and/or effectively. Should it be used in its most simplistic form with few pictures, no sound and only basic applications in an effort to avoid distraction from the content, or should all forms of multi-media be incorporated into the learning program to optimize the technology and subsequently the learning experience itself. Also, should the learning experience be undertaken singly or should more cooperative, group work be used. Results of previous research have imparted only a hazy understanding of the effectiveness of CALL. Additionally, because these studies focus on second language learning in children, results cannot be easily extended to a wider population of adult learners.

Pederson (1987, as cited in Kang, 1995) points out three major trends in past research that might account for the non-illuminating findings concerning the impact of CALL: (a) the past studies were mostly comparative studies (CALL versus no-CALL); (b) researchers attempted to attribute learning gains to the medium itself rather than to the attributes of the CALL software used; and (c) there was a tendency among these comparative studies to limit the types of CALL programs to tutorial or drill-and-practice to closely replicate a control group's instruction. Pederson concludes that it is not CALL itself but the specific way instruction is coded in CALL software that has the potential of improving learning.

In an attempt to clarify the efficacy of CALL software, aspects of previous studies will be re-addressed in our study in an attempt to identify the computer learning environment which lends itself most effectively to vocabulary acquisition and retention in adult second language learners.

Despite the potential capacities of CALL, little exploration has been done to investigate its advantages as a tool to support second language learning (Dunkel, 1991; Pennington, 1989 as cited in Kang 1995). In addition, the minimal amount of empirical research which has taken place, addressing the area of Computer-Assisted Language Learning (CALL), has produced ambiguous results with regards to its effectiveness (Roblyer, Castine, & King, 1988 as cited in Kang, 1995). Additional queries lie in the relative effectiveness of context-free versus context-rich environments, due to the inconclusiveness of previous research, as outlined above. These ambiguities identify a need to distinguish the most effective means of language learning in a computer-based environment.

Our study will attempt to identify the comparative effectiveness of two different instructional methodologies by which adult second language learners acquire vocabulary in a computer-based environment: context-free versus context rich. To do so, we will test the acquisition and retention of vocabulary by adult second language learners in both context-free(word-definition) and context-rich(word-context) computer environments. Although many traditional research studies, which addressed the effectiveness of CALL, utilized a control versus

experimental model of research design, we will follow the design of more recent literature, including Kang (1995),, which adheres to an experimental versus experimental design. In comparing context-free and context-rich environments, we are comparing the instructional strategies behind the computer as a tool. Additionally, we will conduct follow-up testing in order to test the retention of vocabulary acquisition.

## Methods

### *Hypothesis*

Given results of previous research in this domain supporting the superiority of a context-rich learning environment, we hypothesized that there would be a significant difference between a definition based learning strategy and a context-based approach. We predicted that both the initial posttest, testing for comprehension and learnability, and the delayed posttest, testing for retention, would show different levels of achievement from students who received the context treatment as compared to the definition treatment.

### *Participants*

The subjects for the study were students from the Montreal International Language Center (MILC), a language school owned and operated by College La Salle, 2000 Sainte-Catherine Street West. With the exception of one student who was a Quebecker 40+, all were international students ranging in age from 18-35. The students were of mixed ethnic and linguistic background; the majority of whom came from Mexico, Colombia, Korea, Japan, Taiwan and China. A minority of other Latin American, African, European and Asian countries were also represented. The participants had either completed level 5 of 10 or were at the necessary skill level to be competent in this intermediate level of development. Most also possessed basic computer skills, as they used e-mail on a regular basis to communicate with friends and family back home.

The study targeted intermediate students from levels 6-9. Each intermediate level was represented by the sample population. The total number of students who participated was 15. The students were randomly assigned to one of the two treatment groups, one having 8 members, the other having 7.

## *Design*

Two groups were administered two different experimental treatments involving vocabulary in a CALL environment. The design of the study conducted was based on the design of the Kang and Dennis study (1995) with some alterations due to the number of subjects and a lack of resources. Instead of three treatments, as used by Kang and Dennis (word-definition, word-definition-picture, word-context), we employed two treatments ( definition, context). These two treatments were used in order to measure the difference, if any, between context based and definition based vocabulary CALL instructional designs.

