



Handwritten vs. Digital feedback: Which Is the Most Effective in Improving the Writing Accuracy of Kuwaiti Undergraduate University Students?

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Abstract

The current experimental study attempted to investigate which medium of providing indirect corrective feedback, digital /traditional handwritten feedback, could help Kuwaiti undergraduate university students improve their writing accuracy. Moreover, it attempted to examine Kuwaiti undergraduate students' preferences regarding the aforementioned mediums of providing written corrective feedback. To reach this end, an amalgamation of qualitative and quantitative methods was utilized. The subjects of the present study were 75 Kuwaiti undergraduate students who were randomly divided into three groups, two experimental and one control group. While the control group received no feedback, each of the experimental groups received indirect comprehensive corrective feedback via different mediums. The first experimental group received indirect digital written comprehensive feedback via Google Classroom. On the other hand, the second experimental group was provided with indirect handwritten comprehensive feedback. In addition to completing an online survey, all the participants had to generate five writing tasks in twelve weeks. Error ratio was used to measure the short and long term accuracy gains. SPSS program was utilized to analyze the data. The findings of the current study showed that providing written comprehensive feedback digitally has a significant impact on improving the grammatical and the non-grammatical accuracy of the participants during the revision tasks. Regarding the short term effects, while providing digital corrective feedback was found effective in improving the grammatical accuracy gains, providing traditional handwritten feedback was found to have a significant importance in improving the non-grammatical accuracy gains of the understudies of the current study. Concerning the long-term effects, providing corrective feedback digitally was found to have a long term effect on the grammatical accuracy gains of the participants. Conversely, neither of the utilized mediums in providing corrective feedback had any long-term impact on the non-grammatical accuracy gains of the subjects of the current study. More importantly, the participants of the current study reported that the digital medium of providing feedback is more effective in enhancing their grammatical and non-grammatical accuracy gains than the traditional medium.

Keywords: digital, handwritten, comprehensive feedback

INTRODUCTION

Corrective feedback CF is an important instructional strategy for reinforcing English language teaching and learning through supplying L2 learners with feedback so as to rectify their errors. It might provide L2 learners with implicit or explicit feedback which can be beneficial to writing development. According to Elashri (2013), feedback can have three advantages. First, feedback could be a useful tool through which learners can be informed about their good or bad performance. Second, in case of weak performance, additional feedback helps learners to take corrective actions about their writing to improve their performance to a satisfactory level. Third, feedback can not only assist learners to keep a track of their development, but it can also prompt learners to adopt another's remark and adjust a message to it.

While the extensive use of traditional corrective feedback in EFL classrooms has been a topic for hot debates, the introduction of computer-mediated corrective feedback has attracted considerable concern recently. Nonetheless, the number of studies that have been carried out to examine the different impacts of both traditional and computer-assisted feedback on the writing accuracy of under graduate students is limited. Thus, the main target of the present research is to examine the impact of both types of feedback and to identify which type is the most beneficial in enhancing the writing accuracy of the undergraduate students.

REVIEW OF THE LITERATURE

In this section, a definition of feedback is given, different types of feedback is presented and finally previous research in both medium of delivering feedback (traditional corrective feedback and computer mediated corrective feedback) are provided.

Definition of Feedback

All feedback could be virtually described as formative, since it is meant to be non-evaluative, directive and facilitative to the learning process. It is necessary here to explicate precisely the definition of formative feedback. Shute (2008, p. 153) defined formative feedback as "information communicated to the learner that is intended to modify his or her thinking or behavior to improve learning." In addition, she demonstrated that formative feedback can be viewed as supportive to the learners, not intended to evaluate their performance, presented at the right time and precise.

Types of Feedback

There are several subdivisions of formative feedback. Amongst these subdivisions are corrective and non-corrective formative feedback. Non-corrective formative feedback occurs when a teacher praises, encourages and supports a student, additionally, it is broad and does not supply the learner with instruction about how to correct erroneous forms. In contrast, formative corrective feedback is directive and informative to the learners about their errors. Sheen & Ellis (2011, p.593) defined formative corrective feedback as "the feedback that learners receive on the linguistic errors they make in their oral or written production in a second language (L2)." This definition implies two

subdivisions; oral feedback which involves on-line and off-line efforts to make L2 learners informed of producing erroneous utterance and written corrective feedback which involves delayed or off-line corrections of L2 learners' errors in a written text.

A distinction should be made between implicit and explicit type of feedback. These two types are categorized under oral feedback. Oral corrective feedback is implicit when the teacher attempts to covertly notify the learner of the inadequacy of his incorrect utterance. Oral corrective feedback can also be explicit when the teacher overtly highlights the learner's erroneous utterance or gives metalinguistic description of the error. By contrast, written corrective feedback is [definitely](#) explicit; the learner recognizes that he has been rectified (Sheen & Ellis, 2011).

Written corrective feedback

Written corrective feedback can be delivered in various ways. We will focus on two major types that are related to the present study. Written corrective feedback can be regarded from the perspective of directness as direct written corrective feedback and indirect written corrective feedback.

1-Direct written corrective feedback

Bitchener & Ferris (2012) refer to direct written feedback as the process that provides explicit rectification of linguistic form adjacent to the linguistic error. They state that this process involves the deleting of an excessive word or phrase, the addition of a missing word or a phrase and providing the L2 learner with accurate linguistic form (input-providing feedback). According to Bitchener and Knoch (2010) direct corrective feedback is more beneficial to L2 learners due to its explicit capacity to enable L2 writers to recognize their errors and the correct forms which decreases L2 writers' confusion over teacher's feedback. Hence, this kind of feedback can be more relevant to low proficiency L2 writers who are not capable of self-correcting their errors irrespective of the fact that these errors are evident to them (Ferris & Hedgcock, 2005; Ellis, 2009).

