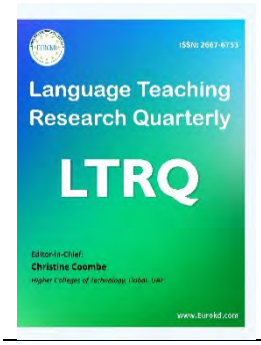

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Effects of Focused Written Feedback and Revision in the Development of Explicit and Implicit Knowledge in EFL Writing

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Abstract

This study investigated the effect of (a) direct written corrective feedback (WCF) and (b) opportunities for revision on the development of second language learners' explicit and implicit L2 knowledge in an EFL setting. Twenty-six intermediate-level university students were randomly divided into three groups: two treatment groups (direct feedback, direct feedback + revision), and a control group (no feedback). In a pretest-posttest design, over the span of six weeks, participants completed picture-prompted writing tasks, timed grammaticality judgment tests and error correction tests. Participants also produced two new writings with members of the direct feedback + revision group being given an opportunity to revise their writing. The results for the direct feedback group indicated accuracy gains in posttests. There was also some evidence that these gains were dependent on the structure targeted. However, there was no comparable improvement in the direct feedback + revision group. Therefore, it was not possible to interpret these effects as strong evidence for development of learners' L2 knowledge. Conversely, there was evidence that the direct feedback + revision group had benefitted from the opportunity to revise their writing.

Keywords: *Written Corrective Feedback, Implicit Knowledge, Explicit Knowledge, Direct Feedback, Focused Feedback*

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Introduction

In their recent overview, Bitchener and Storch (2016) observe that to date most written corrective feedback (WCF) research has focused on "the revised output (the product)" rather than "the cognitive processing of the feedback" (p. 4). A review of the literature suggests that this assessment is correct. While the number of studies investigating the differential effects of various types of WCF continues to grow, there has been scant attention paid to the role of WCF in the development of explicit and implicit knowledge of the L2. The study reported here was designed to add to our understanding of this underexplored area by investigating the effect of WCF on the development of explicit and implicit L2 knowledge among a group of university-level learners of English. Research also suggests that the effects of feedback is context-specific and varies depending on the learners' first language (Lyster & Mori, 2006; Sheen, 2004). However, previous studies have been mainly in ESL contexts, with few studies examining the role of WCF in EFL contexts with learners with different L1s (Nassaji & Kartchava, 2017). The focus of the present study was writing produced by Arabic-speaking learners of English studying in an EFL environment.

Literature Review

The literature surrounding WCF continues to grow, with studies being conducted in an effort to determine the differential effects of various types of WCF (e.g., Bitchener, 2008; Bitchener & Knoch, 2008a, 2008b, 2009a, 2009b; Ellis et al., 2008; Ferris, 2010; Frear & Chiu, 2015; Karim & Endley, 2019; Karim & Nassaji, 2018; Nemati et al., 2019; Sheen, 2007; Sheen et al., 2009; Shintani & Ellis, 2013; Yamashita, 2022). More recently, researchers have begun to explore other issues, including learner preferences for and engagement with different types of feedback (Kılıçkaya, 2022; Shen & Chong, 2022) and how learner-teacher relationships may impact WCF (Liu et al., 2022).

Despite a few dissenting voices (Truscott, 1996; Mohebbi, 2021), a large number of studies strongly suggest the effectiveness of WCF (e.g., Bitchener, 2008; Bitchener & Knoch, 2010; Ellis et al., 2008; Sheen, 2007; Shintani & Ellis 2013; Shintani et al., 2014; Sinha & Nassaji, 2022; Van Beuningen et al., 2012). However, while there is widespread agreement regarding the beneficial effects of WCF in general, there continues to be disagreement concerning the efficacy of specific types of feedback (direct vs. indirect; focused vs. unfocused)

A recent meta-analysis by Kang and Han (2015) concluded that there is no clear-cut evidence in the research literature concerning the comparative efficacy of direct versus indirect WCF. Some recent studies report an advantage for indirect feedback over direct feedback (e.g., Ferris, 2006; Sheen, 2007). Conversely, other studies report direct feedback to be more effective (e.g., Mirzaii & Aliabadi, 2013; Nemati et al., 2019; Van Beuningen et al., 2008; 2012; Yamashita, 2022). The two studies reported by Van Beuningen et al. (2008) and (2012) are of particular interest. The results of these two investigations showed more significant accuracy gains for direct feedback on new texts, although both direct and indirect feedback were effective for revised texts. It should also be noted, however, that Bitchener (2008) found that the two groups in his study that received metalinguistic feedback along with direct feedback outperformed the group which received direct feedback only. A similar finding is reported by Bitchener et al. (2005).

