

EFL Learners' Writing Accuracy: Effects of Direct and Metalinguistic Electronic Feedback

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Abstract—The present study investigated the effects of direct and metalinguistic electronic feedback (E-feedback) on Iranian EFL learners' writing accuracy and attitudes toward computer assisted language learning (CALL). Twenty nine students in two intact English writing classes comprised the participants of the study. A mixed-method design was used for data collection and analysis. In addition to the instruction provided similarly in both classes, based on random assignment, the students in one group received direct electronic corrective feedback (DECF) using Ginger software. In the other class, the students received metalinguistic electronic corrective feedback (MECF) in the form of error codes provided through Markin4 software. Results revealed that the use of E-feedback developed the learners' writing accuracy and attitudes toward CALL. However, there were no significant differences between the final overall writing accuracy scores of the DECF and MECF groups and their gain scores. Regarding writing accuracy components (i.e., structure, vocabulary, and punctuation), although the MECF group obtained higher scores in three components, a statistically significant difference between the two groups was found only in terms of vocabulary gain scores. Finally, in the interviews, the students in both groups referred to some barriers in the implementation of CALL in their context as well as some of its merits.

Index Terms—writing accuracy, corrective feedback, direct and metalinguistic feedback, electronic feedback, CALL

I. INTRODUCTION

A. Background

Simultaneous with globalization of English, it is becoming the most significant language for circulating academic knowledge, and scholars in most disciplines tend to publish their articles and journals in English rather than their own languages (Swales, 1997). Hyland (2003, p. xiii) highlights the importance of second language writing by stating that “the ability to communicate ideas and information effectively through the global digital network is crucially dependent on good writing skills”. Thus, as Olshtain (2001) emphasizes, learners' ability to communicate through writing has to be enhanced throughout their education. Given the role of writing courses in this regard, writing assignments and feedback as two integral constituents of every writing course (Kroll, 2001) merit special attention.

According to Sheen and Ellis (2011, p. 593), “Corrective feedback refers to the feedback that learners receive on the linguistic errors they make in their oral or written production in a second language”. However, there is disagreement among researchers regarding effectiveness of feedback. Some researchers challenge the concept of corrective feedback and believe that it has no effect on language development (Hillocks, 1982; Truscott, 1996, 1999; Truscott & Hsu, 2008). In contrast, some others consider it a helpful activity in writing classes which promotes students' language skills (Bitchener, Young, & Cameron, 2005; Ellis, 2009; Hyland, 2003; Krashen & Selinger, 1975; Sheen & Ellis, 2011).

Ellis (2009), an advocate of corrective feedback, presented a typology of corrective feedback. Regarding the way errors may be treated, he makes a distinction between direct, indirect and metalinguistic feedback. If the correct form is provided, the feedback is referred to as direct feedback whereas indirect feedback is said to occur when the error is indicated with or without identification of the exact location. Metalinguistic feedback incorporates identification of error through error codes or short grammatical explanation.

Researchers have explored the effectiveness of direct and indirect feedback (e.g., Sachs & Polio, 2007; Sheen 2007) and have come to contradictory findings. As for metalinguistic feedback, although some researchers have shown that metalinguistic feedback in general (Chuang, 2005; Ellis, 2008; Nagata, 1993; Sheen, 2007) or metalinguistic feedback with annotation tools (Yeh & Lo, 2009) is an effective type of feedback, some others believe that students may lack the necessary linguistic knowledge (Ferris & Roberts, 2001) and time (Ellis, 2008) to correct themselves.

A review of the literature shows that studies have often focused upon traditional forms of feedback such as written and oral feedback. Nonetheless, recently “with the development of new technologies, there has been an attendant interest in applying these technologies in the educational arena, and in making predictions of how they would affect the educational future of our classrooms and students” (Sokoli, 2001, p. 477). As for writing, according to Ware and

Warschauer (2006), “points of contact between technology and second language writing converge on the concept of electronic feedback” (p. 3). With the advent of the internet and improvements in technology, students’ writings have recently been commented on using electronic corrective feedback.