2- Indirect written corrective feedback

Bitchener & Ferris (2012) define indirect corrective feedback as the process of indicating the linguistic error without giving the accurate linguistic form or explicit meta-linguistic information (output-prompting feedback). This type of feedback can be given either by highlighting the linguistic error or by reporting in the margin the number of errors in a specified line. The L2 writers are supplied with a code to show the type of error and possess the ability to work out and correct the linguistic error that is drawn to their attention. In this type of feedback, L2 writers are stimulated cognitively to correct their errors depending on their previous knowledge. Therefore, indirect feedback raises L2 writers' involvement and attentiveness to forms and enhances their ability to solve problems which numerous researchers confirm that it is helpful for developing long term acquisition. Both direct and indirect written corrective feedback may or may not occur with metalinguistic information.

Sheen & Ellis (2011, p.594) provided a useful taxonomy of direct and indirect written corrective feedback strategies in the following table:

A Taxonomy of Written CF Strategies

	Direct	Indirect
Metalinguistic information	• Provision of the correct form with brief grammatical explanation.	• Use of error code (e.g., symbols such as VT to signal a verb tense error or WO a word order error are inserted into the text). • Use of brief grammatical explanation (e.g., error types are numbered in the text and then a brief explanation of each type of error is provided at the end of the text).
No metalinguistic information	• Provision of the correct form only. • Reformation of the entire sentence or paragraph.	• Errors are indicated but not located and the correct form is not supplied (e.g., a cross is placed in the margin next to the line where an error has occurred). • Errors are indicated and located but the correct form is not supplied (e.g., an error is underlined in the place in the text in which it occurs).

As previously mentioned, indirect corrective feedback is utilized in the current research for its potential for engaging learners in assisted learning and problem-solving (Lalande, 1982). This type of feedback promotes reflection about linguistic forms of prior knowledge or partly internalized knowledge which can presumably boost the accuracy of writing and long term acquisition (Ferris and Roberts, 2001; James, 1998; Reid, 1998).

Previous research on written corrective feedback

In late 1990s, a large amount of research has revolved around the effectiveness of written corrective feedback in helping improve learners' linguistic accuracy. On the one hand, some L2 writing researchers argue that written corrective feedback has no impact on L2 writing accuracy (Robb, Ross, & Shortreed, 1986; Kepner, 1991; Truscott, 1996; Truscott, 1999; Truscott, 2007). On the other hand, other researchers confirmed that written corrective feedback has a beneficial influence on the progress of L2 learners writing accuracy (Ferris, 1999; Ashwell, 2000; Ferris, 2004; Bitchener et al., 2005; Bitchener, 2008). This argument between Truscott (1996) and Ferris (1999) generated an immense number of studies exploring the impacts of written corrective feedback on L2 learners' writing accuracy and grammatical correction.

In their seminal meta-analysis, Russell & Spada (2006) argue that various factors which might have an influence on the efficacy of corrective feedback for L2 grammar learning have been investigated. These factors include the type of feedback (implicit or explicit), the mode of feedback (oral or written), the amount of feedback, the source of feedback and the focus of feedback (focused or unfocused). They reported on a meta-analysis of 56 studies that explored the impacts of corrective feedback on L2 grammar learning. Their meta-analysis provides support for the efficiency of corrective feedback for L2 grammar learning and suggests durable benefits for corrective feedback on L2 acquisition.

With reference to exploring the efficacy of focused vs. unfocused written corrective feedback, Russell & Spada (2006) reported that no differences were found between general and specific focus of corrective feedback. In addition, they admitted the number of studies included in the analysis is not enough to reach firm conclusions, confirming the need for further research to explore the impact of specific and general focus of errors in feedback. Despite this, various researchers have pinpointed that focused corrective feedback was more useful than unfocused CF (Bitchener, 2008; Ellis et al., 2008; Sheen, 2007). However, results from these studies cannot be generalized (Hyland & Hyland, 2006). Conversely, Van Beuningen et al. (2012) found that unfocused CF is beneficial and does aid L2 learners develop their writing competency level in the revised text and further work.

Li (2010) conducted a meta-analysis of 33 studies on the efficacy of corrective feedback in SLA. He indicated that an average overall impact for corrective feedback existed and this impact is retained over time. Furthermore, he revealed that explicit feedback performed more effectively than implicit feedback on instant and short-delayed posttests. However, implicit feedback worked more effectively on long-delayed posttests. From this, he concluded that implicit feedback had a long-term impact which was bigger than its short-term impact and that explicit feedback possessed short term effect. He suggested that implicit feedback could be more useful to the improvement of L2 competence.

Regarding indirect and direct corrective feedback efficacy in developing writing proficiency, research shows unclear results. By way of illustration, Van Beuningen et al. (2012) indicate that indirect and direct corrective feedback is beneficial to L2 learners' proficiency, however differences in improvements are clearly seen in the two methods. According to them, both indirect and direct CF proves to be useful for L2 learners' writing in global and non-grammatical accuracy. Nevertheless, regarding grammatical accuracy, their research indicates that merely direct corrective feedback can have a useful impact on L2 learners' proficiency level. With regard to overall accuracy and non-grammatical accuracy, indirect CF was established to be most efficient. These results clearly show that both indirect and direct corrective feedback is beneficial, yet they address distinct problem areas since different errors need different modes of feedback.

