

IMPACT OF WEB-BASED INTERVENTION IN A WRITING CLASSROOM

S. Vijayakumar* and A. Shahin Sultana*

This study examines the impact of web based instruction for improving the grammatical competency in writing. A comparative analysis of web based instruction versus face to face instruction is made. The paper initially deals with a brief review of literature from prominent journals pertaining to web based instruction. Pavio's dual coding theory was used as a theoretical base of the study. The performance of the learners before and after intervention was analyzed using a paired 't' test. The results indicated statistically significant improvement after web based intervention.

Key words: Intervention study, web based instruction, L2 writing, dual coding theory

INTRODUCTION

According to (Smits, 2009) teachers do not adequately prepare to teach writing at university level. Though there are ample intervention studies in L2 writing the effect of web-based intervention for improving grammatical competency in writing has not been studied so far. The impact of technology in enhancing the learning outcomes is not fully realised. (Higgins, Mercier, Burd, & Hatch, 2011). There are empirical studies on the impact of technologies for fostering learning. But, evidence based studies that report on writing pedagogy and web-based intervention are sparse. The fundamental problem in writing pedagogy is the use of conventional materials. (Udo, Bagchi, & Kirs, 2011) claim that web based resources can significantly enhance learning. (Rose, Clark, Samouel, and Hair, 2012) observe that the learners significantly improve affective and cognitive aspects in a web based learning environment. The effectiveness of web based instruction could be attributed to the intrinsic motivation of the learners which in turn would help learners to perform well in classrooms. (Lee, 2010). When the learners are given internet access in writing classrooms it may provide exceptional opportunities to enhance writing their skills (Kenworthy, 2004). However, web based instruction is not without its share of criticism. Wu, Franken and Witten (2009) remark that web based instruction may not help the learners to improve the grammatical competency. Graham and Perin (2007) and Graham, McKeown, Kiuahara, and Harris (2012) in their Metanalysis on writing intervention research have concluded that grammar instruction did not have a positive result in text quality. This notion is challenged in this paper by suggesting a web based intervention programme for teaching writing with a special

* Department of English. B.S. Abdur Rahman University, Chennai-600048, Tamilnadu, India, E-mail: mailmevijay73@gmail.com

focus on improving the grammatical resource. Unless an intervention study is carried out the effect of web-based instruction for improving grammatical resource cannot be understood. To address this lacunae this study was commissioned.

THEORETICAL BACKGROUND

The theoretical base of the study is based on the principles of dual coding theory. Alan Pivio postulated dual coding theory. According to Pivio mental images fosters the learning process. The evidence based support for this theory is found in his other works. (Paivio 1971, 1986, 1991, 2007). The efficacy of dual coding theory in composition writing is articulated by (Sado-ski & Paivio, 2004). "The positive impact of dual coding theory is empirically proven" (Bucci 1985, p.571). But the impact of dual coding theory on written skills is not carried out before. Visual impact and verbal information are indispensable for effective reception of information (Sternberg, 2003). Dual coding theory can be effectively applied in a web based learning environment. Learners' who are exposed to dual channels of information i.e. both visual and verbal can also recall information effectively. (Brunye, Taylor, & Rapp, 2008). In accordance to the principles of dual coding theory the target learners were given both auditory input and visual input during instructional phase.

METHOD

Design

An experimental design was employed in the study. A single group pretest posttest design was implemented. After traditional instruction the participants were exposed to a performance test. After web based intervention the same set of students was exposed to a posttest. Informed consent was obtained from the participants and they were instructed on the details of the study.

Participants

The participants were 21 students in their second year from electronic and communication engineering from B.S.Abdur Rahman. (Mean age 18.62 years; SD=0.42 years.) There were 14 boys and seven girls in the group.

Classroom setting

In method one face to face instruction took place in the classroom. Writing and grammar tasks were predominantly pen and paper based. Chalk board and the course book were the instructional materials used. In method two the learners were exposed to web based instruction. It was conducted at the multimedia lab which has 30 networked systems with internet connectivity and head phones.

Research questions

To what extent does web based instruction improve the grammatical resource during writing skills?

To what extent is there a difference between students who are exposed to traditional classroom instruction compared to web based grammar instruction?

Hypotheses

The 'null hypothesis' is:

H0: There is no difference in mean before and after the intervention.

The 'alternative hypothesis' is:

H1: There is a discernible difference in the mean values of pre-test- and post-test-marks

Procedure and tasks used in the study

As mentioned earlier there were two phases in the study. The first phase is the conventional method and the second phase is web based instruction.

Phase-1: During the conventional method the participants were exposed to face to face instruction and blackboard instruction on grammar components such as modal verbs, phrasal verbs, prepositions, articles, tenses, passive constructions and relative clauses spread over a period of 6 hours on different days. There were instructed on how to use them in writing. Pen and paper based tasks on usage of these grammar components were given. These grammar components were chosen because they are indispensable for accurate writing. After the instructional phase they were asked to write an essay on child labour. Their test performance was coded as before intervention scores.