In parallel with the introduction of electronic feedback (E-feedback), various types of technologies have been implemented in second language writing classes in order to examine their value in increasing the efficiency of feedback. Indeed, the last decade or so has seen a surge of interest in the study of electronic email (e.g., Selim & Ahmed, 2009; Trenchs, 1996), internet feedback (e.g., Tuzi, 2004), online materials (e.g., Tseng & Liou, 2006), electronic whiteboards (e.g., Hewett, 2006), online writing centers (e.g., Opdenacker & Waes, 2007), electronic feedback (e.g., Nagata, 1993, 1997; Tuzi, 2004), computer mediated communication (e.g., Sun, 2009), blogs (e.g., Montero-Fleta & Perez-Sabater, 2010; Plamquist, 2003; Tan, Ng, & Saw, 2010;), wikis (e.g., Plamquist, 2003), forums, blogs, and wikis (e.g., Miyazoe & Anderson, 2010), online feedback annotation (e.g., Yeh & Lo, 2009), and toolkits (e.g., Milton & Cheng, 2010). A considerable number of these studies revealed that the use of online materials and electronic tools helps students to better improve their writing skill, to be involved in authentic language use, to improve their self-management and control their learning, and to improve the quality of their texts (e.g., Hewett, 2006; Opdenacker & Waes, 2007; Takayoshi, 1996; Tan, Ng & Saw, 2010; Trenchs, 1996; Tseng & Liou, 2006; Tuzi, 2004).

Nonetheless, an important point worth considering before implementing CALL activities in classes is students’ attitudes toward the use of technology for completing their activities. Although the results of researches have shown that students and teachers generally indicated positive attitudes toward CALL (Baloglu & Cevik, 2008; Greenfield, 2003; Kelm, 1998; Liaw, Huang & Chen, 2007; Mokhtari, 2013; Rahimi & Hosseini, 2011; Rahimi & Yadollahi, 2012; Smith, 2000; Stevens, 1991; Warschauer, 1996), the findings have also revealed some barriers such as lack of time, lack of technical and theoretical knowledge, financial barriers, and students and teachers’ lack of training in implementing CALL in language classes (Daly, 2003; Ismail, Almekhlafi & Al-Mekhlafy, 2010; Kim, 2002; Lee, 2000; Riasati, Allahyar, & Tan, 2012).

B. Objectives and Research Questions

To add to the body of knowledge gained from the literature available on the issue, this study attempts to examine the efficacy of using softwares in providing Iranian EFL learners with metalinguistic electronic corrective feedback (MECF) and direct electronic corrective feedback (DECF), and to explore the students’ attitudes toward the use of CALL in writing. Based on the foregoing points, the present study attempts to answer the following research questions:

1. Does the corrective feedback offered to the DECF and MECF groups result in the Iranian EFL learners’ writing accuracy development?
2. Is there any significant difference between the effects of DECF and MECF on Iranian EFL learners’ writing accuracy improvement?
3. Do students in the DECF and MECF groups differ in terms of improvement in accuracy components (i.e., structure, vocabulary, and punctuation)?
4. Which intervention (DECF or MECF) is more effective in fostering positive attitudes toward the use of CALL in writing among students?
5. What are the participants’ opinions about E-feedback?

II. METHOD

A. Participants

A convenient sample of 29 Iranian male and female EFL learners took part in the study. They were sophomore students majoring in English Language and Literature who had already enrolled in two classes. Both groups participated in a Paragraph Writing course which was held for about two hours every week for a semester. The students in the two classes were at upper intermediate level based on the results obtained from Oxford Quick Placement Test (Oxford University Press, 2001). The homogeneity of the two groups in terms of language proficiency was assured based on the results of the same test ($t(27) = .659$, $\text{Sig} = .516$). The two intact classes were randomly assigned to either of the two treatment groups, DECF and MECF groups.

B. Instruments, Softwares and the Scale

1. Writing Tests

Two writing tests similarly administered in both classes at the beginning and at the end of the course functioned as the pretest and posttest, respectively. It was attempted to choose two similar topics for the two tests so that the difficulty of the tasks would be kept constant. The pretest informed the researchers of (the homogeneity of) the writing ability of the students in the two groups before the treatments and the posttest indicated their ability after the treatments. The comparison between the students’ performances on the pretest and the posttest could show the efficiency of the treatments in improving the students’ writing accuracy.

2. The CALL Attitude Questionnaire

To investigate the students’ attitudes toward CALL before and after the treatments, the CALL attitude questionnaire validated by Vandewaeterea and Desmet (2009) was used as a base draft. It assesses EFL learners’ attitudes toward

CALL through 20 items scored on a seven-point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). The present researchers revised, and adapted this questionnaire to address the students' attitude toward the use of computers in learning to write and, thus, developed a questionnaire which was appropriate for the purpose of the study. The revised questionnaire (henceforth briefly referred to as the CALL questionnaire) consists of 32 items related to the use of computers, technology and software in writing. The internal consistency of the questionnaire estimated through Cronbach's alpha was 0.82 which was satisfactorily high for the purpose of the study.