With respect to context of learning, Li (2010) argue that research conducted in foreign language context generated greater effect sizes than studies in second language settings. He concluded that corrective feedback has larger effect in foreign language environment than in second language environment. He elaborated that the instructional dynamics of foreign language context could explain such effectiveness on corrective feedback. He suggested that EFL learners might have more corroborative approach towards error rectification than ESL learners. However, Kang & Han (2015) argue in their analysis that L2 learners are likely to profit from specifically written feedback more than learners in a foreign language context. They elaborate that Li (2010) focused mainly on oral corrective feedback and his conclusions about the efficacy of corrective feedback in a foreign language setting can be applied to oral corrective feedback and cannot be extrapolated to written corrective feedback. They explain that written corrective feedback is more

explicit than oral corrective feedback and thus can be observed by learners with or without metalinguistic awareness. In addition, they presented additional explanation that Ferris (1999, 2000) has noticed that foreign language classrooms are likely to be less involved in the writing process and have limited access to writing in target language within their classrooms, therefore EFL learners are less motivated to revise and rectify their own writing.

Computer-mediated corrective feedback

According to Rezaee & Ahmadzadeh (2012) computers have become an indivisible component of everybody's life, particularly in the discipline of education and language learning and teaching. They confirmed that the expanding role of computers and technology have made them indispensable part of language instruction and its curriculum. In addition, digital feedback is mainly reported to have beneficial effects on learner perceptions and development and are commonly considered to be more engaging (Dawson et al., 2018). Loewen & Erlam (2006) confirmed that the efficiency of computer mediated corrective feedback on improving communication is encouraging, proposing it can be better than face to face communication in a language classroom regarding the chances it provides for L2 learners interaction (synchronous and asynchronous communication).

Many studies (Tuzi, 2001, 2004), which examined the impact of computer mediated feedback on L2 learners writing accuracy, have proven the beneficial impact of this sort of feedback on L2 writers' performance. More specifically, a number of studies (Razagifard.P & Razzaghifard , 2011 ; Hosseini , 2013 ; AbuSeileek&Abualsha'r,2014 ; Al-Olimat & AbuSeileek, 2015 ; Farshi& Safa ,2015) have inspected the influence of computer mediated corrective feedback in an EFL context. These studies revealed a significant influence of the computer mediated feedback on EFL students' writing accuracy.

Computer-mediated corrective feedback vs traditional feedback

A few studies have been conducted comparing computer mediated corrective feedback and traditional written corrective feedback. For example, Liu and Sadler (2003) investigated if differences in both methods of commenting (Microsoft Word) and communication using Multi-user domains Object-oriented (MOO) were more efficient than traditional writing instruction. The results indicate that the total number of comments, the average of revision comments and hence the total number of revisions generated by the digital group were greater than those generated by the traditional group.

Yeha and Lo (2009) conducted a comparative study on computer mediated corrective feedback as contrasted with handwritten corrective feedback on EFL learners' error correction. The study created an online error rectification and corrective feedback method. The findings reveal that corrective feedback delivered via computer developed L2 learners' metalinguistic awareness and helped L2 learners recognize their writing errors.

In a study conducted by Fashi & Safa (2015), they compared the impact of traditional corrective feedback and digital corrective feedback using e-mails on 35 advanced EFL learners classified into two experimental groups and one control group who did not receive neither hand written nor electronic feedback. Results revealed that both traditional and electronic feedback is effective. However, the electronic feedback group significantly surpassed the group who received hand written feedback as shown by the scores of both groups. The study concluded that electronic corrective feedback can promote writing accuracy more than traditional feedback.

Most recently Hadiyanto (2019) explored whether computer mediated corrective feedback group of L2 writers have better performance handwritten feedback group of L2 writers. The results indicate that the group who was given computer mediated feedback had better scores in the expository writing test than the group who received traditional feedback. He argued that computer mediated feedback had a positive impact on both the L2 writers and teachers who kept on practicing and applying the new feedback (computer mediated feedback). He recommended using computer mediated feedback for teaching writing nowadays because of its capacity in improving L2 writing accuracy in particular intermediate and university students.

According to AbuSeileek & Abualsha'r (2014), the number of computer mediated studies investigating the efficacy of corrective feedback types was insufficient to explain the benefits of this medium in comparison with the traditional corrective feedback and more studies tackling this issue must be conducted.

Since few studies have been conducted in this field, especially, in EFL context, there is still a gap in the literature about the effects (revision, and short/long term) of computer mediated corrective feedback in comparison to traditional feedback on the writing accuracy of the learners. More importantly, it was also noted that the existing body of literature includes a limited number of studies that endeavor

ed to explore the participants' preferences regarding the efficiency of the two different mediums, digital, and traditional, in providing feedback. To this end, the current study sets out to examine the impact of computer mediated corrective feedback and its superiority over traditional written corrective feedback. Furthermore, it endeavors to investigate the students' preferences and perceptions about the best medium to be utilized to provide corrective feedback. Based on the above review of literature, the present study aims to answer the upcoming research questions:

- What are the effects of providing indirect comprehensive computer assisted feedback via Google Classroom versus traditional indirect comprehensive corrective feedback on the writing accuracy of Kuwait undergraduate students?
- What are Kuwaiti undergraduate students' preferences regarding which medium (digital /traditional) they think is the most effective in providing feedback?

METHODOLOGY

Participants

The participants of the current study were 75 Kuwaiti undergraduate university students who were matriculated in the Arab Open University, Kuwait Branch as Full-time students. 56 % of the participants of the current study were male and 44 % were female who varied in age. However, most of the subjects of the current study were between 20 to 30 years old. The participants of the current study come from different educational backgrounds. Most of them were high school graduate, others were graduate from vocational education, and some of them were university graduate. Despite the fact that they varied in their level of education, their English proficiency levels were homogenous as all of them were intermediate students. Table1 illustrates the participants' levels of education.