The material in these treatments was based on 25 new vocabulary words linked to the corresponding units being covered in the level 6 textbook. The same vocabulary items were utilized in both treatments. In Treatment One, the vocabulary was presented with definitions. In Treatment Two the vocabulary words appeared in the context of a story or paragraph. Each treatment lasted approximately 20-30 minutes. An identical posttest was administered to both groups in order to measure the acquisition of the new vocabulary. This required approximately 10-15 minutes to complete. One week following initial testing, a second treatment with 25 new words was administered. Once again the same subjects were presented with a definition or a context treatment and given an identical posttest. The week following the second treatment, a 20-25 minute follow up posttest was administered to test the retention level of the vocabulary. This was comprised of a written and an oral component. Students were asked to write sixteen sentences using the vocabulary words presented in the previous two sessions.

Eight of the words were to be written in a context form and eight words in a definition form. Likewise, the students were required to orally provide eight context sentences and eight definition sentences based on the presented vocabulary.

## *Materials*

Materials needed to conduct this study consisted of computers, software, and the print based posttests. The computers were located in the computer lab in the Education Department at Concordia University. The software was designed by the research team after careful consideration of the ESL textbook, textbook vocabulary, course outline and students' English level. Based on the tasks and vocabulary of the software programs, appropriate posttests were constructed by the members of the research team.

## *Procedure*

- Before the treatments could be implemented, the level 6 teacher had to be trained in use of the posttests and the treatments themselves. This did not prove difficult as the instructor was a member of the research team.
- The treatments for this study were administered to intermediate English students of MILC, La Salle College.
- After a basic introduction to using the computer and the program students were randomly assigned to one of two treatment groups. The definition based treatment group consisted of 7 participants. The context based treatment group consisted of 8 participants.
- The vocabulary was intended to be new to the students. The treatment administered to the first treatment group of 7 students, consisted of 25 vocabulary in a traditional definition format. The treatment administered to the second treatment group of 8 students, consisted of 25 vocabulary words in a context-based format using a story or a paragraph. Students were allowed 20-30 minutes to complete each treatment and thereby acquire the vocabulary.
- Both the context treatment group and the definition treatment group received identical posttests, testing their acquisition and understanding of the 25 new vocabulary words introduced during the computer session. The test was composed

of a word-definition matching exercise and a gap fill exercise. Students were given approximately 10-15 minutes to complete the test. See Appendices.

- A second session was held the following week. Twenty-five new vocabulary words were given to the two treatment groups. The first group received a definition treatment while the other received the context treatment. An identical posttest was given to both groups to measure acquisition.
- A test for retention of new vocabulary was administered one week after the second session. This test was composed of 50% written and 50% oral assessment items in order to test for retention. See Appendices.
- Results of both groups were combined, tabulated and analyzed using quantitative statistical measures.

## Results

The principal question raised in this study was whether a significant difference existed between two computer based learning strategies: Context based CALL, and Definition based CALL. In answering this question various data were gathered, including the scores from three posttests.

Descriptive statistics were computed for the scores the participants achieved in these three posttests, and results are summarised in table #1.

In order to establish if a significant difference existed in between the two treatment conditions, a t-test statistical analysis was conducted for every one of the sets of scores of the posttests. These results are reported in table #2. The main reason this statistical analysis methodology was used was due to the small sample size with which the experiment was conducted.

### *Descriptive statistics*

Table #1 presents the means and standard deviations of the two treatment groups as achieved in the three different posttests that were conducted. The first and the second posttests were based on a scale of 0 - 12 points, while the third posttest was based on a 0 - 31 point scale.

In the first post test, the means of the context and definition groups were almost identical. The mean of the context group was 10.875, while the mean of the definition group was 10.857. It's also worth noting that both were really close to 12 which is the

highest possible score on the scale. In the second posttest the means of both groups moved slightly down the scale. For this posttest the context group mean was 9.500 while the definition group mean was 10.43.

The results from the third post test showed considerably lower scores for both groups. It is important to remember that the score scale for this posttest was 0 - 31. The mean of the context group was 13.75, while the mean of the definition group was 12.86.

When analyzing the variability of the groups in the different posttests, the following was found: In posttest #1 and #2, higher standard deviations were found for the definition group. It is believed that this happened because of the presence of an outlier in this group.