Phase-2: The same group was exposed to web based instruction for a period of 6 hours. They had online practice on the same grammar components. They were also exposed to audio based online tutorials on the use of these grammatical components. A screen shot of the web based task is given below. The principle of dual coding theory is applied during web based instruction. Web based content was delivered using dual modes i.e. visual as well as verbal.

According to (Warnock, 2009) teaching online writing offers new ways to apply theoretical and pedagogical concepts about writing. After web based instruction the participants were asked to write an essay on the advantages and disadvantages of education abroad. The improvement in the students' writing output was observed after web based instruction. The performance of both the conditions was compared. Their essays were evaluated based on grammatical resource. Other variables such as content, cohesion and vocabulary were not considered for assessment as they were not taken as variables for the study.

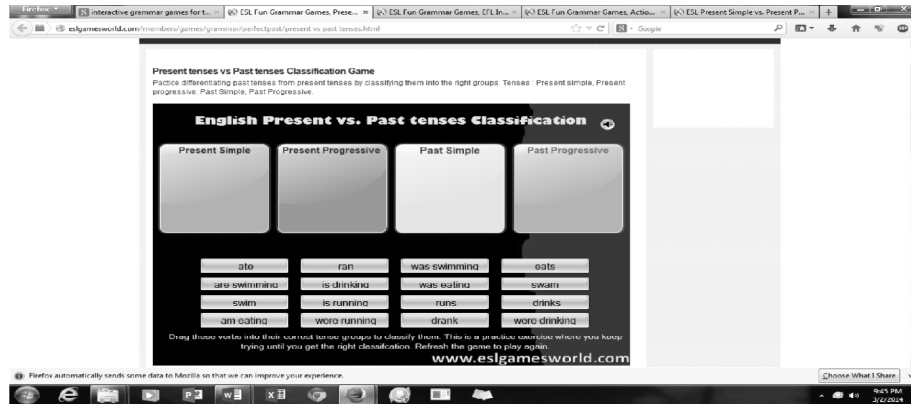


Figure 1: Screen shot of web based classroom.

Source: <http://eslgamesworld.com/grammar/tenses>

Evaluation criteria

Number of grammatical errors in both the pre-test and post-test was assessed. The IELTS writing band descriptors for grammar was adopted for evaluation. Based on their performance the students were awarded a maximum of 9 points and a minimum of 1 point. The writing band descriptors are given in the table below.

TABLE 1: BAND DESCRIPTORS FOR ASSESSING GRAMMATICAL RANGE

Band	Grammatical Range & Accuracy
9	Uses a wide range of structures with full flexibility and accuracy; rare minor errors occur only as slips.
8	Uses a wide range of structures; The majority of sentences are error-free; Makes only very occasional errors or inaccuracies.
7	Uses a variety of complex structures; Produces frequent error-free sentences; Has good control of grammar and punctuation but may make a few errors
6	Uses a mix of simple and complex sentence forms; Makes some errors in grammar and punctuation but they rarely reduce communication
5	Uses only a limited range of structures ; Attempts complex sentences but these tend to be less accurate than simple sentences; May make frequent grammatical errors and punctuation may be faulty; errors can cause some difficulty for the reader
4	Uses only a very limited range of structures with only rare use of subordinate clauses; Some structures are accurate but errors predominate, and punctuation is often faulty
3	Attempts sentence forms but errors in grammar and punctuation predominate and distort the meaning
2	Cannot use sentence forms except in memorised phrases
1	Cannot use sentence forms at all

Adapted from: <https://takeielts.britishcouncil.org>

ANALYSIS OF RESULTS

To structure the analysis the research question is presented again.

Research question: To what extent is there a difference in performance before and after intervention?

The comparison of scores of two different treatments among the 21 samples and the difference in scores are presented below. Average difference, mean, standard deviation and paired ‘t’ test are used to compare the means of two samples.

TABLE 2: MARKS TABULATION BEFORE AND AFTER INTERVENTION

<i>Sample</i>	<i>Before intervention</i>	<i>After intervention</i>	<i>Difference</i>
1	4	6	2
2	7	9	2
3	6	8	2
4	6	6	0
5	4	7	3
6	7	5	-2
7	6	9	3
8	4	5	1
9	6	6	0
10	4	7	3
11	5	4	-1
12	7	7	0
13	4	7	3
14	5	8	3
15	7	9	2
16	6	8	2
17	6	9	3
18	4	7	3
19	5	6	1
20	4	8	4
21	3	6	3
Mean	5.24	7.00	Diff -1.76

The table indicates that in most of the cases there is an improvement in the mean scores. However in three candidates there is no difference in mean. Strangely, in two candidates the test scores have come down after intervention. But, the overall mean scores typify discernible improvement after multimedia intervention. The difference in test performance is visually represented in the bar chart below.