Table 1: Participants' levels of Education

Level of Education	Number of the participants	Percentage
High School	46	61%
Vocational Education	14	19%
University/ College level	15	20%
Total Number	75	100%

To ensure that all the participants of the current study had nearly the same level of proficiency, all the participants of the current study had to generate a 150-200-word paragraph as a writing proficiency test. First, the writing task was corrected by the researcher of the current study. After one week, a different instructor corrected the same writing task. Finally, the grammatical and non-grammatical errors ratios of the participants' writing tasks were analyzed. An inter-rater test was used to corroborate the results. The analysis of the grammatical and non-grammatical errors ratios of the participants' writing tasks did not vary significantly which indicated that the participants had nearly the same level of proficiency.

Treatment groups

The participants of the current study were divided into three groups. Two groups were experimental and the third was a control group. Each of the experimental group was afforded a different treatment. The first treatment group consisted of 26 participants who received digital written comprehensive indirect feedback via Google Classroom, where all the errors that occurred in their writing tasks were highlighted and some metalinguistic comments to highlight the nature of these errors were provided. Since the participants of this group practiced their writing digitally on Google forms, they received the treatment digitally via Google Classroom. The second treatment group comprised 27 participants who received traditional written comprehensive indirect corrective feedback. All the errors that occurred in the writing tasks of the participants were highlighted and some metalinguistic comments to highlight the nature of these errors were provided. As the participants of this group practiced writing on paper, they received a traditional hand-written corrective feedback. Finally, 22 participants formed the

control group who practiced paper-based writing and did not receive any type of feedback except some comments on the content and the organization of their writing tasks.

Writing tasks

All the participants of the current study were required to generate 5 different writing tasks. 4 of these writing tasks were generated in 4 subsequent weeks while the last writing task was generated in the twelfth week, 8 weeks after the last treatment session. Each writing task included a prompt and some guiding details or questions to guide the participants to fulfil the requested tasks. The following, Table 2 presents a full description of the writing tasks that were used in the current study.

Table 2. Writing Tasks

	Topic	Guiding Details	Number of words
Week 1	Summer Holiday	Describe the importance of holiday. How you spent your summer holiday.	150-200
Week 2	Best friend	The qualities of good friends and how these qualities affect your choices? Why is it important to have a friend?	150-200
Week 3	An important event	Why did you choose this event? How this event influenced your life.	150-200
Week 4	A place you have visited and will never forget.	Why did you select this place? Describe the place. Why it had influenced you.	150-200
Week 12	The most influential person in your life.	Why you selected this person. How did this person affect your life? Why is this person important in your life?	150-200

Treatment

After receiving the participants' writing tasks, the researcher provided each group the respective treatment. After two days, all writing tasks were returned to the participants. All the participants were requested to go through the provided treatment in 30 minutes, and were allowed another 30 minutes to generate another draft for the same writing task. Accordingly, the treatment procedures were conducted all through 12 weeks. During the first week, writing task one and revision one were completed. In the second week, both the second writing task along with its revision were completed. Likewise, during the third week, writing task three along with revision three were accomplished. Additionally, in week four, writing task four and its revision were completed. Finally, on the twelfth week, writing task five was accomplished. Concerning the first group, the researcher had to copy their writing to Google Docs to be able to correct the writing digitally. On the revision day, the researcher shared their writing tasks with the provided feedback. Regarding the control group and despite the fact that they were not provided with any type of feedback, they had to count on themselves on editing their writing and generating a new draft for each writing task.

Questionnaires

The researcher had to design two online questionnaires on google forms. One of the questionnaires was designed to be utilized with the experimental groups while the other one was devised to be utilized by the participants of the control group. The designed questionnaires were meant to enable the researcher to collect data from the participants of the current study to help him answer the second research question which is pertinent to the participants' preferences regarding which of the used mediums to provide corrective feedback they think was the most effective in helping them improve their writing accuracy. The experimental group questionnaire consisted of 8 questions. In addition to four demographic questions, the questionnaire involved 4 other questions which aimed at identifying the participants' preferences and beliefs regarding the most effective medium of the providing corrective feedback.

Unlike the first questionnaire, the second questionnaire involved a total of 9 questions. 4 out of these 9 questions were demographic questions, and the other 5 questions were devised specially to investigate the perceptions and beliefs of the participants of the control group regarding editing their own writing and which medium of providing feedback they prefer. Before conducting the questionnaires, the researcher presented the different mediums used in providing corrective feedback to familiarize all the participants with the utilized mediums to provide corrective feedback. To reach this end, a four-slide PPT was utilized to demonstrate brief information about each medium. He also spent some time explaining the questionnaires to the participants. Additionally, the participants were allowed to inquire about any ambiguous details relevant to the questionnaires. All the participants were not allowed to exchange answers or talk to each others so as not to affect on each other's beliefs.

Data analysis

First, the researcher had to categorize the errors that appeared on the writing tasks of the participants into grammatical and non-grammatical errors. To measure the effectiveness of the two different methods of providing feedback (digital feedback/traditional hand written feedback), the researcher of the current study utilized error ratios. In this method, the number of the errors that occurred in a writing task was divided by the number of words of the same writing task and the outcome was multiplied by one-hundred. After calculating grammatical and non-grammatical error ratio for each writing task and its subsequent revision, long and short term accuracy gains were measured. To measure the short term effects, the grammatical and non-grammatical error ratio of one writing task was compared to the grammatical and non-grammatical error ratio of the previous writing task. In order to be able to measure the long term effects of using the different methods, the grammatical and non-grammatical error ratio of writing task 5 which was conducted on week 12, after eight weeks from the last treatment received in week four was compared to the grammatical and non-grammatical error ratio of writing task 4. All the collected data was recorded in a spreadsheet then they were all imported to SPSS program to be analyzed. One-way ANOVA test was used to compare the mean values of the groups' grammatical and non-grammatical accuracy

gains. In this fashion, positive values indicated a decrease of the number of errors and that indicated improvement in the proficiency levels of the participants and vice-versa.