On the other hand, Bitchener and Knoch (2008a) found no significant difference between three treatment conditions (direct WCF, written and oral metalinguistic explanation, and direct WCF only). Sheen (2007) reported that the provision of indirect metalinguistic feedback led to superior performance compared with direct feedback. This finding contrasts with that of Shintani et al. (2014), who found a greater durability effect for direct WCF compared with metalinguistic explanation.

Among studies that have reported positive effects for feedback, some provided comprehensive (unfocused) feedback on all errors (e.g., Ferris, 2006; Karim & Nassaji, 2018; Liu, 2008; Truscott & Hsu, 2008; Van Beuningen et al., 2008; 2012). However, the majority of researchers have investigated focused feedback, targeting a limited number of grammatical structures. Among English grammatical structures, definite and indefinite articles have received considerable attention from researchers (e.g., Bitchener & Knoch, 2009a, 2009b; Ellis et al., 2008; Sheen, 2007; Sheen et al., 2009; Shintani & Ellis, 2013; Yamashita, 2022); other structures that have been investigated include the simple past tense, prepositions, and conditionals (e.g., Bitchener et al., 2005; Karim & Endley, 2019; Nemati et al., 2019; Shintani et al., 2014). Interestingly, some research indicates that the advantage for focused WCF is greater when the feedback is direct rather than indirect (e.g., Frear & Chiu, 2015; Nemati et al., 2019; Sheen, Wright et al., 2009). The present study followed the above tendencies in providing direct focused feedback on two target structures, namely, articles and prepositions.

Explicit and Implicit L2 Knowledge and Written Corrective Feedback

Within the second language research community the constructs of explicit and implicit knowledge have a centrally important role. What do these constructs involve? Ellis et al. (2006) state that "implicit knowledge" is "knowledge that learners are only intuitively aware of and that is easily accessible through automatic processing", whereas "explicit knowledge" consists of "knowledge that learners are consciously aware of and that is typically only available through controlled processing" (p. 340). Similarly, Bitchener and Storch (2016) state that implicit knowledge "can be used automatically and without conscious attention" (p. 12), whereas explicit knowledge "involves the learner in a controlled, conscious consideration of what constitutes target-like accuracy and appropriateness" (p. 12).

Implicit knowledge, then, is the knowledge that underlies and supports "real-time" communicative use of language, whether in comprehending the language of others or producing language oneself. It is procedural, involves intuitive awareness of what is linguistically correct, manifests a high degree of automation, is employed without conscious reflection and (typically) is not available for verbalization. It is possible (although this is disputed) that there are age-related constraints on the development of implicit knowledge. Explicit knowledge stands in contrast to all this. It is declarative and deliberative, non-automated, and can frequently be verbally expressed (e.g., as grammar "rules"). Moreover, there are grounds for thinking that explicit knowledge is not age-constrained.

An important strand of research has sought to investigate the relationship between the above constructs and L2 proficiency. An early example was Han and Ellis (1998), which, although limited in scope, revealed statistically significant correlations between the measures of implicit

and explicit knowledge and two commonly used English language proficiency tests (TOEFL and SPEAK).

Ellis (2005) reports a psychometric study, designed to enable the development of "a battery of tests that would provide relatively separate measures of implicit and explicit knowledge" (Ellis, 2005, p. 153). This study targeted participants' L2 knowledge of seventeen English grammar structures and used several types of test, including (for explicit knowledge) a metalinguistic knowledge test and an untimed grammaticality judgement test, and (for implicit knowledge) an imitation test, an oral narrative test and a timed grammaticality judgement test. Ellis' conclusion was noticeably modest: "it might be possible to develop tests that will provide relatively separate measures of implicit and explicit knowledge" (Ellis, 2005, p. 169).

Elder and Ellis (2009) report two studies considering the relationship between measures of the two types of L2 knowledge and two standardized English proficiency examinations, TOEFL and IELTS. For the first study, the researchers used one measure of implicit knowledge (a timed grammaticality judgement task) and two measures of explicit knowledge (an untimed grammaticality judgement task and a metalinguistic knowledge test). The key finding was that there was only a weak relationship between general proficiency and implicit knowledge; explicit knowledge of the L2, on the other hand, was a stronger predictor of general L2 proficiency. In the second study a second measure of implicit knowledge – an elicited imitation task – was introduced. Results indicated that both implicit and explicit knowledge of the target structures correlated with general proficiency.