3. Interviews

In order to find out about the students' opinions about E-feedback, a series of semi-structured interviews was carried out at the end of the treatments. These interviews were conducted by the first researcher in the participants' native language, Persian, so that the students could express their ideas with ease. Out of 32 students in the two groups, 12 were selected (six students from each of the DECF and MECF groups) through purposive sampling procedure. In order to select the interviewees, the students were categorized into three bands based on their writing ability as indicated in the posttest, and from each band two participants were selected randomly for the interview to make sure that the ideas of the students with various writing abilities would be taken into consideration. The questions asked were about the students' opinions about electronic feedback and their preferences regarding electronic feedback or teacher feedback.

4. Computer Softwares

Two computer softwares were employed in the present study to provide the participants with electronic corrective feedback on the accuracy of their writing: Ginger and Markin4. Ginger (Karov & Zangvil, 2007), a free grammar, punctuation and spell checker software dealing with natural language processing (NLP), is an online service. The program checks and corrects punctuation and spelling mistakes, misused words and grammar mistakes in accordance with the context of the full sentence in which they are used (Wikimedia Foundation, Inc., 2013). Therefore, this software was used to provide direct electronic corrective feedback in the DECF group. Markin4 (Creative Technology, 2013) is a Windows program that provides a comprehensive set of tools enabling the teacher to mark and annotate the text, and give comments and feedback to the students; hence, the software was employed to provide metalinguistic electronic corrective feedback in the MECF group.

5. The Scoring Scale

According to Weigle (2002), one of the important components of writing assessment is the scoring scale since it "represents the most concrete statement of the construct being measured" (p. 72). In this study, the researchers used an adapted version of the essay rating scale developed by Paulus (1999). Since the course the students were participating in was intended to develop their ability to write effective paragraphs, not essays, some of the criteria mentioned in the rubric were slightly revised in a way that the scale would fit assessment of paragraphs. The scoring scale, designed on a ten-point scale, incorporates both macro and micro level criteria. Based on this scoring scale, both groups were similarly assessed and also received feedback on macro level criteria. However, though their writings were also similarly evaluated based on the micro level criteria in the same scale, the students in either group received the respective type of feedback on their writing accuracy with reference to the same criteria.

C. Data Collection Procedure

Before the inception of the instruction and the treatments, the students in both classes were given a writing task with the same topic employed as the writing pretest. The overall writing accuracy scores of the two groups were subjected to an independent samples t-test, the results of which confirmed the homogeneity of the two classes in terms of overall writing accuracy ($t(27) = .178$, $Sig = .760$). Subsequently, the classes were randomly assigned to the DECF group, who received instruction on writing and direct feedback (on their writing accuracy) generated through Ginger, and the MECF group, who, in addition to similar instruction on writing, received electronic metalinguistic feedback through Markin4. In addition to the writing pretest, on which the participants received no feedback, and some preliminary activities and assignments such as freewriting, brainstorming, outlining and writing topic sentences, the students were given nine topics on which they had to write paragraphs (of no more than 200 words) and practice different techniques of support and methods of development instructed each session during the semester.

The researchers, using either of the two softwares for the respective group, provided the students with feedback on accuracy of their nine writing assignments (regarding micro-level aspects of their writing such as grammar, spelling, and punctuation) as well as feedback on the macro level aspects (such as content and organization) which was done similarly in both groups. The students in both groups were supposed to revise their texts based on the feedback they had received and hand them in the next session.

At the end of the course, the students were given the posttest writing task which, similar to the pretest writing task, was identical in both groups. Furthermore, the researchers administered the CALL questionnaire before the commencement of the course and at the end of the course in order to explore the students' attitudes toward the use of computers and softwares for improving their writing ability. The interviews were conducted at the end of the semester and took about 10 minutes for each student. The interviews were recorded and transcribed for further analysis.