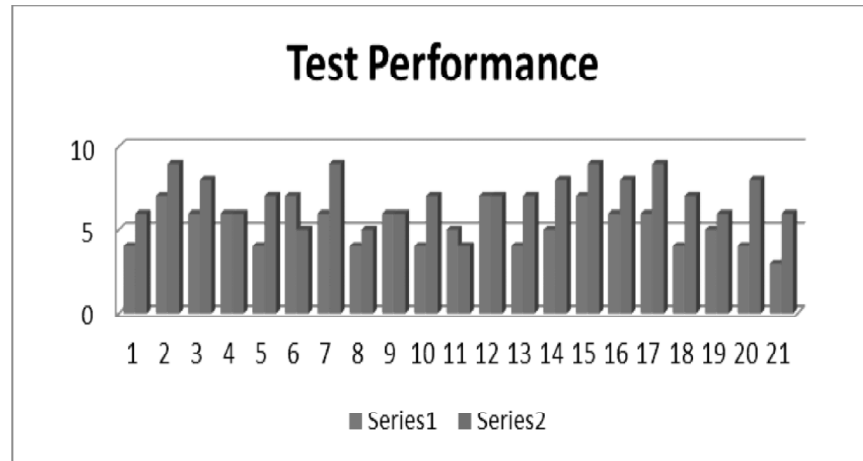


Figure 2: Comparison before and after intervention

Since the mean scores alone do not exemplify test validity a paired sample 't' test was run using statistical package for social sciences (SPSS) version 15. The results of the SPSS output are presented in table 3 and 4.

TABLE 3: PAIRED SAMPLE STATISTICS

<i>Pair-1</i>	<i>Mean</i>	<i>N</i>	<i>Std. Deviation</i>	<i>Std. Error Mean</i>
Method-1	5.24	21	1.26	0.28
Method-2	7.00	21	1.45	0.32

TABLE 4: RESULTS OF PAIRED SAMPLE 'T' TEST

<i>Pair-1</i>	<i>Paired differences</i>		<i>95% confidence interval of difference</i>		<i>t</i>	<i>df</i>	<i>Sig 2 tailed</i>
	<i>Mean</i>	<i>Std. Error Mean</i>	<i>Lower</i>	<i>Upper</i>			
<i>Before Intervention</i>							
<i>After Intervention</i>	-1.76	0.344	-2.48	-1.04	5.1162	20	0.0001

Paired 't' test results

Table 3 exemplifies the overall mean average and standard deviation of method one and method two. The overall mean average of method one is 5.24 with a standard deviation of 1.26. The mean average for method two it is 7.00 with a standard deviation of 1.45. Table-4 indicates the paired differences, 95% confidence interval of difference and the two tailed value. The mean of group one minus group two equals -1.76. 95% confidence interval of this difference is -2.48 to -1.04.

Intermediate values used in calculations

$t = 5.112$

$df = 20$

Standard error of difference = 0.344

The two tailed P value is 0.0001. According to the 't' test parameters this difference is considered to be statistically significant.

DISCUSSION

The aim of this study was to explore the efficacy of web based instruction for improving writing skills. To determine the impact of intervention the researcher conducted a pre-test post-test intervention study with a sample size of 21. The results indicated that the intervention is effective as there was a significant improvement in the marks of the post-test compared to the pre-test. Furthermore, the evaluation was precisely measured using the IELTS band descriptors. Lancaster (2014) claims that learning communities working in a web based environment improve their writing skills. The study also supported the premise of the dual coding theory which states that information presented through visual and auditory channels are efficacious than single channel input. (Moreno, & Mayer, 1999). The results of the 't' test analysis also demonstrates the significance of the intervention.

However there are number of limitations in the study that need to be addressed. They are

- i) The reason for the improvement could also be due to student's preference to work in an online environment.
- ii) The findings of this study are confined to the university level and cannot be generalised.
- iii) The samples of this study are chosen from a single institution. The efficacy of this intervention could be tested under varied demographics.
- iv) There was only one post observation. Subsequent observation and delayed post-test would have yielded different results.
- v) The small sample size of 21 is also another limitation in the study.
- vi) There is only one group for the study. A true experimental design with a control group and an experimental group would result in a different outcome.

It is assumed that web-based intervention studies in writing pedagogy using a strong theoretical background will address the deficiencies in L2 writing. Since a delayed test was not conducted the long term effects of the intervention programme could not be assessed. Future researchers can explore ways to optimally exploit the web to enhance the writing skills. The study could be replicated using a cross-sectional or a longitudinal study with a larger sample. Despite the limitations and

shortcomings intervention studies of this kind could address the lacunae in L2 writing pedagogy.

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