Zhang (2015) reports an investigation of the relationship between implicit and explicit knowledge of L2 English and general English proficiency in a Chinese setting. Four measures were employed: an elicited imitation task and a timed grammaticality judgement task (implicit knowledge) and an untimed grammaticality judgement task and a metalinguistic knowledge task (explicit knowledge). Contrary to Elder and Ellis (2009), Zhang reports that only the two measures of implicit knowledge were found to predict participants' general English proficiency score.

It is now widely accepted in the SLA research community that provision of feedback has a positive effect both on L2 learners' accuracy and, more generally, on the development of their writing skills. As we have already noted, however, to date little attention has been paid to the potential of WCF to facilitate the development of L2 knowledge (Bitchener & Storch, 2016).

One study that did consider the effect of feedback on L2 knowledge is Shintani and Ellis (2013), comparing the effect of direct WCF and metalinguistic explanation on learners' knowledge of the English indefinite article. The researchers report that the provision of direct WCF did not appear to have an effect on the accurate use of the target structure, suggesting that feedback did not facilitate development of either explicit or implicit knowledge. Conversely, the provision of metalinguistic explanation led to gains in accuracy in the both the error correction test and in a new piece of writing completed immediately after the treatment (but not in a delayed posttest). They interpret this finding to mean that metalinguistic explanation positively affected the participants' explicit L2 knowledge. However, the fact that the effect was not durable indicated that it had no effect on their implicit knowledge.

Jiang and Xiao (2014) report an eight-week study of the differential effects of two types of direct WCF on the L2 knowledge of low-intermediate learners of English. The findings indicated that the treatment groups benefitted from the provision of WCF, outperforming the control group on both the measure of explicit knowledge and the measure of implicit knowledge. The researchers concluded that direct WCF coupled with metalinguistic explanation may be superior in developing implicit L2 knowledge than direct feedback alone. Nemati et al. (2019) report an investigation into the effect of direct and indirect focused WCF on the acquisition of the English past tense in an EFL setting. The researchers cautiously conclude that the provision of focused, direct WCF resulted in improved explicit and implicit knowledge of the target structure.

Written Corrective Feedback and the Role of Revision

If, as Storch observes, "learning requires extensive and sustained meaningful exposure and practice" (Storch, 2010, p. 42), providing learners with sufficient time to study the feedback they receive, and allowing opportunities to incorporate it into revised drafts, is likely to facilitate the process of noticing and lead to improved uptake of grammatical features. Only a few studies (e.g., Chandler, 2003; Shintani et al., 2013; Karim & Nassaji, 2018; Karim & Endley, 2019) have attempted to investigate this issue empirically even though, as Chandler pithily noted some years ago, "having the students do something with the error correction besides simply receiving it" might well be regarded as a crucial factor (Chandler, 2003, p. 293).

This is borne out by Chandler's own research where it is reported that the control group, which did not revise, did not increase in accuracy. The experimental group, on the other hand, showed a significant increase in accuracy. Chandler concludes that "if students did not revise their writing based on feedback about errors, having teachers mark errors was equivalent to giving no error feedback since the students' new writing did not increase in correctness over one semester" (p. 280).

Another study incorporating opportunities for revision is reported by Shintani et al. (2014). The main findings were as follows: direct WCF led to longer lasting improvements in accuracy than WCF with metalinguistic explanation; secondly, opportunity for revision enhanced the effect of the feedback, with direct WCF followed by revision being the most effective type of feedback, at least for the hypothetical conditional. Karim and Nassaji (2018) report the effects of comprehensive WCF on L2 learners' revision accuracy and new pieces of writing, comparing different types of feedback: direct feedback and two types of indirect feedback that differed in their degree of explicitness (i.e., underlining only and underlining + metalinguistic cues). All three feedback groups significantly outperformed the control group in revision tasks, indicating that both direct and indirect comprehensive WCF can improve learners' accuracy during the revisions of the same texts. Karim and Endley (2019) investigated both the revision and transfer effects (effects on new pieces of writing) of focused WCF. They report that in the first revision session, one type of indirect WCF (underline-only) was more effective than direct WCF. On the other hand, direct WCF was more successful than both types of indirect WCF in revision session. The researchers tentatively interpret their findings as an indication that when feedback is provided on multiple occasions, it is likely to be more effective for both revision and L2 development.