D. Data Analyses

At first, descriptive statistics of the students' overall writing accuracy scores on the writing pretest and posttest, as well as the CALL questionnaires were obtained. Then the two groups' overall writing accuracy scores on the writing

pretest and posttests were compared using a mixed between-within subjects analysis of variance (ANOVA) in order to see whether there was any statistically significant difference between the performance of the students in the DECF group and that of the MECF group. In addition, to gain a more comprehensive picture of the performances of the students in the two classes, their overall writing accuracy gain scores from the pretest to the posttest tasks were also computed using an independent samples t-test

Moreover, a one-way between-groups multivariate analysis of variance (MANOVA) was performed to investigate the difference between the DECF and MECF groups in terms of the components of writing accuracy (i.e., structure, vocabulary, and punctuation). To avoid type 1 error due to multiple comparisons, Bonferroni adjustment was done when considering the results of tests of between-subjects effects. Then the participants' responses to the CALL attitude questionnaires administered before and after the treatments were analyzed to determine if there were any changes in the students' attitude toward CALL in writing as a result of the treatments. A mixed between-within subjects ANOVA was run to make intra- and inter-group comparisons between the learners' attitudes toward CALL before and after the treatments.

III. RESULTS OF DATA ANALYSES

A. Evaluation of Efficiency of DECF and MECF in Improving Students' Overall Writing Accuracy

Descriptive statistics were first obtained in order to examine the value of DECF and MECF in improving the students' overall writing accuracy. According to Table 1, both groups appear to have made improvement in overall writing accuracy as a result of the type of feedback offered (DECF: Pretest M=9.27, Posttest M=18.18; MECF: Pretest M=9.11, Posttest M=19.72).

TABLE 1.
DESCRIPTIVE STATISTICS FOR PRETEST AND POSTTEST OVERALL WRITING ACCURACY SCORES

Writing task	Group	N	Mean	Min	Max	Min Possible	Max Possible	SD
Pretest	DECF	11	9.27	7	16	0	30	3.16
	MECF	18	9.11	7	13	0	30	1.74
Posttest	DECF	11	18.18	8	24	0	30	4.60
	MECF	18	19.72	15	23	0	30	2.27

However, in order to statistically examine the differences in the two groups' performances, a mixed between-within subjects analysis of variance (ANOVA) was conducted. Before, examining the results, preliminary assumption testing was conducted to check for homogeneity of inter-correlations and variances; no serious violations were observed.

As the results in Table 2 indicate, there was not a significant interaction between time and group (i.e., different treatments) (Wilk's Lambda=.956, $F(1, 27) = 1.256$, $Sig = .272$, Partial eta squared=.044), meaning that in the course of time the two experimental groups' development in overall writing accuracy did not show much difference. As for the impact of the two types of treatment, similarly, the effect was not significantly different ($F(1, 27) = .734$, $Sig = .399$, Partial eta squared=.026), suggesting no difference in the effectiveness of the two feedback types (i.e., DECF and MECF) in improving the students' overall writing accuracy. However, there was a significant main effect for time (Wilk's Lambda=.140, $F(1, 27) = 165.204$, $Sig = .000$, Partial eta squared=.860) which shows that both groups greatly improved their overall writing accuracy over time and the effect of time, as indicated by the effect size, was large (Cohen, 1988).

TABLE 2.
RESULTS OF MIXED BETWEEN-WITHIN SUBJECTS ANOVA FOR PRETEST AND POSTTEST OVERALL WRITING ACCURACY SCORES

Mixed-between-within ANOVA							
Multivariate tests (of within subjects effect)	Effect	Wilk's Lambda value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
	Time	.140	165.204	1	27.000	.000	.860
	Time*Group	.956	1.256	1	27.000	.272	.044
Tests of between- subject effect	Group	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
		6.490	1(27)	6.49	.734	.399	.026

A comparison between the improvement in overall writing accuracy of the students in the two groups over time is graphically depicted in Fig.1. As it is shown in the figure, the students in the MECF group apparently showed a better performance than their counterparts in the DECF group over time; however, as mentioned before, the results displayed in Table 3 showed no statistically significant difference between the performances of the students in the two groups in terms of overall accuracy in writing.

