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# CALL-assisted Enhancement of Grammatical Accuracy: Iranian EFL Learners Studying in Rural Settings

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Abstract—The current study intended to investigate the extent to which using two types of instructional materials—computer-based vs. print-based materials—may affect Iranian EFL learners' grammatical accuracy. At the outset of the study, thirty homogenous high school EFL learners were randomly assigned to experimental and control groups. Subsequently, a pre-test was administered to the participants to gauge their familiarity with the targeted grammatical structures before the treatment. During the treatment, the researchers used a grammar textbook to teach the learners in the control group, whereas for those in the computer group the very grammatical points were taught through computer-based materials in a language lab. After the treatment phase, a post-test was administered to measure learners' achievement. The results revealed that utilizing computerized instruction within experimental group led to highly positive gains. However, using computerized materials was not found to be that much effective, as the obtained results were in favor of control group. Accordingly, it can be concluded that integration of computerized instructions in the EFL classrooms might help motivate and enhance learners' mastery of English grammar, though the findings of the current study were a bit contradictory in this regard.

Index Terms—CALL, computer-based materials, print-based materials, EFL learners

## I. INTRODUCTION

Teaching grammar is a contentious area of language teaching. Celce-Murcia (2001) stated that teaching grammar means enabling language students to use linguistic forms accurately, meaningfully, and appropriately. Traditional grammar teaching used to employ a structural syllabus and lessons composed of three phases: presentation, practice, and production (or communication), often referred to as 'the PPP' approach. These days, however, most teachers embrace a more communicatively oriented approach, starting with a communicative activity such as task- or content-based materials (Celce-Murcia, 2001).

Since time and technological progress go hand-in-hand, human beings need to follow, and grow, as well. Besides, technology has spread considerably and traces of its application can be found even among social sciences and humanities. Nowadays, technology can be seen in language learning and teaching context and computers can be used in language learning settings where the main aim is improving students' language skills. In the light of this, both teachers and students alike are required to learn how to use computer-based materials in order to handle the various teaching and learning situations.

Over the past decades, dramatic changes have taken place in the way technology has been tailored to different perspectives of English language teaching and learning. Ellis (2003) is of the view that conventional language teaching practices can at times turn to a demotivating and monotonous type of endeavor and learners exposed to learning in such circumstances are likely to lose their interest and motivation. Christopher (1995) argues that computerized methods are more beneficial and effective for learners than traditional ones, and hence application of computerized materials is being referred to as one of the major factors underlying learners' motivation and positive attitudes in EFL context (Rahimi & Hosseini, 2011).

Based on what Zhao (2007) puts forth, it is more and more accredited that creating opportunities for language learners to use technology in their learning can be useful in different ways (cited in Rezvani & Ketabi 2011). Instructors and teachers around the world are looking for ways to enhance learners' motivation in using computerized materials in order to improve learners' language skills. In this regard, it has been stated that computers, in general, and language software, in particular, play a significant role in learning a second/foreign language.

The application of computerized teaching materials and online courses is not yet commonplace in Iranian EFL settings, especially in rural areas due to poor socioeconomic condition, poverty among rural families, authorities' inattention to computerized facilities, inaccessibility of broadband internet, paucity of trained instructors, and lack of administrative support. In such circumstances, scant research seems to have been allotted to investigating the potential impact of computerized teaching methods on Iranian EFL learners' achievement. Thus, this ostensible gap in the literature provided incentive for the researchers in the current study to embark on a probe into the effects of computer-based instruction on learners' grammatical enhancement.

# A. Statement of the Problem and Research Questions

In spite of the fact that English language is being taught in Iran from sixth to twelfth grade in public schools, the output does not always meet the demands of higher education, and complaints have often been expressed regarding students' poor proficiency in English. Therefore, it is deemed worthwhile to investigate the effectiveness and usefulness of computerized methods and instructional software on the performance of English language learners. In an attempt to meet the objectives of the current study, the following research questions were put forth:

- 1. Does the use of computer-based materials have any significant effect on enhancing Iranian EFL learners' grammatical accuracy?
- 2. Does the use of print-based materials have any significant effect on enhancing Iranian EFL learners' grammatical accuracy?
- 3. Is there any significant difference between the use of computer-based vs. print-based materials for the enhancement of grammatical accuracy among Iranian EFL learners?