In short, there is some support for the hypothesis that providing participants with opportunities to revise their work following the provision of feedback may lead to increase in learning. The present study was designed to further investigate this hypothesis by examining the effect of written corrective feedback on the development of both explicit and implicit L2 knowledge when students have opportunities to revises versus when they do not.

The Study

The study presented here was designed to contribute to our understanding of the effect of direct, focused written corrective feedback on the development of explicit and implicit L2 knowledge, particularly when this feedback is combined with opportunities for revision.

Research Questions

The following research questions were addressed:

RQ_1: What is the effect of direct written feedback on the development of EFL learners' explicit and implicit knowledge of L2 grammar?

RQ_2: Does the effect of feedback on each type of knowledge (if any) vary depending on the type of target structure (articles versus prepositions)?

RQ_3: What is the effect of students' revisions on the development of EFL learners' explicit and implicit knowledge of L2 grammar?

Method

The study was conducted at United Arab Emirates University (UAEU), an English-medium university located in the United Arab Emirates. The participants were pre-major students attending the University Foundation Program (UFP) within the university. All the participants were female, intermediate-level English speakers with Arabic as their first language. Their ages ranged from 18 to 20 years. The study targeted two structures central to the grammatical system of English: (a) definite and indefinite articles and (b) spatial prepositions. Two factors determined the choice of target structures. Firstly, articles were selected to facilitate comparison with the other recent studies (e.g., Bitchener & Knoch, 2009a, 2009b; Ellis et al., 2008; Jiang & Xiao, 2014; Sheen, 2007; Sheen et al., 2009; Shintani & Ellis, 2013; Yamashita, 2022). The decision to include prepositions as an additional target structure was taken since they have received little attention in previous studies. Secondly, there is evidence that Arabic-speaking learners of English typically encounter difficulties with both of these structures (e.g., Al-Qadi, 2017; Al Yaari & Almaflehi, 2013; Crompton, 2011). A further significant design feature is that, as with Shintani and Ellis (2013), the present study investigated the effect of direct WCF on both a revised text and in new pieces of writing.

The data used for analysis consisted of written texts produced over a period of six weeks. The study was quasi-experimental in design, involving a pre-test, treatment sessions, and two post-tests. In the pretest, posttests, and two new writing tasks, picture-cued tasks were employed. The pictures consisted of various rooms in a house, containing typical items (e.g., TV, table lamp, fireplace, sofa etc.). For the pretest and two posttests, a timed grammaticality judgment task (GJT) was used as a measure of implicit knowledge and an untimed error correction task (ECT) as a

measure of explicit knowledge. The timed GJT comprised 40 questions, 20 targeting articles and 20 targeting prepositions; the ECT comprised 20 questions, 10 targeting articles and 10 targeting prepositions.

Two of the groups received direct feedback (DCF and DCF + Rev) on their writing; the third group did not receive any feedback (Control Group). Data was collected over a period of six weeks. Participants in DCF + Rev group were given an opportunity to revise their texts after receiving WCF from the researchers (i.e., ten minutes to review their texts with the corrections and 30 minutes to revise the first draft of the text 1). They were asked to revise all the errors corrected. Participants in DCF group also received WCF but were not given an opportunity to revise their texts. Thus, the study involved a key between-group independent variable: (+/- revision). The control group did not receive feedback but completed the pretests and posttests, and only produced new texts from picture prompts. All participants were instructed to produce a minimum of 10 sentences from the picture-prompted writing tasks.

The following table summarizes the data collection plan and procedure:

Table 1

Data Collection Plan and Procedure

Week 1	(All groups) Pre-test: (a) Prompted writing (b) Timed GJT (c) ECT
Week 2	Day 1 (All groups) Writing 1 (new prompt) Day 2 (DCF + Rev group only) Revision of writing following feedback
Week 3	Day 1 (All groups) Writing 2 (new prompt) Day 2 (DCF + Rev group only) Revision of writing following feedback
Week 4	(All groups) 1st Post-test: (a) Prompted writing (b) Timed GJT (c) ECT
Week 6	(All groups) 2nd Post-test: (a) Prompted writing (b) Timed GJT (c) ECT

Scoring involved counting the number of incorrect usages of target forms (either an incorrectly supplied form or no form supplied in an obligatory context). This figure was divided by the number of obligatory contexts, with the sum multiplied by 100 to obtain a percentage.