Concerning the qualitative data, all the responses collected from the participants of the current study were transferred into a spreadsheet. Common themes amongst the participants were highlighted. The color coding technique was utilized to highlight the commonalities that occurred in their responses.

FINDINGS

With reference to the first research question, which medium of providing written corrective feedback is the most effective in helping the learners improve their writing accuracy, the findings of the analysis of the quantitative data showed that both experimental groups, group I that received digital corrective feedback and group II that received traditional hand written corrective feedback reduced more grammatical and non-grammatical errors than the control group during the revision tasks. Table 3 presents ANOVA test results.

Table 3. One-way ANOVA test results for grammatical accuracy During revision tasks

Gr_R5	Indirect/ Digital (n = 26) (Mean $\pm$ SD)	Indirect/ Traditional (n = 27) (Mean $\pm$ SD)	Control Group (n = 22) (Mean $\pm$ SD)	P
Gram_R1	4.01 $\pm$ 2.94	2.44 $\pm$ 0.3	-0.02 $\pm$ 1.27	<0.002*
Gram_R2	7.47 $\pm$ 4.99	3.02 $\pm$ 3.25	2.12 $\pm$ 1.26	<0.001*
Gram_R3	5.36 $\pm$ 3.87	2.4 $\pm$ 2.1	0.55 $\pm$ 0.1	<0.003*
Gram_R4	6.51 $\pm$ 3.61	2.13 $\pm$ 1.82	0.45 $\pm$ 0.1	<0.005*

According to the data illustrated in Table 3, it is obvious that the group that received indirect corrective feedback via Google Classroom has significantly improved their grammatical accuracy gains during the revision tasks. In addition, it was also found that the members of the group that received indirect feedback via Google Classroom outperformed both the participants of the control and traditional feedback groups. Regarding the reduction of the grammatical errors during the revision tasks, there has been a remarkable significant reduction from Writing 1 to Revision 1, Writing 2 to Revision 2, Writing 3 to Revision 3, and Writing 4 to Revision 4.

In addition to the highlighted significance of the revision tasks on enhancing the grammatical accuracy of the participants of the treatment group, the findings of the analysis of the qualitative data has also demonstrated that the participants of the experimental groups were able to correct more non-grammatical errors than the

participants of the control group could. Table 2 presents the results of the ANOVA test results.

Table 4. One-way ANOVA test results for non-grammatical accuracy During revision tasks

Non-gr	Indirect/ Digital (n = 26) (Mean ± SD)	Indirect/ Traditional (n = 27) (Mean ± SD)	Control Group (n = 22) (Mean ± SD)	P
Non-gr_R1	14.21 ± 5.94	10.44 ± 3.3	0.02 ± 1.27	<0.005*
Non-gr_R2	6.02 ± 3.03	3.02 ± 2.25	1.2 ± 1.26	<0.004*
Non-gr_R3	5.28 ± 2.1	2.8 ± 1.1	0.58 ± 0.1	<0.001*
Non-gr_R4	3.41 ± 1.21	1.13 ± .02	0.35 ± 0.1	<0.000*

As illustrated in Table 4, the members of the groups that received treatment, digitally and traditionally, were more capable of improving their non-grammatical accuracy gains during the revision tasks. Moreover, it is evident that the group that received indirect corrective feedback digitally achieved more non-grammatical accuracy gains than the other two groups, the indirect traditional written and the control group. Additionally, during the four revision tasks, a significant difference in the reduction of the non-grammatical errors has been highlighted amongst the three groups.

Regarding the short term effects of the provided treatment on both the grammatical and the non-grammatical accuracy gains, from one writing task to another writing task, it was found that the treatment groups were able to reduce more grammatical and non-grammatical errors than the control group. Regarding the short term impact of the provided treatment on the grammatical accuracy gains, the analysis of the quantitative data showed that the group that received digital indirect corrective feedback outperformed the group that received traditional indirect written corrective feedback in improving their grammatical accuracy from Wr1 to Wr2, Wr2 to Wr3, and Wr3 to Wr4. However, the three groups varied significantly in their grammatical accuracy improvement only on W3, and W4. With reference to the short term effect of the afforded treatment on the non-grammatical accuracy gains, it was found that the group that received traditional indirect written corrective feedback improved their non-grammatical accuracy than the group that received digital indirect feedback from Wr1 to Wr2, Wr2 to Wr3, and Wr3 to Wr4. Nonetheless, the three groups' non-grammatical accuracy gains varied significantly only during W2, W4.

In addition to investigating the short term impact, the long term impact, from Wr4 to Wr5, of the provided feedback on the grammatical and the non-grammatical accuracy gains of the participants of the current study was investigated. According to the results of the analysis of the quantitative data, the two treatment groups were able to reduce their

grammatical and non-grammatical errors in Wr5, after 8 weeks from the last treatment session they received in week 4. Regarding the long term impact on the grammatical accuracy gains from Wr4 to Wr5, it was found that the group that received digital indirect corrective feedback could retain a better grammatical accuracy gains than the group that received traditional written indirect corrective feedback and the group that received no feedback. The One-way ANOVA test results showed that the three groups varied significantly in their grammatical accuracy gains in Wr5. Despite the notable long term-impact of the used mediums on the grammatical accuracy gains of the participants of the current study, there was no statistical significant difference between the three groups in the non-grammatical accuracy gains from W4 to W5.