## B. Significance of the Study

In light of the revolution occurring in information technology and the scientific challenges of the 21<sup>st</sup> century, there has emerged an unprecedented amount of interest in applying computers in all aspects of individuals' (educational) lives. A large body of international research has been conducted to measure the effectiveness of computer usage in the process of language instruction (e.g., Abu-Seileek, 2004; Al-Qumoul, 2005; Rezvani & Ketabi, 2011). Yet, the application of CALL in rural contexts still seems not to have received the attention it deserves.

Furthermore, as far as the researchers in the current study are informed, there is a noticeable paucity of research concerning the effect of computer-based instruction of grammar, particularly in Iran's EFL learning context. Thus, informed by these gaps in the literature on the issue, the current study strives to reunite the theoretical and practical concerns in computer-based education via focusing on one of the key components in language learning, i.e. grammar. After all, the findings of the current study are thought to be functional for various groups of people, including curriculum developers, course book designers and other educational stake-holders and policy-makers.

# II. LITERATURE REVIEW

Technology in language teaching is not a new concept; it has been around for decades. As Dudeney and Hockly (2007) claim:

Computer-based materials for language teaching, often referred to as CALL (Computer-Assisted Language Learning) appeared in the early 1980s. Early CALL programs typically required learners respond to stimuli on the computer screen and to carry out tasks such as filling in gapped texts, matching sentences halves and doing multiple-choice activities (p. 7).

In what follows, a brief overview of the studies dealing with the efficacy of CALL in furthering educational outcomes is provided.

Several studies have been conducted to evaluate the impact of utilizing computer-based materials on EFL learners' enhancement in terms of English language proficiency. In general, the findings obtained by the majority of previous studies point to language learning gains among EFL learners resulting from the implementation of computer-based materials (e.g., Abu-Seileek, 2004; Al-Qumoul, 2005; Rezvani & Ketabi, 2011). Yet, most of the studies with such a focus have been conducted in urban settings and it, therefore, appears that the effectiveness of computers in rural settings still remains an underresearched area.

Abu-Seileek's (2004) investigation was after finding the potential influence of computer assisted language learning on learners' writing enhancement. At the culmination point of the study, the participants in the experimental group were reported to have outperformed those in the control group as a result of being exposed to computer-assisted technique for teaching writing.

In like manner, Al-Qumoul (2005) explored the would-be impact of teaching via instructional software on learners' possible gains in terms of achievement. The sample of the study was composed of 18 students distributed among four groups (two experimental and two control groups). The research findings pointed toward a more notable enhancement occurring among the participants of CALL group who had been exposed to English language functions via CALL lessons compared to control group learners who had followed the traditional method of instruction.

In a similar vein, Rezvani and Ketabi (2011) performed a study to investigate the alternative effects of web-based versus traditional materials on possible gains in learners' grammatical accuracy. A total of ninety intermediate learners

took part in their study. Successive to data analysis, it was revealed that the two experimental groups had outperformed the control group. Based on the obtained results, the researchers concluded that integration of web-based materials with printed materials might help motivate and enhance EFL learners' mastery of English grammar.

Likewise, Marzban (2011) investigated the effect of ICT and more particularly CALL on the enhancement of Iranian university students' reading comprehension skill. The result of his study showed that there was a significant difference between reading comprehension scores of experimental and control groups; in other words, students who were taught by CALL instructional techniques significantly outperformed the ones who were taught by traditional teacher-centered methods.

In another study within the realm of CALL-oriented research, Rezaee and Ahmadzade (2012) delved into the viability of bringing about vocabulary learning enhancement through the integration of Computer Mediated Communication (CMC) and Face to Face Communication (FFC). Though both experimental groups, i.e. CMC and integrated CMC groups, did better than the control group (FFC group) on the posttest, the gains attained by integrated CMC group were considerably more eye-catching than either of the two other groups.