Results

In order to confirm that the participants in the three groups began the study with similar writing proficiency, a one-way ANOVA was performed on the accuracy rates for the picture-cued writing task. The results showed there was no significant difference between the mean error rates for articles and prepositions among the groups (Articles: F (2, 25) = .156, p = .857; Prepositions: F (2, 25) = .021, p = .979). This indicates that the four groups were similar in terms of their writing proficiency (Table 2).

Table 2

Accuracy Rates for the Use of Articles and Prepositions in the Picture-cued Writing Pre-test

Group	Accuracy rates in articles	
	M	SD
DCF + Rev	85.9	12.4
DCF	87.9	11.5
NoCF	88.6	7.7
	Accuracy rates in prepositions	
	M	SD
DCF + Rev	70.9	11.2
DCF	69.1	20.1
NoCF	69.0	26.1

Descriptive statistics for the grammaticality judgement tasks, error correction tasks, and picture-cued writing pre-test are reported below followed by the results of the two writing tasks. Accuracy rates for article and prepositions are reported separately for the GJT (pre- and post-tests), ECT (pre- and post-tests) and all the writing pre- and post-tests as well as for the two writing tasks.

Overall Results for Timed Grammaticality Judgment Tasks

The overall results for the timed grammaticality judgment tasks (i.e., the measure of implicit knowledge) are presented in Table 3.

Table 3

Accuracy Rates in Timed GJT (Articles & Prepositions Combined)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	72.8	4.5	63.4	7.4	65.0	9.6
DCF	60.0	10.0	63.2	9.2	64.6	9.9
NoCF	62.7	8.8	66.8	7.5	65.6	11.4

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in pretest: F (2, 25) = 5.43, p <.012, ηp^2 =.321; in posttest 1: F (2, 25) = .609, p <.553, ηp^2 =.050; in posttest 2: F (2, 25) = .023, p < .977, ηp^2 = .002). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest. Nor was any significant difference observed in accuracy gains among the three groups in posttest 1 and posttest 2.

Accuracy in Use of Articles in Timed Grammaticality Judgement Tasks

Descriptive statistics for the accuracy in the use of articles in the grammaticality judgment tests are presented in Table 4.

Table 4

Accuracy Rates in Timed GJT (Articles Only)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	65.0	8.8	63.7	10.6	64.3	13.2
DCF	55.7	7.3	56.4	13.1	60.7	11.7
NoCF	57.7	8.4	66.3	8.9	66.3	14.5

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in pretest: F (2, 25) = 2.72, p <.087, ηp^2 =.192; in posttest1: F (2, 25) = 1.88, p <.174, ηp^2 =.141; in posttest 2: F (2, 25) = .379, p < .689, ηp^2 = .032). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest and the two posttests.

Accuracy in Use of Prepositions in Timed Grammaticality Judgement Tasks

Descriptive statistics for the accuracy in the use of prepositions in the grammaticality judgment tests are presented in Table 5.

Table 5

Accuracy Rates in Timed GJT (Prepositions Only)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	80.6	6.7	63.7	6.4	65.6	13.2
DCF	64.2	15.9	70.0	9.5	67.8	14.6
NoCF	67.7	13.2	67.2	10.8	65.0	13.0

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in the pretest: F (2, 25) = 3.73, p <.039, ηp^2 =.245; in posttest1: F (2, 25) = .850, p <.441, ηp^2 = .069; in posttest 2: F (2, 25) = .099, p < .906, ηp^2 = .009). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest and the two posttests.

Overall Results for Error Correction Tasks

Descriptive statistics for the error correction tasks (i.e., the measure of explicit knowledge) are presented in Table 6.

Table 6

Accuracy Rates in ECT (Articles & Prepositions Combined)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	58.1	14.8	42.5	8.8	45.6	14.7
DCF	58.5	9.8	56.4	20.7	55.7	10.9
NoCF	36.3	15.8	43.1	18.8	43.6	15.3

One-way ANOVAs revealed that there was a significant difference in accuracy rates among the three groups in the pretest (F (2, 25) = 7.59, p <.003) with an effect size using partial eta squared (ηp^2) = .398, representing large effect. (Following Cohen (1988), values between .01–.05 are considered to be small effect sizes, values between .06 –.13 are considered medium, and values greater than or equal to .14 are considered large effects.). In posttest1 and posttest2, there was no significant difference in accuracy rates (Posttest1: F (2, 25) = 1.61, p <.221, ηp^2 =.123; in Posttest 2: F (2, 25) = 1.66, p < .212, ηp^2 = .126). For the pretest, post-hoc multiple comparisons using Bonferroni adjustment revealed that there was a significant difference between the DCF + Rev group and No CF group and also between DCF group and No CF group. No significant difference was observed in accuracy gains among the three groups in posttest 1 and posttest 2.