With reference to the second research question that attempted to investigate the participants' preferences regarding the most effective medium to be utilized in providing feedback, an 8-question questionnaire was used. When asked about their preferences regarding whether they wish to receive corrective feedback or not, 95 % of the participants expressed their dire need to receive corrective feedback. On the other hand, only 5% rejected the idea of receiving corrective feedback. Despite their level of proficiency, 86% of the participants of the current study reported their desire to receive direct and comprehensive corrective feedback while only 14% were happy with indirect corrective feedback. Finally, most of the participants of the current study, 78%, expressed their preferences to receive digital feedback, and only 22% of the participants preferred to receive traditional feedback. Figure1 presents the distribution of the participants' preferences.

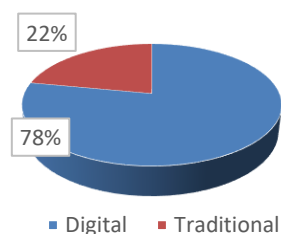


Figure 1. The Participants' Feedback Preferences

Table 5. Quotes of some participants' responses

Participant	Justification
P1	" easy to read."
P2	" teacher words are saved in my account I do not need to worry about my paper"
P3	"I can look at it at anytime"
P4	"I always look at my writings to learn and google classroom had my writings to check the mistakes."
P5	"It is there all the time so I can learn from my mistakes"
P6	"I can't ask the teacher questions but I can text on google to ask"

As shown in Table 5, some of the participants reported their rationale for preferring digital feedback via Google Classroom to traditional written corrective feedback. According to some participants, using Google Classroom to provide feedback is more convenient as the typed feedback is easier to be understood than the hand written. In this sense, students will not suffer to sometimes work out the illegible scribbles provided by the teachers. Other participants referred to the fact that all the written work in addition to the corrections provided by the instructor are saved on a cloud for them to check them at their convenience. Being available 24/7 made Google Classroom the most desired by most of the partakers since they mentioned in their responses that the availability of their writing tasks allow them more time to go back to their work and check their errors and the comments to learn from them. Finally, other participant referred to the fact that such medium could help shy learners to go out of their comfort zone. Since s/he referred to his/ her inability to ask face-to-face questions, the digital medium afforded him/her a chance to ask his/her questions without having to approach the teacher to get the answer. Accordingly, the accessibility, the legibility, and the availability of Google Classroom were major themes mentioned by most of the participants to rationalize their preferences to receive digital corrective feedback.

Conversely, the other 22% of the the participants who preferred to receive traditional handwritten corrective feedback mentioned nearly the same reason for favoring this medium for the reception of corrective feedback. According to them, hand written corrective feedback allows them to discuss the errors with the instructor and that will enhance their understanding of their errors and the provided correction.

DISCUSSION

The current study was conducted as an attempt to investigate the impact of digital and traditional indirect corrective comprehensive feedback on the writing accuracy of Kuwaiti undergraduate university students. In addition, the current study attempted to investigate the preferences of the participants of the current study regarding which medium they believe is the most efficient to be used in the process of corrective feedback provision.

With reference to the first research question, the current study investigated the following various effects for the two mediums:

- The impact of the used mediums to provide treatment on the grammatical and non-grammatical accuracy gains of the participants during the revision tasks.
- The short term effects of the used mediums to provide treatment on the grammatical and non-grammatical accuracy gains of the participants from one writing to a new piece of writing.
- The transfer long-term effects of the used mediums to provide treatment on the grammatical and non-grammatical accuracy gains after 8 weeks from the last treatment session administered on week 4.

With reference to the impact of the used mediums to provide treatment on the grammatical and non-grammatical accuracy gains during the revision tasks, it was found that digital indirect feedback is more efficient than traditional indirect corrective

feedback in helping the participants enhance their grammatical and non-grammatical accuracy gains. That is to say providing feedback via Google Classroom impinged on the students' ability to correct their grammatical and non-grammatical errors positively. Tuzi's (2004) findings are in congruent with the findings of the current study. In his findings, Tuzi (2004) claimed that computer mediated feedback has a positive impact on the writing accuracy of the participants of the current study during the revision tasks. In addition, these findings corroborate the findings of Ene, E., & Upton, T. A. (2014). As both emphasized the significance of utilizing digital feedback in improving the grammatical accuracy of language learners. According to the results of the analysis of the qualitative data, the participants of the group that received digital indirect comprehensive feedback has reported that digital corrective feedback helped them reduce the committed grammatical and non-grammatical errors during the revision tasks. Consequently, 78 % of the participants reported digital corrective feedback as the most desired medium for providing corrective feedback.

In addition, the positive impact of using Google Classroom as a medium in providing feedback was not only evident during the revision tasks, but it was also unequivocal from one writing to a new piece of writing. According to the analysis of the quantitative data, it was demonstrated that the participants of the group that received indirect digital corrective feedback via Google Classroom were able to reduce their grammatical errors from one writing to a new piece of writing. However, the analysis of the quantitative data showed that indirect traditional corrective feedback was more efficient in helping the participants reduce their non-grammatical errors than the group that received digital indirect corrective or the control group do.

With reference to the long-term transfer effects, it was found that providing digital corrective feedback via Google Classroom has long-term effects on the grammatical accuracy gains of the participants after 8 weeks from the last treatment session administered on week 4. However, providing traditional indirect corrective feedback did not have any long-term impact on the grammatical accuracy gains of the participants. Speaking of the long-term impact of providing digital/ traditional indirect corrective feedback on the non-grammatical accuracy gains, no significant difference was found between the accuracy gains of the three groups despite the fact that providing indirect feedback digitally enabled the participants to commit less grammatical errors than the group that received traditional indirect corrective feedback and the control group. Despite being provided digitally, indirect corrective feedback demonstrated long and short term efficiency on grammatical accuracy gains (Ferris and Roberts, 2001; James, 1998; Reid, 1998). Conversely, van Beuningen et al. (2012) claimed that direct corrective feedback is more beneficial in improving the grammatical accuracy of the participants. However, some scholars such as Bitchener & Ferris's (2012), and Westmacott, A. (2017) postulated that indirect corrective feedback is more effective in enhancing the long term acquisition of forms. To conclude, indirect corrective feedback accurately helped the participants to decide on their hypotheses about their generated grammatical errors, successfully correct and internalize them. On the other hand, it failed to help them with

deciding on their hypothesis about their generated ungrammatical errors, and correct them due to the lack of knowledge van Beuningen (2011).