In another attempt, Gorjian (2012) probed the alternative influences of employing web-based and paper-based techniques on Iranian EFL learners' vocabulary retention rate. To commence the investigation, 300 participants were randomly assigned into two homogeneous groups. Successive to pretest, the learners were exposed to twelve expository passages selected from CNN website, and at the end of the course, the participants sat the post-test. Findings revealed the significant effect of web-based language learning approach on the retention of vocabulary in the short term.

Nadeem, Mohsin, Mohsin and Hussain (2012), on the other hand, studied the possible gains in pronunciation resulting from the implementation of CALL-oriented programs. Benefiting from a group of prospective teachers who had enrolled in the teacher education programs, the researchers found that teachers were able to ameliorate their pronunciation of individual sounds as a result of the CALL-based treatment applied.

Finally, within the newly founded domain of mobile assisted language learning (MALL), which can be regarded as an offspring of CALL, Agca and Ozdemir (2013) investigated the effect of multimedia content integrated to learning materials on vocabulary learning. A total of 40 students (who were randomly assigned to two groups) participated in this study. After the application of treatment in two distinct formats (text-based vs. mobile-assisted), the researchers came up with a significant difference between participants' vocabulary learning performance before and after the treatment. In conclusion, mobile assisted learning environment was reported to have increased students' vocabulary knowledge concerning the target words.

A brief glance at the current literature on CALL reveals that almost all previous studies in this domain have been done in an academic setting or among urban high school students, but not among rural high school students, who are deprived of computer-based materials. Therefore, the aim of the present study is to investigate whether computer-based materials have any effect upon EFL high school students' achievement in rural area; in so doing, it also seeks to explore students' attitudes towards using these materials.

## III. METHOD

# A. Participants

The participants in this study were forty-five female rural high school students, studying during the second semester of 2013 at *Golhaye Beheshte Gharabagh* School, Urmia, Iran. The participants' ages ranged from 15 to 18. To cater for equitable language proficiency and homogeneity, thirty out of forty-five students were chosen based on a teacher-made pre-piloted placement test.

# B. Materials

Learn-to-Speak-English Deluxe-10 was used for experimental group. As the participants in this study were unfamiliar with the use of computer and its software, this software was found more appropriate, in that it was a highly effective and easy-to-use language learning software. Furthermore, English Grammar in Digest by Trudy Aronson was used for the control group. Ten parts of this book were chosen for instruction. Prior to applying the treatment to both experimental and control groups, a pre-test was administered to all learners, and following the treatment, the post-test was given. The same researcher-made test with the same contents was used for pre/post test. It must be emphasized that as the tests utilized in this study (as pre- and posttest) were devised by the researchers, they were piloted prior to research and as Cronbach's reliability index for the test was found to be 0.70, the researchers' tailored test was reported to enjoy a satisfactory level of reliability.

## C. Procedure

In order to collect the data, the students participating in the study were asked to meet after the regular class time. They were not informed about the research procedure. When the class started, they were given twenty minutes for answering the pre-test which consisted of thirty items. When the time was up, the students handed their test sheets to the teacher. Those thirty students were divided randomly into two groups of experimental and control. From the very first session, the treatment was applied among two groups with different materials. Computer-based materials, which were presented using fifteen computers with *Learn-to-Speak-English* software installed on them, were used for experimental

group, and print-based materials which encompassed *English Grammar in Digest* textbook were utilized within the control group. Ten weeks (two sessions per week for each point) were devoted for teaching and learning ten grammar points – totally spanning over a two-and-a-half-month period. All the observations were noted down by one the researchers in the current study. Each group was taught the same grammar points by the same instructor. Tag questions, future tense, past-continuous, indirect-questions, present-perfect tense, passive-voice, if conditional, possessive, direct and indirect statements were taught to them in ten consecutive sessions. On completion of those ten sessions, a post test was carried out among both groups at the same time.