Accuracy in Use of Articles in Error Correction Tasks

Descriptive statistics for the accuracy in the use of articles in the grammaticality judgment tests are presented in Table 7.

Table 7

Accuracy Rate in ECT (Articles)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	66.2	20.6	55.0	14.1	45.0	20.7
DCF	68.5	10.6	64.2	23.7	57.1	13.8
NoCF	37.2	21.0	50.0	14.1	47.2	22.4

One-way ANOVAs revealed that there was a significant difference in accuracy rates among the three groups in the pretest (F (2, 25) = 8.17, p <.002) with an effect size using partial eta squared (ηp^2) = .416, representing large effect. In posttest1 and posttest2, there was no significant difference in accuracy rates (Posttest1: F (2, 25) = 1.48, p <.247, ηp^2 =.114; in Posttest 2: F (2, 25) = .783, p < .469, ηp^2 = .064). For the pretest, post-hoc multiple comparisons using Bonferroni adjustment revealed that there was a significant difference between the DCF + Rev group and the No CF group and also between the DCF group and the No CF group. No significant difference was observed in accuracy gains among the three groups in posttest 1 and posttest 2.

Accuracy in Use of Prepositions in Error Correction Tasks

Descriptive statistics for the accuracy in the use of prepositions in the error correction tests are presented in Table 8.

Table 8

Accuracy Rate in ECT (Prepositions)

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	50.0	16.9	30.0	18.5	46.2	16.8
DCF	48.5	10.6	48.5	25.4	54.2	16.1
NoCF	35.4	20.1	38.1	30.2	40.0	15.4

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in the pretest: F (2, 25)= 2.09, p <.146, ηp^2 =.154 ; in posttest 1 :F (2, 25)= .960, p <.398, ηp^2 = .077; in posttest 2: F (2, 25) = 1.69, p < .207, ηp^2 = .128). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest and the two posttests.

Results for Writing Tasks (Pre- and Posttests)

Accuracy in Use of Articles

Considering articles, the DCF + Rev group did not improve in accuracy at all; in all three tests the accuracy score remained almost same. Conversely, the DCF group displayed gains in accuracy in posttest 1 and 2. Interestingly, the No CF group also showed a steady gain in accuracy in the two posttests.

Table 9

Descriptive Statistics for the Accuracy in the Use of Articles in the Picture-cued Writing Tests

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	85.9	12.4	85.8	14.3	85.0	16.3
DCF	87.9	11.5	96.3	4.8	93.0	13.4
NoCF	88.6	7.7	92.1	8.7	94.8	5.9

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in pretest: F (2, 25) = .156, p <.857, ηp^2 =.013; in posttest1: F (2, 25) = 2.09, p <.146, ηp^2 =.154; in posttest 2: F (2, 25) = 1.63, p < .216, ηp^2 = .125). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest and the two posttests.

Accuracy in Use of Prepositions

For prepositions it can be seen that the DCF + Rev group displayed a steady improvement in accuracy in posttest 1 and that this was maintained in posttest 2. The DCF group also displayed gains in accuracy in posttests 1 and 2. As was the case for articles, the No CF group gained in accuracy in posttest 1, but accuracy declined in posttest 2.

Table 10

Descriptive Statistics for the Accuracy in the Use of Prepositions in the Picture-cued Writing Tests

Group	Pretest		Posttest1		Posttest 2	
	M	SD	M	SD	M	SD
DCF + Rev	70.9	11.2	75.0	23.9	77.5	9.5
DCF	69.1	20.1	73.7	22.4	76.7	17.9
NoCF	69.0	26.1	72.6	22.2	65.6	21.0

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the pretest and two posttests (in the pretest: F (2, 25) = .021, p <.979, ηp^2

=.002; in posttest1: F (2, 25) = .117, p <.890, ηp^2 = .010; in posttest 2: F (2, 25) = 1.39, p < .267, ηp^2 = .108). Post-hoc multiple comparisons using Bonferroni adjustment revealed that there were no significant differences between the three groups in the pretest and the two posttests.