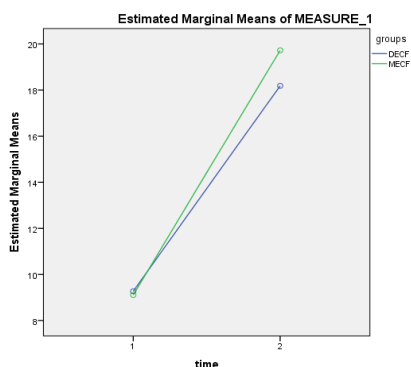


Figure 1. Comparison of Pretest (1) and Posttest (2) Accuracy Scores of the DECF and MECF Groups

Since the dispersion of overall writing accuracy scores of the DECF as compared with the MECF group in both pre- and posttests (Pretest: DECF=3.16, MECF=1.74; Posttest: DECF=4.60, MECF=2.27) considerably differed, it could be inferred that the students in the two groups did not homogeneously make improvement in writing accuracy. Therefore, the odds were that this may have affected the results of the mixed between-within subjects ANOVA. In order to scrutinize the issue further, writing accuracy gain scores (from pretest to posttest) of individual students in both groups were computed and compared using an independent samples t-test. As the results in Table 3 indicate, the mean accuracy gain score of the students in the MECF group (M=10.6, SD=2.91) was higher than the mean gain score of the students in the DECF group (M=8.91, SD=5.30); however, there was not a statistically significant difference between the gain score means of the two groups ($t(27) = -1.12, Sig = .27$). This suggests that the development in the overall writing accuracy of the two feedback groups was almost similar and, hence, MECF and DECF were equally effective in this regard.

TABLE 3. DESCRIPTIVE STATISTICS FOR THE DECF AND MECF GROUPS' WRITING ACCURACY GAIN SCORES AND RESULTS OF INDEPENDENT-SAMPLES T-TEST

Group	N	Mean	SD	t	df	Sig. (two-tailed)
DECF	11	8.91	5.30	-1.12	27	.272
MECF	18	10.6	2.91			

B. Evaluation of Efficiency of DECF and MECF in Improving Students' Writing Accuracy Components

Another objective of the research was to explore how the two types of electronic feedback on learners' writing accuracy affected different components of accuracy (i.e., structure, vocabulary and punctuation) in their writing. In order to see the improvement of the DECF and MECF groups in terms of the components of writing accuracy, their gain scores in each of the components were computed and then a one-way Multivariate Analysis of Variance (MANOVA) was performed. The students' gain scores on the three components of writing accuracy under study comprised the dependent variables and group (i.e., the type of treatment offered: DECF and MECF) served as the independent variable. Preliminary assumption testing was run to check for normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, and multicollinearity; no serious violations were observed.

TABLE 4. RESULTS OF MANOVA FOR THE TWO GROUPS' GAIN SCORES ON THE WRITING ACCURACY COMPONENTS

	Value	F	Hypothesis df	Error df	Sig.	d
Group	.652	4.44	3	25	.012	.348

As Table 4 presents, there was a statically significant difference between the DECF and MECF groups on the combined dependent variables ($F(3, 25) = 4.44, Sig = .012$; Wilks' Lambda = .652), and the effect size was found to be large ($d = .348$) (Cohen, 1988). To further investigate the difference in relation to each dependent variable, the results of Tests of Between-Subjects Effect were examined.

A Bonferroni alpha adjustment was run to get to an experiment-wise alpha rate. The alpha level (.05) was divided by 3 to reach an acceptable confidence level for each of the three components. The adjusted alpha level was $p < .017$. When the results of the follow-up tests for the dependent variables were examined, the only difference to reach statistical significance was the difference observed in gain scores obtained on vocabulary ($F(1, 27) = 9.36, Sig = .005, Partial \eta^2 = .258$).

TABLE 5.
RESULTS OF TESTS OF BETWEEN-SUBJECTS EFFECTS FOR DECF AND MECF GROUPS' GAIN SCORES ON WRITING ACCURACY COMPONENTS

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Groups	Structure	.759	1	.759	.788	.383	.028
	Vocabulary	7.97	1	7.97	9.36	.005	.258
	Punctuation	.435	1	.435	.415	.525	.015

Further analysis of the mean gain scores indicated that the students in the MECF group obtained higher vocabulary gain scores ($M=3.44$, $SD=2.17$) than the students in the DECF group ($M=2.36$, $SD=.278$). Although the students in the MECF group had better performance in both structure ($M=3.33$, $SD=.231$) and punctuation ($M=3.88$, $SD=.241$) than the students in the DECF group (Structure, $M=3.00$, $SD=.296$, Punctuation, $M=3.63$, $SD=.309$), there was not a statistically significant difference between the DECF and MECF groups' mean gain scores in structure ($F(1, 27)=.788$, $Sig=.383$) and punctuation ($F(1, 27)=.415$, $Sig=.525$).