Based on the highlighted evidence, it is apparent that utilizing Google classroom in providing corrective feedback had enabled the students to reduce their grammatical and non-grammatical errors during the revision tasks. Notably, Tuzi (2001) had highlighted the same findings. According to him, computer assisted feedback helped the participants of his study to write a better text. Additionally, Yeha and Lo (2009) averred that not only did computer assisted feedback help the learners recognize their errors, but it also helped them raise their metalinguistic awareness of their errors. On the other hand, some other studies completely disagreed with the findings of the current study. Amongst these studies, Matsumara and Hann (2004) and Sauro (2009). Unlike the current study, Matsumara and Hann (2004) claimed that providing traditional corrective feedback is more efficient in enhancing the students writing accuracy than digital corrective feedback. Likewise, Sauro (2009) found no significant difference between providing computer assisted feedback and traditional corrective feedback.

Unlike the findings of Edeiken-Cooperman. N and C.L. Berenato (2014), the findings of the analysis of the qualitative data highlights the superiority of digital feedback over traditional corrective feedback corroborates the findings of the quantitative data which demonstrated that the majority of the participants prefer digital feedback as the most convenient medium to receive corrective feedback through. These findings line with Chang, N., Watson, B., Bakerson, M.A., Williams, E.E., McGoron, F.X., Spitzer, B. (2012)'s findings regarding the participants' preference. In their study, most of the participants favored digital feedback over the traditional or the hand written feedback. In their responses, the participants of the current study agreed with the participants of various studies such as Chang, N., Watson, B., Bakerson, M.A., Williams, E.E., McGoron, F.X., Spitzer, B. (2012) which were conducted to investigate the participants' preferences regarding the utilized medium to provide the corrective feedback. Despite the fact that the participants of that study and the current study were conducted in different contexts, common themes in the participants' responses were reported in both studies to justify their preferences of digital corrective feedback. Amongst these themes were the accessibility, the legibility, and the availability of digital corrective feedback. Lacking most of the aforementioned characteristics, traditional written corrective did not suffice the requirements of the participants. Thus, it was consequently spurned and denied to be the most effective medium in providing corrective feedback.

In conclusion, the current study aimed at identifying the most effective medium in providing corrective feedback to help language learners improve their writing accuracy. Similar to most of the previous studies such as Razagifard P. and Razagifard (2011), Farashi & Safa (2015), and Hadiyato S. (2019), the findings of the current study highlighted the effectiveness of computer assisted corrective feedback via Google Classroom in helping the participants of the current study to ameliorate their writing accuracy. Since the current study was conducted on a limited number of university students, it is recommended that further studies including a bigger number of participants from different universities in Kuwait to be conducted to provide more

authentic findings that could be generalized. Additionally, it is also recommended to conduct other studies on a different context such as high school students to add to the body of literature of the written corrective feedback. More importantly, conducting similar studies on students with different proficiency levels is highly recommended. Finally, another replica of the current study that will involve more treatment groups that will receive different types of feedback such as direct, indirect, and indirect with meta-linguistic comments will be of a great significance to on-going debate over the efficiency of the provided types of feedback.

REFERENCES

- AbuSeileek, A., & Abualsha'r, A. (2014). Using peer computer-mediated corrective feedback to support EFL learners' writing. *Language Learning & Technology*, 18(1), 76-95.
- Al-Olimat, S. I., & AbuSeileek, A. F. (2015). Using computer-mediated corrective feedback modes in developing students' writing performance. *Teaching English with Technology*, 15(3), 3-30.
- Ashwell, T. (2000). Patterns of teacher response to student writing in a multiple-draft composition classroom: Is content feedback followed by form feedback the best method? *Journal of second language writing*, 9(3), 227-257.
- Asiri, I. M. (1999). University EFL teachers' written feedback on compositions and students' reactions.
- Bitchener, J. (2008). Evidence in support of written corrective feedback. *Journal of second language writing*, 17(2), 102-118.
- Bitchener, J., & Ferris, D. R. (2012). *Written corrective feedback in second language acquisition and writing*. Routledge.
- Bitchener, J., & Knoch, U. (2010). The contribution of written corrective feedback to language development: A ten-month investigation. *Applied Linguistics*, 31, pp.193-214.
- Bitchener, J., Young, S., & Cameron, D. (2005). The effect of different types of corrective feedback on ESL student writing. *Journal of second language writing*, 14(3), 191-205.
- Chang, N., Watson, A. B., Bakerson, M. A., Williams, E. E., McGoron, F. X., & Spitzer, B. (2012). Electronic feedback or handwritten feedback: What do undergraduate students prefer and why?. *Journal of Teaching and Learning with Technology*, 1-23.
- Dawson, P., Henderson, M., Ryan, T., Mahoney, P., Boud, D., Phillips, M., & Molloy, E. (2018). Technology and feedback design. *Learning, Design, and Technology*, Michael J Spector, Barbara B Lockee, and Marcus D. Childress (Eds.). Springer International Publishing, Cham, 1-45.
- Edeiken-Cooperman, N., & Berenato, C. L. (2014). Students' Perceptions of Electronic Feedback as an Alternative to Handwritten Feedback: One University's Inquiry. *Journal of Education and Learning*, 3(1), 79-85.
- Elashri, I. I. E. A. F. (2013). The Impact of the Direct Teacher Feedback Strategy on the EFL Secondary Stage Students' Writing Performance. Online Submission.
- Ellis, R. (2009). Corrective feedback and teacher development. *L2 Journal*, 1(1).
- Ellis, R., Sheen, Y., Murakami, M., & Takashima, H. (2008). The effects of focused and unfocused written corrective feedback in an English as a foreign language context. *System*, 36(3), 353-371.
- Ene, E., & Upton, T. A. (2014). Learner uptake of teacher electronic feedback in ESL composition. *System*, 46, 80-95.