Results for the Two Writing Tasks

The results for accuracy in articles and prepositions in the two writing tasks are presented separately. As it can be seen from Table 11, all three groups gained in accuracy in using articles from Writing 1 to Writing 2.

Table 11

Accuracy Rate in Writing Tasks (Articles)

Group	Writing 1		Writing 2	
	M	SD	M	SD
DCF + Rev	86.6	12.4	89.4	11.8
DCF	92.8	10.9	97.1	2.7
NoCF	87.5	16.4	91.0	12.1

One-way ANOVAs revealed that there was no significant difference in accuracy rates among the three groups in the Writing 1 and 2 (in Writing 1: F (2, 25) = .435, p <.653, ηp^2 = .036; in Writing 2: F (2, 25) = 1.11, p <.346, ηp^2 = .088). Post-hoc multiple comparisons using Bonferroni adjustment displayed that the difference between the DCF + Rev group and the DCF group and between the DCF group and the No CF group did not reach statistical significance.

Turning to prepositions, Table 12, shows that the DCF + Rev group increased in accuracy from Writing 1 to Writing 2. On the other hand, both the DCF and the No CF groups displayed a clear decrease in accuracy in the use of prepositions from Writing 1 to Writing 2.

Table 12

Accuracy Rate in Writing Tasks (Prepositions)

CF Type	Writing 1		Writing 2	
	M	SD	M	SD
DCF + Rev	72.3	19.3	76.9	21.9
DCF	71.4	19.8	65.4	32.0
NoCF	79.7	16.1	59.1	23.0

One-way ANOVAs revealed that there was no significant difference in accuracy rates in the use of prepositions among the three groups in the Writing tasks 1 and 2 (Writing task 1: F (2, 25) = .647, p <.533, ηp^2 = .053; Writing task 2: F (2, 25) = 1.14, p <.335, ηp^2 = .091). Post-hoc multiple comparisons using Bonferroni adjustment displayed that there was no significant difference between the DCF + Rev group and the DCF group or between the DCF group and the No CF group.

Discussion

Overall, the results do not indicate a clear effect for direct feedback with regard either to participants' implicit knowledge or their explicit knowledge. With regard to implicit knowledge, Table 3 shows that the DCF group improved in post-test 1 and this improvement was sustained in post-test 2. As Shintani and Ellis observe, "Implicit knowledge is durable (i.e., once it is acquired it is not easily lost) whereas explicit L2 knowledge, like other types of declarative knowledge, can be easily forgotten" (Shintani & Ellis, 2014, p. 291). Therefore, the sustained improvement shown by the DCF group lends some support to the claim that the provision of feedback led to development in implicit knowledge. Unfortunately, the absence of any comparable improvement in the DCF + Rev group, coupled with the fact that the performance of the No CF group also improved, means that we cannot safely conclude that the improvement shown by the DCF group was due to the provision of feedback.

A similar picture emerges with regard to explicit knowledge. As shown in Table 6, the performance of the DCF + Rev group decreased in both posttests compared with their initial pre-test performance. The DCF group's accuracy also declined steadily in both posttests. Surprisingly, the No CF group displayed steady improvement in posttests 1 and 2. Such findings must be described as inconclusive at best. Put otherwise, there was no clear evidence for an effect of direct WCF on the development of L2 knowledge. This finding is consistent with Shintani and Ellis (2013), who likewise found no effect for direct corrective feedback in either their error correction task or in terms of participants' accuracy. On the other hand, the finding is inconsistent with Jiang and Xiao (2014) and with Nemati et al. (2019), both of which report a positive effect for direct corrective feedback on both explicit and implicit knowledge.

Despite the lack of clear evidence for an effect for direct feedback overall, it is possible that there was an effect for one or other of the target structures and that this effect is masked when the data for the two structures is combined. Comparison of Tables 4 and 5 reveals interesting differences in the performances of the groups in the timed GJT even though these did not reach statistical significance. Thus, there is some (albeit weak) evidence that the type of target structure may play a part in determining the effect of direct WCF on implicit L2 knowledge. What of the participants' explicit knowledge of the two target structures in the present study? For articles, Table 7 shows that the performance in the ECT of both treatment groups decreased across the two posttests. Thus, there was no evidence of a positive effect for direct feedback on explicit knowledge so far as articles are concerned. For prepositions, Table 8 shows that the ECT performance of the DCF + Rev group again decreased across the two posttests whereas the performance of DCF group improved. Consequently, this study provides only weak support for the contention that type of structure played a role in determining the effect of direct feedback on the development of explicit L2 knowledge.