C. Assessment of the DECF and MECF Groups' Attitudes toward CALL

As mentioned before, to investigate the participants' opinions about the use of computers and technology in writing, the students in both groups were asked to answer the CALL questionnaire both before and after the treatments. Table 6 displays the descriptive statistics for both pretest and posttest CALL questionnaires for the DECF and MECF groups. According to the table, the students held nearly positive attitudes toward CALL in both the DECF ($M=4.95$, $SD=.689$) and MECF ($M=5.10$, $SD=1.21$) groups before the treatments. After the treatments, similarly, the students in the DECF ($M=5.13$, $SD=.904$) and MECF ($M=5.13$, $SD=1.03$) groups held positive attitudes too.

TABLE 6.
DESCRIPTIVE STATISTICS FOR CALL ATTITUDE QUESTIONNAIRE PRETEST AND POSTTEST

Questionnaire	Group	N	Mean	Min	Max	Min Possible	Max Possible	SD
Pretest	DECF	11	4.95	3.50	6.22	0	7	.689
	MECF	18	5.10	2.03	6.63	0	7	1.21
Posttest	DECF	11	5.13	3.84	6.41	0	7	.904
	MECF	18	5.13	2.53	6.28	0	7	1.03

In order to explore the significance of changes in the students' attitude toward CALL, a mixed between-within subjects analysis of variance (ANOVA) was conducted. Assumptions of homogeneity of inter-correlations and homogeneity of variances were checked and the results showed no serious violations.

Table 7 presents the results of the mixed between-within subjects ANOVA. As the results indicate, there was not a significant interaction between time and group (i.e., different treatments) (Wilk's Lambda=.997, $F(1, 27) = .074$, $Sig=.787$, Partial eta squared=.003), meaning that in the course of time the two groups' attitude toward CALL did not show much difference. As for the impact of the two treatments, the effect was not significantly different ($F(1, 27) = .071$, $Sig=.791$, Partial eta squared=.003), suggesting no difference in the two groups' attitudes toward CALL. Similarly, there was not a significant main effect for time (Wilk's Lambda=.995, $F(1, 27) = .144$, $Sig=.707$, Partial eta squared=.005). This shows that neither groups' attitudes toward CALL significantly improved over time.

TABLE 7.
RESULTS OF MIXED BETWEEN-WITHIN SUBJECTS ANOVA FOR CALL ATTITUDE QUESTIONNAIRE PRETEST AND POSTTEST

Multivariate tests (of within-subject effect)	Effect	Wilk's Lambda value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
	Time	.995	.144	1	27.0	.707	.005
	Time*Group	.997	.074	1	27.0	.787	.003
Tests of between-subject effect	Group	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
		.075	1(27)	.075	.071	.791	.003

A comparison between the two groups' attitudes toward CALL over time is graphically depicted in Fig.2. As it is shown in the figure below, the students in the DECF group developed stronger positive attitudes than their counterparts in the MECF group over time; however, the results displayed in Table 7 showed no statistical difference between the two groups in terms of CALL attitude.

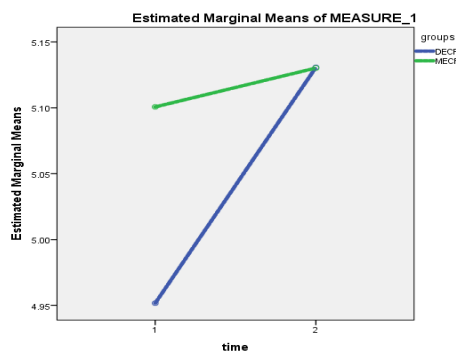


Figure 2. Comparison of pretest (1) and posttest (2) CALL attitude of the DECF and MECF groups

D. Analysis of the DECF and MECF Groups' Opinions about E-feedback

As was mentioned before, to elicit further information about the students' experience of the treatments they received and the effectiveness of E-feedback offered in each group, semi-structured interviews were done with 12 students. The interviews were transcribed and the key concepts were extracted. The students' opinions are categorized based on the interview questions and their themes below.

1. Use of Electronic Resources

All the students who were interviewed stated that they preferred electronic and online language learning materials over traditional ones since these kinds of materials motivate the students and engage them in language learning. For instance, one of the participants emphasized the merits of these assets by stating "since we live in a modern world where we do most of our activities using computers and cell phones, we feel more confident when we use electronic and online language learning resources than paper and pencil ones". Moreover, all the interviewees believed that such materials provide a stress-free environment for language learning. They asserted that if they could have access to softwares designed for language learning, they could refer to them anytime they liked and they did not have to be limited to specific time (such as class hours) and typical classroom settings for language learning. It can be inferred that electronic resources offer flexibility to students since they can use them whenever and wherever they have access to computers and the internet. Moreover, it could be concluded that electronic resources provide equal opportunities for all students.