One can also note that as we move from posttest #1 to posttest #2, the within group variability increases for both treatment conditions. This can be attributed to a correction that was made in the assessment instrument.

*Table #1: Summary of descriptive statistics*

Treatment	N	Mean			Standard Deviation		
		Post test # 1	Post test # 2	Post test # 3	Post test # 1	Post test # 2	Post test # 3
<b>Context</b>	8	10.875	9.500	13.75	1.458	1.852	4.95
<b>Definition</b>	7	10.857	10.43	12.86	2.268	2.82	3.85

Note: Test 1 and Test 2 are based on a 0-12 score scale. Test 3 is based on a 0-31 scale.

### *T-tests*

Table #2 summarizes the t-tests that were conducted using the data. Three tests were conducted, one for each of the three posttests. In all three cases, the results showed no significant differences between the two conditions of the independent variable. P values were very high. P was .99 for the test #1. P value for test #2 was the lowest at .47, but still far from providing any evidence of a significant difference between the treatment groups.

*Table #2: Results of t-tests*

<b>Posttest</b>	<b>Results of t-test</b>
<b>Posttest #1</b>	95% CI for mu (C) - mu (D): (-2.21, 2.25) T-Test mu (C) = mu (D) (vs not =): T = 0.02 P = 0.99
<b>Posttest #2</b>	95% CI for mu (C) - mu (D): (-3.72, 1.9) T-Test mu (C) = mu (D) (vs not =): T = -0.74 P = 0.47
<b>Posttest #3</b>	95% CI for mu (C) - mu (D): (-4.1, 5.9) T-Test mu (C) = mu (D) (vs not =): T = 0.39 P = 0.70

## Discussion

The main purpose of this research was to identify which learning strategy, definition or context, was superior when applied to vocabulary learning in a CALL environment. Results from this study did not show any significant differences between the two treatment conditions. Both learning strategies equally promoted vocabulary learning.

The results of this study not only contradict the findings Kang and Dennis (1995), which supports the supremacy of context based CALL when compared to definition based CALL, but they also contradict the most recent research in the field of context-based learning which maintains that a context-rich environment is superior to a context-free environment (Judd, 1978; Krashen, 1982; McCarthy, 1990; Oxford & Scarcella, 1994; Schouten-van Parrerern, 1989). If the results of our study are assumed to be correct, practical implications compel us to conclude that when developing CALL for vocabulary learning, the two learning strategies will have the same effect on the learner.

It is difficult to be sure whether the results of this experiment can be attributed solely to treatment effects given that research involving computer based learning, as is this study, is composed of many elements which have the potential to be problematic. Problematic elements can generate unreliable results. This study incurred several complications and weaknesses due to the complexity of the research design elements. These weaknesses include the software, the n size and the assessment instruments.

The study necessitated the development of a software to precisely meet the needs of the research design. Thus, a software was developed which addressed both learning strategies under investigation, context-free and context-rich. Because the CALL software used in this study was newly developed and had not been previously utilized, it is

questionable whether it was a valid representation of the learning strategies that the study was trying to compare.

Gaining access to a sample population proved to be a complex task. Although a sample population had been identified, actually gaining entry required a multifaceted approach due to administrative delays, computer access, and identification of enough intermediate level students. Through each of these delays and negotiations, the n size of the study decreased in size. A larger n size may have produced more reliable results.

Finally, the predictive power of the assessment instruments was limited. The test format as well as the level of difficulty of the vocabulary words was misjudged. The test format utilized in posttest one was too simple, producing ceiling effect results. The format of the second and third posttests was altered in order to increase the strength of the assessment tool, allowing for more variability. The level of difficulty of the actual vocabulary words was affected by prior subject knowledge. It was difficult to anticipate which vocabulary words each student had already acquired. Individual students had been exposed to and thereby learned different vocabulary. Additionally, eight of the fifteen subjects were of Spanish speaking decent. The fact that some of the English vocabulary words resembled their Spanish equivalents in the written form, was overlooked. Conducting a pilot test may have allowed the researchers to anticipate some of these difficulties that were encountered.

The results of this research can be attributed to the nature of the treatment conditions or to the weaknesses in the research design. However, without further research it is impossible to discern which factors affected the results of this study and to what degree. Future research in the domain of computer assisted language learning should address these factors in an attempt to control and ultimately clarify these results.