While both treatment groups received direct WCF, members of the DCF + Rev group were additionally given an opportunity to revise their writing. The results suggest that the opportunity to revise had a positive effect on the development of L2 knowledge and, moreover, that this effect may have varied in dependence on the structure targeted.

For articles, Table 11 shows that all three groups improved from Writing 1 to Writing 2. This suggests that so far as articles are concerned the opportunity to revise afforded to the DCF + Rev group did not make a major difference in terms of their performance. The fact that the differences between the groups were not statistically significant supports this contention. This finding is contrary to some other studies (e.g., Bitchener & Knoch, 2010; Ellis et al., 2008), which have reported positive effects for direct feedback on the accurate uses of articles both in revised and new pieces of writing. For prepositions, Table 12 shows that only the DCF + Rev group improved from Writing 1 to Writing 2. The performances of the DCF group and the No CF group, neither of which revised, actually declined from Writing 1 to Writing 2. While the differences between the groups did not reach statistical significance, the improved performance of the DCF + Rev group in their use of prepositions, when compared with the other two groups, is interesting and may indicate that the effect of revision varies depending on the targeted structure. Caution is necessary in interpreting this result. The fact that there was an improvement in the DCF + Rev group's use of prepositions following revision cannot be taken as evidence of a development of implicit knowledge since in writing tasks participants may access both explicit and implicit knowledge (cf. Shintani & Ellis, 2013).

Conclusions

The findings demonstrated that the DCF group displayed accuracy gains (in prepositions and articles combined) in timed GJT post-test 1 and this gain was sustained in post-test 2. The researchers interpret this as the effect of direct WCF on implicit knowledge. However, in terms of explicit knowledge, the accuracy rate of the DCF + Rev group decreased in both posttests compared with their initial pre-test performance, as did the DCF group's accuracy. Conversely, the No CF group displayed steady improvement in posttests 1 and 2 and no comparable improvement in the DCF + Rev group was evident. Thus, there was no clear-cut evidence for an effect of direct WCF on the development of L2 implicit and explicit knowledge. Concerning the question whether the effects of WCF on implicit and explicit knowledge is dependent on the type of target structure, it was found that the DCF group displayed better accuracy gains in articles in two timed GJT posttests compared to the DCF + Rev group. Surprisingly, the No CF group also displayed improvement in the two timed GJT posttests. With regard to prepositions, once again the DCF group gained accuracy in both timed GJT posttests. Thus, although not strong, there is some evidence that the type of target structure might have contributed to the effect of direct WCF on participants' implicit L2 knowledge.

In terms of explicit knowledge, neither treatment group displayed accuracy gains in articles in the ECT posttests. However, for prepositions, the DCF group displayed accuracy gains in both posttests. Once again, the No CF group gained accuracy in articles and in prepositions in both posttests. Thus, it is not possible to make a strong claim that DCF helped in developing explicit L2 knowledge.

Turning to the question of whether there was a revision effect on the development of learners' explicit and implicit knowledge, the comparative results of Writing 1 and Writing 2 demonstrated that while the DCF + Rev group did not outperform the other two groups in accuracy gains in

articles, they displayed accuracy gains in prepositions from Writing 1 to Writing 2. Thus, there was some positive effect of feedback on accuracy improvement in writing; however, this cannot be interpreted as strong evidence of development of learners' implicit knowledge.

It is striking that the DCF group showed improvements in accuracy, indicating that direct WCF has potential learning value. Accuracy gains in prepositions in the revision tasks also suggest the merit of focused direct WCF as well as of revision tasks in reducing errors in L2 writing at the intermediate level. In other words, the findings of the current study once again demonstrate that focused WCF is a useful pedagogical tool for L2 teachers to help learners improve their accuracy in writing. The present study adds to our understanding of the potential effects of WCF on the improvement of implicit and explicit knowledge, especially when the feedback is combined with opportunities for revision. Nonetheless, the limitations of the study should be kept in mind. Firstly, the sample size was relatively small and future research should aim to use larger sample sizes. On the other hand, it must be emphasized that participants in this study produced five new writings and one group revised two of those writings. Thus, the researchers were able to gather a substantial amount of data for analysis. Finally, while attempts were made to make picture prompts similar, it is possible that the degree of difficulty of the prompts varied. In other words, a potential task effect cannot be ruled out. Such an effect might account for some of the differences in the effect of feedback on both revision and accuracy of new writings.

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