- Farshi, S. S., & Safa, S. K. (2015). The effect of two types of corrective feedback on EFL learners' writing skill. *Advances in Language and Literary Studies*, 6(1), 26-30.
- Ferris, D. (1999). The case for grammar correction in L2 writing classes: A response to Truscott (1996). *Journal of second language writing*, 8(1), 1-11.
- Ferris, D. R. (2004). The "grammar correction" debate in L2 writing: Where are we, and where do we go from here?(and what do we do in the meantime...?). *Journal of second language writing*, 13(1), 49-62.
- Ferris, D. R., Hedgcock, J., & Hedgcock, J. S. (2013). *Teaching ESL composition: Purpose, process, and practice*. Routledge.
- Ferris, D., & Roberts, B. (2001). Error feedback in L2 writing classes: How explicit does it need to be?. *Journal of second language writing*, 10(3), 161-184.
- Hadiyanto, S. (2019). the effect of computer-mediated corrective feedback on the students' writing. *Language-Edu*, 8(2).
- HOSSEINI, S. B. (2013). THE IMPACT OF ASYNCHRONOUS COMPUTER-MEDIATED CORRECTIVE FEEDBACK ON INCREASING IRANIAN EFL LEARNERS'CORRECT USE OF PRESENT TENSES. *International Journal on New Trends in Education & their Implications (IJONTE)*, 4(1).
- Hyland, K., & Hyland, F. (2006). Feedback on second language students' writing. *Language teaching*, 39(2), 83-101.
- James, C. (2013). *Errors in language learning and use: Exploring error analysis*. Routledge.
- Kang, E., & Han, Z. (2015). The efficacy of written corrective feedback in improving L2 written accuracy: A meta-analysis. *The Modern Language Journal*, 99(1), 1-18
- Kepner, C. G. (1991). An experiment in the relationship of types of written feedback to the development of second-language writing skills. *The modern language journal*, 75(3), 305-313.
- Lalande, J. F. (1982). Reducing composition errors: An experiment. *The Modern Language Journal*, 66(2), 140-149.
- Li, M. M. (2009). Adopting varied feedback modes in the EFL writing class. *US-China Foreign Language*, 7(1), 60-63.
- Li, S. (2010). The effectiveness of corrective feedback in SLA: A meta-analysis. *Language Learning*, 60(2), 309-365.
- Littleton, C. E. (2011). *The role of feedback in two fanfiction writing groups*. Indiana University of Pennsylvania.
- Liu, J., & Sadler, R. W. (2003). The effect and affect of peer review in electronic versus traditional modes on L2 writing. *Journal of English for academic Purposes*, 2(3), 193-227.
- Razagifard, P., & Razzaghifard, V. (2011). Corrective feedback in a computer-mediated communicative context and the development of second language grammar. *Teaching English with Technology*, 11(2), 1-17.
- Robb, T., Ross, S., & Shortreed, I. (1986). Salience of feedback on error and its effect on EFL writing quality. *TESOL quarterly*, 20(1), 83-96.
- Russell, J., & Spada, N. (2006). The effectiveness of corrective feedback for the acquisition of L2 grammar. *Synthesizing research on language learning and teaching*, 13, 133-164.
- Sauro, S. (2009). Computer-mediated corrective feedback and the development of L2 grammar. *Language learning & technology*, 13(1), 96-120.
- Sheen, Y. (2007). The effect of focused written corrective feedback and language aptitude on ESL learners' acquisition of articles. *Tesol Quarterly*, 41(2), 255-283.
- Sheen, Y., & Ellis, R. (2011). Corrective feedback in language teaching. *Handbook of research in second language teaching and learning*, 2, 593-610.

- Shute, V. J. (2008). Focus on formative feedback. *Review of educational research*, 78(1), 153-189.
- Truscott, J. (1999). The case for "The case against grammar correction in L2 writing classes": A response to Ferris. *Journal of second language writing*, 8(2), 111-122.
- Truscott, J. (1999). The case for "The case against grammar correction in L2 writing classes": A response to Ferris. *Journal of second language writing*, 8(2), 111-122.
- Truscott, J. (2007). The effect of error correction on learners' ability to write accurately. *Journal of second language Writing*, 16(4), 255-272.
- Tuzi, F. (2001). E-Feedback's Impact on ESL Writers' Revisions.
- Tuzi, F. (2004). The impact of e-feedback on the revisions of L2 writers in an academic writing course. *Computers and composition*, 21(2), 217-235.
- Van Beuningen, C. G. (2011). The effectiveness of comprehensive corrective feedback in second. *Studies*, 10(2), 1-27.
- Van Beuningen, C. G., De Jong, N. H., & Kuiken, F. (2012). Evidence on the effectiveness of comprehensive error correction in second language writing. *Language learning*, 62(1), 1-41.
- Westmacott, A. (2017). Direct vs. indirect written corrective feedback: Student perceptions. *Íkala, revista de lenguaje y cultura*, 22(1), 17-32.
- Yeh, S. W., & Lo, J. J. (2009). Using online annotations to support error correction and corrective feedback. *Computers & Education*, 52(4), 882-892.

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