## Conclusions

The purpose of this research is to investigate the effect of computer-enhanced instruction on vocabulary acquisition among adult second language learners. No significant differences were found between the context and definition learning strategies in a CALL environment. The results of this study contradict other recent findings, which support the superiority of a context-rich learning environment. However, these results should be carefully considered due to weaknesses in the research design. There still exists a need to further investigate these two learning strategies as well as others that may be applicable to a CALL environment. Future research with improved assessment instruments and a larger n size would contribute to more conclusive results, which would aid researchers and educators in developing more effective CALL tools.

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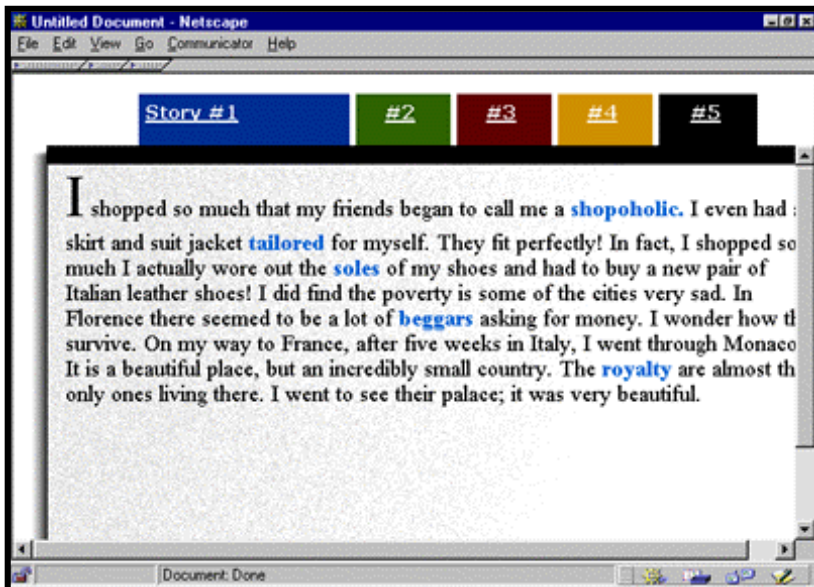
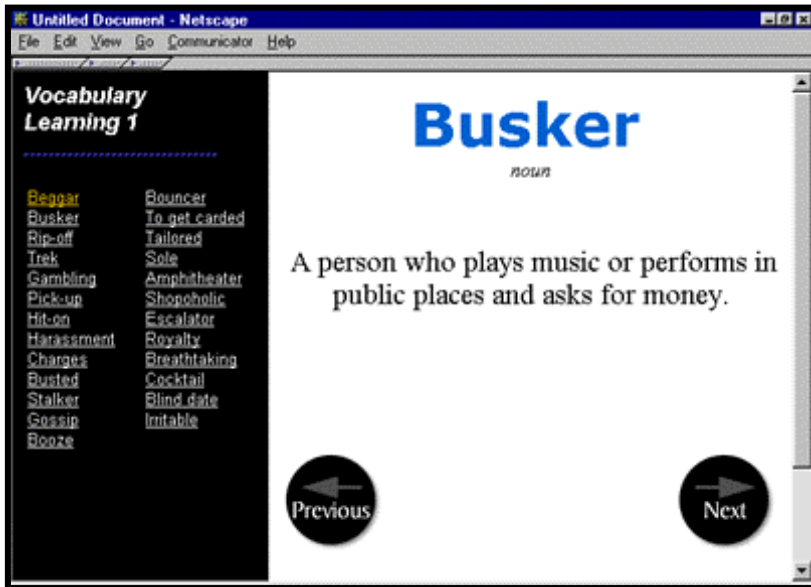
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## Appendices