## D. Data Analysis

The data were analyzed through utilizing SPSS (version 19), and via running a number of statistical analyses, including paired and independent samples t-tests. To be more specific, paired t-test was employed to address the first and the second research questions. However, to analyze the third research question, independent samples t-test was run.

#### IV. RESULTS

# A. Measures of Central Tendency and Variability

As Table one indicates the mean score of control group obtained on post-test (13.93) is higher than the one gained on the pre-test (9.98); the mean score of experimental group obtained on the post-test (12.20) is also higher than the pre-test (9.27). It can be concluded that the coefficient of variation of the control group (0.27) is higher than that of the experimental group (0.14). As Figure 1 indicates control group's achievement is higher than that of experimental group.

 $\label{thm:computer} Table~1.$  Variation in Learning through Print-based Material and Computer-based Materials

		Variables	Number	Mean	S.D	Coefficient of variation
_	Control	pre-test	15	9.80	2.95	0.30
	Group	Post-test	15	13.93	3.82	0.27
	Experimental	pre-test	15	9.27	1.18	0.13
	Group	Post-test	15	12.20	1.74	0.14

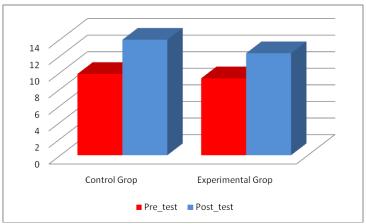


Figure 1. Comparing Pretest and Posttest Results of Control and Experimental Groups

## B. Variation in Classroom Activities of Control Group vs. Experimental Group

The activities assigned to students of control and experimental groups during ten consecutive treatment sessions are presented in Table 2. In this study, the order of presentation of grammar points has been arranged based on high school books arrangement. In the control group, the increase can be seen in the first three grammar points and the last five points, as well. Consequently, items number four and five have inconsistency. In the experimental group, inconsistency in students' scores can be seen among all points. The control group's percentage variation in the grammatical cases is better than that of the experimental group (computer-based materials group) in learning grammar. It can be concluded that it is due to the lack of attention towards learning language among students not owing to treatment.

TABLE 2.
COMPARISON OF CENTRAL TENDENCY AND MEASURES OF VARIANCE OF CLASSROOM LEARNING
GRAMMAR IN CONTROL AND EXPERIMENTAL GROUPS

Questions	Groups	Numbers	Mean	S.D	Coefficient of variation
Past-continuous	Control	15	17.73	4.13	0.23
	Experimental	15	17.00	3.60	0.21
Present-perfect tense	Control	15	17.53	5.48	0.31
	Experimental	15	15.93	4.02	0.25
Future tense	Control	15	16.60	6.11	0.37
	Experimental	15	15.46	3.56	0.23
Conditional	Control	15	10.66	10.32	0.97
Sentence (I)	Experimental	15	15.46	8.45	0.54
Tag question	Control	15	12.53	7.46	0.59
	Experimental	15	14.86	4.15	0.28
Passive voice	Control	15	20.00	0.00	0.00
	Experimental	15	12.06	4.92	0.40
Indirect question	Control	15	15.53	5.69	0.37
	Experimental	15	15.66	2.87	0.18
Direct speech	Control	15	18.00	4.14	0.23
	Experimental	15	14.73	6.35	0.43
Indirect speech	Control	15	17.55	4.00	0.22
	Experimental	15	14.30	5.55	0.38
Possessive	Control	15	19.33	10.33	0.53
	Experimental	15	12.86	8.81	0.68

The comparison of classroom activities of control and experimental groups are indicated in the following figure.