2. Electronic vs. Teacher Feedback

Most (8 out of 12) of the students participating in the interviews preferred electronic feedback. They declared that they did not like to be corrected by their teacher since they sometimes made silly mistakes which led to their embarrassment. Furthermore, the interviewees believed that using electronic feedback generated a less intimidating environment for language learning. In their opinion, electronic feedback fostered a student-centered environment in which students themselves were responsible for their own learning as well as their strengths and weaknesses in language skills. Nonetheless, although the students considered E-feedback more convenient and less intimidating, some of them preferred it to be supplementary to teacher's feedback. "I'd like to receive both teacher and electronic feedback; in this way I have faith in the correction and I can revise my text with no doubt about the validity of the feedback that I have received," said one of the students.

3. Problems Associated with E-feedback

The participants reported some difficulties with regard to using electronic online materials. They maintained that access to the internet is an important issue to be considered when evaluating advantages of electronic online materials. They said that for those who do not have (permanent) access to the internet, online resources are not effective. One of the students stated "I sometimes had problem benefitting from online materials, in general, and the E-feedback, in particular, since I live in the dormitory where I do not have constant access to the internet". The students also stated that those who do not have basic computer knowledge may not be successful in using online and electronic resources. In addition, although the students regarded computers as user-friendly devices, they believed that computers are not reliable because they may breakdown at any time. Finally, the students cautioned that in some cases the students may encounter problems in language learning which can be resolved merely in the traditional face-to-face learning environment.

IV. DISCUSSION AND CONCLUSION

According to the results of data analyses, the participants' writing accuracy in both groups improved after receiving either type of feedback. The data showed that students who received MECF gained higher scores on accuracy than the group who received DECF; however, there was no significant difference in the effectiveness of the types of feedback that the students received. This finding is in contrast to the studies which showed that either direct or metalinguistic feedback was more effective (Bitchener & Knoch, 2010; Ellis, 2009; Ferris & Roberts, 2001; Sheen, 2007). An explanation for the obtained results can be the fact that both groups, irrespective of the type of feedback, similarly

received systematic corrective feedback; thus, both groups rather equally improved in writing accuracy. Another possible explanation would be that the results may have been affected by the initial greater heterogeneity of the DECF students' writing ability as indicated by the standard deviation of the scores in the pretest of the writing ability. Indeed, as the results of the writing pretest showed, compared to the scores of the MECF group ($SD=3.16$), there was greater dispersion in the writing scores of the students in the DECF group ($SD=1.74$) which shows that the students in the DECF group were not as homogeneous as the ones in the MECF group in terms of writing ability before the inception of the treatments.

Nevertheless, the results are in agreement with the studies which indicated that written corrective feedback improved writing accuracy (Lalande, 1982; Li & Lin, 2007; Sheen, Wright, & Moldawa, 2009; Sheppard, 1992) and are in contrast to some early researches which revealed that corrective feedback given on the students' writing had no or negative effect on their development (Cohen & Robbins, 1976; Hillocks, 1982; Robb, Ross & Shortseed, 1986; Truscott, 1996, 1999, 2009). The researchers who found feedback ineffective admitted that the correction they provided was not systematic enough to influence the accuracy of the students' writing (Cohen & Robbins, 1976; Fazio, 2001). Hence, it may be claimed that the feedback in this study improved the participants' accuracy because the feedback was provided systematically. Moreover, all the students participating in the present study were supposed to revise their first drafts regardless of the type of treatment they received. In fact, revision is regarded as an important activity that helps students to improve accuracy of their writings and develop correctness of their subsequent texts (Li & Lin, 2007).

The effect of metalinguistic and direct electronic feedback on the learners' writing accuracy components was also detected. The results revealed that the participants in the MECF group gained higher structure and punctuation mean gain scores than the ones in DECF group; however, the differences were not statistically significant. Notwithstanding, the analyses showed a statistically significant difference between the DECF and MECF groups in terms of vocabulary gain score. In fact, the students in the MECF group obtained a higher vocabulary gain score. An explanation for this result can be the fact that the students in the MECF group themselves tried to find appropriate substitutes when they received feedback on their choices of words and expressions and this raised their consciousness about their choices and using appropriate words and expressions. On the other hand, the students in the DECF group were provided with appropriate words and expressions by the software when they made mistakes. Moreover, it is also possible that the students in the MECF group had better vocabulary knowledge than the students in the DECF group before the treatment; indeed, before the inception of the treatment, the two groups' language proficiency and overall writing ability, not their vocabulary knowledge, were compared and appeared to be similar.