## **Appendix A**

Software



## **Appendix B**

### Assessment Instruments

## **Appendix C**

Summary of Minitab Outputs

# Posttest #1

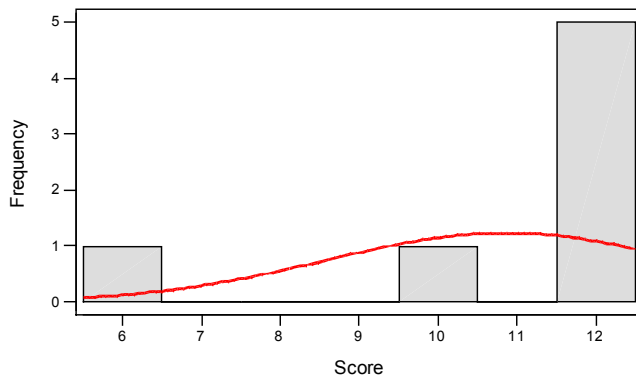
## Descriptive Statistics

Variable	Treatmen	N	Mean	Median	TrMean	StDev
Score	C	8	10.875	11.500	10.875	1.458
	D	7	10.857	12.000	10.857	2.268

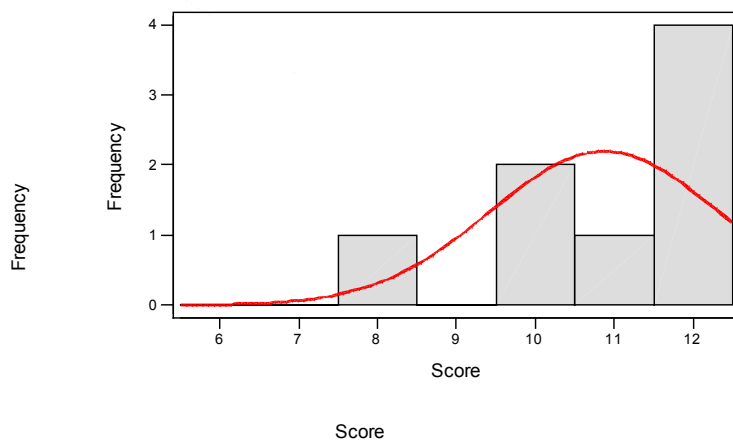
  

Variable	Treatmen	SE Mean	Minimum	Maximum	Q1	Q3
Score	C	0.515	8.000	12.000	10.000	12.000
	D	0.857	6.000	12.000	10.000	12.000

Histogram of Score, with Normal Curve  
(Treatmen = D)



Histogram of Score, with Normal Curve  
(Treatmen = C)



## Two Sample T-Test and Confidence Interval

### Two sample T for Score

Treatmen	N	Mean	StDev	SE Mean
C	8	10.88	1.46	0.52
D	7	10.86	2.27	0.86

95% CI for  $\mu$  (C) -  $\mu$  (D): ( -2.21, 2.25)

T-Test  $\mu$  (C) =  $\mu$  (D) (vs not =): T = 0.02 P = 0.99 DF = 1

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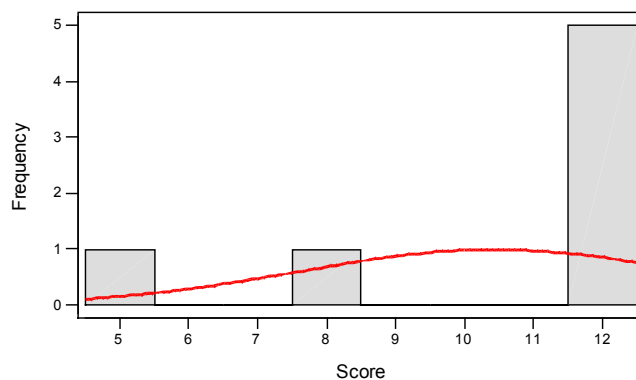
## Posttest #2

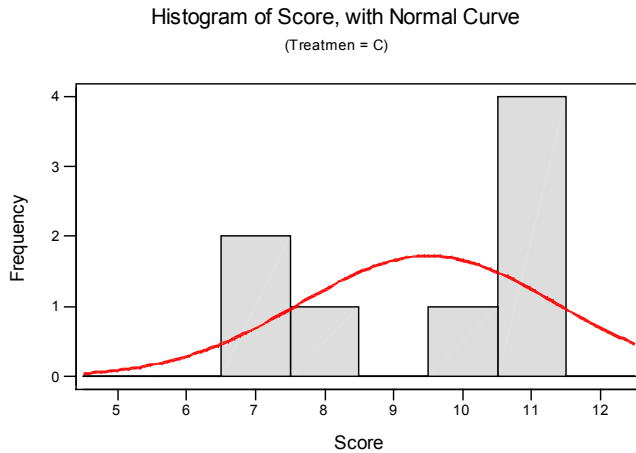
### Descriptive Statistics

Variable	Treatmen	N	Mean	Median	TrMean	StDev
Score	C	8	9.500	10.500	9.500	1.852
	D	7	10.43	12.00	10.43	2.82