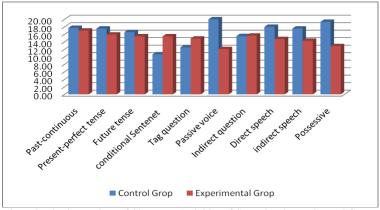


Figure 2. The Comparison of Classroom Activities of Control and Experimental Group

# C. Inferential Statistics

One of the assumptions for employing t-test, a parametric analysis of data, is the normal distribution of the data. Therefore, to meet this assumption the researchers ran a Kolmogrov-Smirnov Test:

TABLE 3.
CENTRAL INDEX AND KOLMOGROV-SMIRNOV TEST

	Variable	Number	Mean	Variance	K.S	Sig.
Control	Pre-test	15	9.80	2.95	0.76	.61
Group	Post-test	15	13.93	3.82	0.66	.76
Experimental Group	Pre-test	15	9.27	1.18	0.63	.81
	Post-test	15	12.20	1.74	0.99	.27

As Table 3 indicates, the *p* values are greater than the level of significance .01. Thus, the null hypothesis is confirmed indicating that the data are normally distributed and can be subject to a parametric analysis.

Hypothesis 1. Using computer-based materials does not have any significant effect on enhancing Iranian EFL learners' grammatical accuracy.

To investigate the first hypothesis, a paired samples-test at .01 level of significance was run. Table 4 indicates that there is a significant difference between the scores obtained on pre- and post-test (p < .01) concerning grammar performance within experimental group. The change in the mean scores obtained by experimental group participants from pretest (M = 9.26) to posttest (M = 12.20), and the significance level of .00, point to significant enhancement in grammatical accuracy of these learners as a consequence of treatment.

TABLE 4.

THE EFFECT OF COMPUTER-BASED MATERIALS ON IMPROVING GRAMMAR WITHIN THE EXPERIMENTAL GROUP

Experimental	Number	Mean	S.D	Paired_Correlation		Paired	Sig
				Correlation	Sig		
pre-test	15	9.26	2.19	0.66	.00	-5.52	.00
pos-test	15	12.20	1.74				

Hypothesis 2: Using print-based materials does not have any significant effect on enhancing Iranian EFL learners' grammatical accuracy.

To investigate the second hypothesis, another paired samples t-test was run. As the obtained p value, .00, is less than level of significance, .01, it can be concluded that there is a significant difference in the scores obtained by control group participants on pretest and posttest (p < .01). As the mean scores of the group using print-based material has changed from 9.80 on pretest to 13.39 on the posttest, it can be stated that significant progress has been made.

 $\label{eq:Table 5.} The \ Effect of Print-based Materials on Improving Grammar$ 

Control	Number	Mean	S.D	Paired_Correlation		Paired	Sig
				Correlation	Sig		
pre-test	15	9.80	2.95	.68	.00	-6.99	.00
pos-test	15	13.93	3.82				

*Hypothesis 3*: There is no significant difference between the uses of computer-based vs. print-based materials for the enhancement of Iranian EFL learners' grammatical accuracy.

To find out the statistical significance of this difference, the researchers employed independent samples t-test. As Table 6 indicates, the obtained significance level, .12, is greater than the p value, .01. This indicates that there is no statistically significant difference between the scores of the two groups. Thus, it can be concluded that the difference between the means of the two groups, 13.93, 12.20, is likely to be attributable to chance element not to treatment per se.

 ${\it Table 6.}$  Independent Samples T-test for Comparing the Scores of Control and Experimental Groups

Post-test	Number	anMe	S.D	Paired_Correlation		Paired	Sig
				Correlation Sig			
Control group	15	13.93	3.83	10.00	.00	1.59	.12
Experimental group	15	12.20	1.74	•		•	

# V. DISCUSSION

## A. Discussion of the Findings Relevant to the First Research Question

The first research question was after probing the effect of implementing computer-based materials on the acquisition of certain grammatical points by Iranian EFL learners. The favorable results gained in this regard lend further support to previous studies using other forms of technology in learning foreign language (Church, 1986; Collentine, 2000; Marzban, 2011; Warschauer & Healey, 1998; Zhuo, 1999). Church (1986) found that computer-assisted instruction provides learners with immediate feedback, since it permits the learners to be evaluated on their answers while questions are fresh in their minds. Warschauer and Healey (1998) stated that, with the advent of the internet and increasing amount of internet use in language learning, its role has been changed from a tool for information processing to a communication tool. Zhuo (1999) concluded that hypermedia-based materials were efficient in grammar teaching and learning. Collentine (2000) maintained that integrating technology into classroom instruction furthered EFL learners' language learning capabilities. Marzban (2011) claimed that ICT can improve teaching and make EFL learners access EFL pedagogy, culturally and linguistically diverse resources, and modern tools to incorporate language and curriculum.