The participants' attitudes toward CALL in writing were also explored quantitatively before and after the treatments; however, qualitative investigation of their opinions about E-feedback was conducted just after the treatments were over when they had already experienced the use of softwares and received electronic feedback. According to the results, the participants of the present study had nearly positive attitudes toward CALL even before the inception of the treatments. Although they developed stronger positive attitudes after the treatments, there was not a statistically significant difference between their attitudes toward CALL before and after the treatments. Similarly, there was not a significant difference between the two types of feedback in terms of fostering positive attitudes toward CALL among the students. One justification for these findings can be the fact that, as mentioned above, the participants held positive attitudes toward CALL from the beginning of the research and this fact may have motivated them to be involved in the activities and to benefit from the two types of E-feedback to improve their writing accuracy; thus, in a rather similar fashion, the two groups' attitudes did not change considerably as a result of receiving either type of electronic feedback. Furthermore, it can be stated that, overall, the students' attitudes did not improve significantly due to the problems some of them faced while using computers to receive and apply the E-feedback. Moreover, as it was revealed in the interviews, some of them had already used computers for writing and self-correction and this was not their first experience of using computers.

These findings are in line with the literature which shows that students' positive attitudes toward CALL promote their interest in using computers for language learning (Greenfield, 2003; Kelm, 1998; Lasagabaster & Sierra, 2003; Liaw, Huang, & Chen, 2007; Mokhtari, 2013; Rahimi & Hosseini, 2011; Smith, 2000; Stevens, 1991; Warschauer, 1996). Learners' attitude toward computers is a crucial factor that impacts the human-computer interaction. As Rahimi and Hosseini (2011) declare, "There is evidence in the literature that individuals' positive attitudes toward computer-based instruction influence their willingness to sustain using computers for learning" (p. 183).

Apart from the quantitative analysis of the data, the participants' opinions were addressed and qualitatively analyzed. The students who were interviewed believed that electronic materials engage them in language learning and create a stress-free environment for learning. They welcomed electronic sources since they were time and place-independent resources which they can use anytime and anywhere they have access to computers and the internet. Moreover, they stated that the use of electronic sources reduces students' dependence on teachers and that the students become more responsible for their own learning. The students' positive attitudes toward CALL are in line with the literature (e.g., Daly, 2003; Ismail, Almekhlafi & Al-Mekhlafy, 2010; Kim, 2002; Lee, 2000; Riasati, Allahyar, & Tan, 2012). However, the fact that they believed there are some barriers such as lack of time, basic computer knowledge, students and teachers' training courses in implementing CALL in language classes, and the internet accessibility as well as financial barriers also further supports the findings of earlier research (e.g., Han, 2008; Kim, 2002; Lee, 2000; Riasati,

Allahyar, & Tan, 2012).

Therefore, based on the results of the present study, it is recommended that EFL teachers seek effective ways to provide students with (electronic) feedback on their writing tasks in order to improve their writing skill. Teachers are supposed to choose and incorporate appropriate approaches and tools in order to help language learners produce accurate language. In fact, teachers, material developers, and, particularly, educational authorities should become familiar with the benefits of CALL, attempt to reduce barriers of CALL implementation, and integrate it into the writing courses in order to create an environment which positively affects the learning process.

Nonetheless, the findings should be treated with caution because the present study suffered from a number of shortcomings. Due to ethical and practical issues, both groups similarly received electronic corrective feedback and the study lacked a control group. Furthermore, the small sample size needs consideration: there were only 11 and 18 students participating in the DECF and MECF groups, respectively. The next restriction deals with the internet and computer access: some students in both DECF and MECF groups who lived in the dormitory did not have easy access to the internet which may have adversely affected the results. Moreover, due to practical restrictions including financial ones, the researchers had to use the mentioned softwares which were accessible to them in order to provide corrective feedback. Therefore, it is recommended that further research compensating for the above shortcomings should be done in order to verify generalizability of the findings obtained in the present study. Future studies may, among others, take the following suggestions into account: including larger samples as well as control groups in different contexts with better technological facilities and employing other softwares providing more comprehensive electronic corrective feedback.

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