Variable	Treatmen	SE Mean	Minimum	Maximum	Q1	Q3
Score	C	0.655	7.000	11.000	7.250	11.000
	D	1.07	5.00	12.00	8.00	12.00

Histogram of Score, with Normal Curve  
(Treatmen = D)





## Two Sample T-Test and Confidence Interval

Two sample T for Score

Treatment	N	Mean	StDev	SE Mean
C	8	9.50	1.85	0.65
D	7	10.43	2.82	1.1

95% CI for  $\mu$  (C) -  $\mu$  (D): ( -3.55, 1.7)

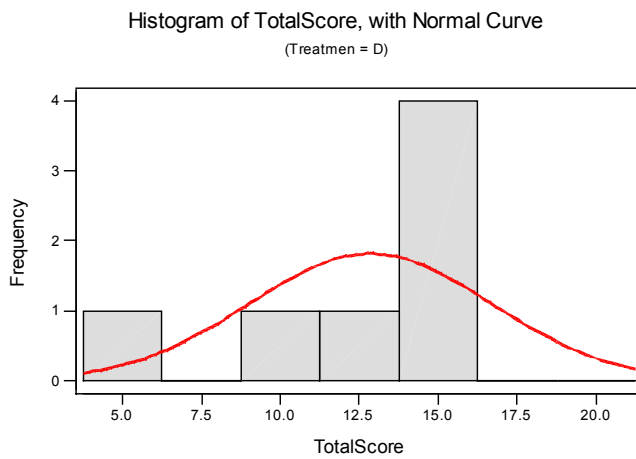
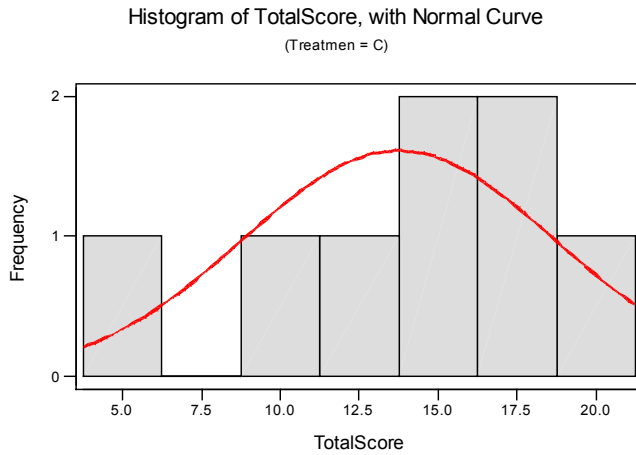
T-Test  $\mu$  (C) =  $\mu$  (D) (vs not =): T = -0.76 P = 0.46 DF = 13

## Posttest #3

### Descriptive Statistics

Variable	Treatment	N	Mean	Median	TrMean	StDev
TotalSco	C	8	13.75	14.50	13.75	4.95
	D	7	12.86	15.00	12.86	3.85

Variable	Treatment	SE Mean	Minimum	Maximum	Q1	Q3
TotalSco	C	1.75	5.00	20.00	9.75	17.75
	D	1.45	5.00	16.00	11.00	15.00



## Two Sample T-Test and Confidence Interval

### Two sample T for TotalScore

Treatmen	N	Mean	StDev	SE Mean
C	8	13.75	4.95	1.7
D	7	12.86	3.85	1.5

95% CI for mu (C) - mu (D): ( -4.1, 5.9)

T-Test mu (C) = mu (D) (vs not =): T = 0.39 P = 0.70 DF = 12

## **Appendix D**

Summary Protocol Form

**Concordia University  
Summary Protocol Form  
Research with Human Subjects**

**Title of Research Project:** Effects of computer- enhanced instruction on vocabulary acquisition among adult second language learners

**Sample of persons to be studied:** Participants will be approximately 20 students from the Montreal International Language Center (MILC), a language school owned and operated by College La Salle. They are all international students ranging in age from 18-35, and of mixed ethnic and linguistic background. The majority of them come from Mexico, Colombia, Korea, Japan, Taiwan and China. A minority of other Latin American, African, European and Asian countries are also represented. Participants are all enrolled in the English level 6 (out of 10) course.