# B. Discussion of the Findings Relevant to the Second Research Question

To investigate the second research question, inquiring whether using print-based materials exerts a significant influence on the acquisition of certain grammatical points by Iranian EFL learners, a paired samples t-test was run. The findings obtained for this research question are inconsistent with what was expected, but no previous relevant findings were found. The findings of this study indicated that using print-based materials had a positive impact on the acquisition of the target form. That is, learners in the control group experienced significant gains in terms of their knowledge of grammatical forms, as suggested by the post-test results.

# C. Discussion of the Findings Relevant to the Third Research Question

Independent samples t-test was applied to investigate the third research question to see whether using computer-based materials vs. print-based materials exerts a significant influence on enhancing grammatical accuracy among Iranian EFL learners. The findings revealed that the use of software program did not noticeably enhance the abilities of the students in the experimental group. In other words, it was found that using print-based materials had a more positive

impact on the learning of the target form than computer-based materials, that is, learners in the control group were characterized by more significant gains in terms of their knowledge of grammatical forms. The findings, thus, appear to be inconsistent with what has been reported in the relevant literature so far. The study findings are inconsistent with the results obtained by some researchers, including Abu-Seileek (2004) who said that the processing group performed significantly better than the traditional group, Al-Qumoul (2005), who emphasized that the computerized method is more beneficial for students than traditional methods, and Rezvani and Ketabi (2011) who claimed that web-based materials are likely to augment learners' motivation and enhance their performance.

## VI. CONCLUDING REMARKS

The purpose of this study was to investigate the impact of computer-based materials vs. print-based materials on enhancing grammatical accuracy among Iranian rural high school students. The research was carried out as an experimental research via applying two different sorts of treatment to two different groups. A glance through the literature revealed that students who were taught via computer-based materials, gained a higher proficiency in foreign or second language learning. The paired samples t-test results indicated that there was a significant difference in the scores obtained by the learners on pre- and post-test (p < .01) within both experimental and control groups. Independent samples t-test results, however, showed that there were no statistically significant differences in the achievement mean scores of the subjects of the experimental group who studied 10 different grammatical points via computer and the control group who studied the same grammatical items using the traditional method. When comparing the results of this study with the findings of other relevant probes, one can see that this study is inconsistent with many prior empirical studies which were conducted.

As examined in this study, a number of factors have made it difficult for CALL to be integrated into English teaching classrooms in Iranian rural education settings. One of the main reasons behind the inconsistency of the obtained results with the previous studies might be lack of access to computers, poverty and low socioeconomic conditions for rural students in their homes, plus the lack of opportunities for students to use the computers during school hours. This is due to the fact that instructors have a low amount of knowledge regarding computerized methods of instruction, and authorities are highly negligent concerning English language teaching issues. It is obvious that computer has a lot of functions, and students at this age are very curious to discover other things than getting focused on language lessons. In the light of this, it can be concluded that the main source of problem in rural settings is not students themselves since they are intelligent enough and highly motivated to utilize and apply computerized methods, materials, and instructions.

# VII. IMPLICATIONS AND RECOMMENDATIONS FOR FURTHER STUDIES

Based on the findings of the study, the researchers suggest that educational authorities had better:

- 1. make rural students familiar with how to use computer-based materials and computerized methods prior to implementing CALL program;
  - 2. provide funding to meet the costs of upgrading electrical services to schools;
  - 3. train teachers on how to apply the technology and how to integrate it into the curriculum;
- 4. recommend teachers and instructors to vary their methods, techniques and ways of teaching, according to their students' needs and interests;
- 5. include courses in special methodology in language teaching with updated topics in computer-assisted language learning; and
- 6. equip all schools even rural schools with high quality teaching materials such as computers, projectors, smart boards, etc.

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