**Method of recruitment of participants:** The students will be asked to voluntarily participate in the study through an announcement by the research team. Participants will be informed that their decision to participate or not participate in the research study will not have any consequences on their program evaluations.

**Treatment of the participants in the course of the research:** The participants will be asked to participate in three activities: 1) four 30-45 minute sessions using one of two instructional treatments; 2) a 10-15 minute posttest covering the vocabulary targeted by the CALL instructional strategies; 3) a 10-15 minute follow-up posttest one week after the initial posttest. The treatment sessions will be administered as part of their course.

## **ETHICAL CONCERNS**

**Informed Consent:** To get the informed consent of the students that will participate in the study, a written consent form will be used. This form will be provided to the participants the week before commencement of the treatment. (Please refer to Appendix A for consent form).

**Freedom to discontinue:** The right of the participants to discontinue will be granted at any time. This is clearly indicated in the consent form and will also be verbally stated at the beginning of the treatment. Participants who choose to discontinue will be assigned another activity.

**Risk to subject's physical and psychological welfare:** none.

**Post research explanation and/or debriefing:** After the final follow-up posttest is conducted, the students will be informed that their participation in the study is over. The telephone numbers of the researchers will be given to participants if they want to get in contact with the research team to find out their personal score on the tests or the results of the study. Participants will also be informed that in the case of publication of the research, their identity will be protected. Since this study does not include deception, debriefing is not necessary.

**Confidentiality of results:** Results of posttests will be held confidential. Only the researchers will have access to them. If published, test results will refer to the participants as a group and never to particular persons.

**Protecting and/or addressing participant's "at risk" situations:** We will assure that the personal information of participants remains confidential throughout the study and after it. If any problematic situation were to arise, participants will always have the right to discontinue their participation in the study. Any participant who discontinues the study will be assured that any information gathered from them will be destroyed.

**Expected benefits to be derived from this research:** It is expected that the participants will greatly benefit from this opportunity of complementing their normal language training, with the use of CALL. Findings of this study will help school administrations and instructors to better integrate their computer facilities with their educational goals and strategies.

**Appendix E**

Consent Form

Dear participants

This is to ask your consent to participate in a research study to be conducted by Christopher Chisamore, Guillermo Patron, Eunyong Lee and Krista Miller, as part of University research course. This research is being conducted under the supervision of Dr. Richard Schmid and Mr. David Wells of the Department of Education at Concordia University.

**Purpose**

The purpose of the research is to investigate the effects of context (word-definition vs. word-context) on vocabulary learning in a computer-based environment. We hope that our research will add to the knowledge for making the computer a more effective learning tool.

**Procedure**

The study will be conducted on a regular school day at Montreal International Language Center (MILC). Each of four sessions will last approximately 30-45 minutes. After a basic introduction to using the computer and the program, four sessions will be administered over a two-week period. Each treatment will follow a two day coverage of a unit in the textbook and be based on the material in these units. One week later, you will be asked to answer more questions about the same vocabulary words. This will take approximately 10-15 minutes.

**Condition**

- Any information that is obtained in connection with this study will remain confidential. The participants identity will not be revealed in the study results.
- The participant is free to withdraw consent and discontinue the study at any time without negative consequences.
- The procedure itself shall in no way endanger the physical or psychological well-being of the participants.
- The data from this study may be published
- There is no hidden motive, of which the participants are not informed hereby.

Please complete the attached form. Thank you for your cooperation.

\_\_\_\_\_  
Christopher Chisamore

\_\_\_\_\_  
Eunyong Lee

\_\_\_\_\_  
Guillermo Patron

\_\_\_\_\_  
Krista Miller

## Consent Form

I have carefully read the description of the study in the letter and fully understand the conditions set forth therein. Hereby.

- ❖ I freely **CONSENT** and **AGREE** to participate in this study. (        )
- ❖ I **DON'T** want to participate in this study. (        )

PRINT NAME: \_\_\_\_\_

SIGNATURE : \_\_\_\_\_

DATE: \_\_\_\_\_

## Appendix F

## Appendices G