Effect of Language Learning Strategies and Teacher versus Peer Feedback on Reducing Lexical Errors of University Learners

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Abstract: *This study examined the effects of language learning strategies (LLS) and coded corrective feedback on reducing four types of lexical errors made by two student groups, one receiving teacher corrective feedback (TCF) and the other peer corrective feedback (PCF). Participants (n=34) were divided into two groups; one group (n=17) received TCF and the second group (n=17) received PCF. Both groups were trained in applying LLS to revise, in response to their respective feedback, coded lexical errors they had made in three practice essays. The study used the Sequential Explanatory strategy of the Mixed Methods' Design Strategies to compare the groups' lexical error performance on immediate and delayed post-tests. Findings showed that participants in the PCF group significantly outperformed their TCF counterparts and reduced overall lexical errors at the delayed post-test (week 16). Also, the PCF group reduced 'unnecessary' and 'redundant' word errors at the delayed post-test, though not significantly. Analysis of students' reflections, written after training, revealed that students depended on gut feeling and prior experience to revise their errors; they restructured sentences when they could not correct lexical errors and considered collocation errors difficult to correct. Pedagogical implications include adopting specific methods of vocabulary teaching and meaningful error feedback.*

1. Introduction

Writing is an important skill "for learning and expressing what students know" (Bai 2018: 2), and since writing in English is at the heart of international communication today, researchers have stressed several skills that can develop L2 English writing. Tamimi (2017) asserted that the effectiveness of L2 classrooms relies heavily on integrating technology into L2 curricula, teaching materials and writing activities, while Fareh and Hamadi (2019) contended that L2 learning encompasses both speaking and writing in culturally sensitive contexts. On the other hand, Carrio-Pastor and Mestre-Mestre (2014) recommended that students studying English as a Foreign Language (EFL) learn to make correct word choices when writing as word choice errors weaken L2 writing. To improve students' L2 lexical choices, EFL teachers generally examine the types and frequencies of word choice errors which students make in their writing and provide feedback on these errors to help students correct them (Pilar Augustin Llach 2015). However, when corrective feedback on these errors is indirect, students face difficulty in correcting them (Diab 2006) as they do not understand why a certain word is wrong and hence may not be able to

correct it. Training EFL students to apply language learning strategies when responding to corrective feedback on lexical errors may help students improve their lexical accuracy as "using strategies … enhance student engagement with feedback and facilitate uptake" (Lee 2013:113).

1.1 Language learning strategies

Language learning strategies (LLS) are defined as 'the learner's consciously chosen tools for active self-regulated improvement of language learning' (Oxford, Rubin, Chamot, Schramm, Lavine, Gunning and Nel 2014:30). LLS allow learners to adopt a problem-solution approach to learning by teaching them how to break down a task and analyse its components to arrive at a solution. When writing, students take time to ponder over their word choices, analyse their appropriateness in each context, compare them to other possible terms in that context, eliminate the unsuitable alternatives then select what they consider as the most appropriate terms. Another advantage of LLS is that their use may increase learners' chances of arriving at a correct term. In a meta-analysis of 123 writing intervention studies, Graham and Perin (2007) ranked strategy instruction first among a list of ten instructional writing practices as it gained the highest average weighted effect size (0.82 for grades 1-4 and 0.70 for adolescents in general). Thus, the advantages of strategy instruction in developing students' language learning may help students understand corrective feedback on their lexical errors.

1.2 Effect of corrective feedback on L2 writing

Teachers have traditionally been the providers of corrective feedback given their expertise (Bacha and Bahous 2011) and the trust students have in teachers' ability to provide clear and relevant feedback. Several researchers have argued for the success of focused teacher corrective feedback (TCF) in reducing ESL and EFL student errors when using the definite and indefinite English article (Bitchener and Knoch 2010; Suzuki, Nassaji and Sato 2019). Others (Storch and Wigglesworth 2010; Van Beuningen, De Jong and Kuiken 2012) demonstrated the impact of comprehensive direct and indirect feedback on L2 students' uptake and retention of grammatical errors (verb tenses, sentence structure, etc.) and non-grammatical ones. Results of Storch and Wigglesworth (2010) revealed that uptake and retention are influenced by error type and affective factors. Moreover, direct feedback influenced grammatical accuracy while indirect feedback reduced non-grammatical errors (Van Beuningen et al. 2012). A recent study (Khreisat and Mugableh 2021) reported that students attributed 50% of the effectiveness of L2 writing classrooms to teachers' feedback, 25% to activities requiring collaboration between teachers and students and another 25 % to student autonomy. Moreover, Ganapathy, Tan and Phan (2020) concluded that TCF significantly improved students' L2 writing skills.

However, since the 1990s, L2 researchers have examined students' ability to edit each other's writing and give meaningful and timely feedback to their peers. Many researchers considered peer corrective feedback (PCF) a useful learning tool that improves EFL writers' sense of audience (Lundstrom and Baker 2009) and

develops their autonomy (Yang, Badger and Zhen 2006). Moreover, Chamot (2001:39) described peer feedback as a teachable skill "invaluable in integrating learning strategies into language instruction" while Nicol, Thompson, and Breslin (2014) argued that peer feedback shifts the control of feedback into students' hands, thus reducing the need for teacher feedback. Recently, Huisman Saab, van der Broek, and van Driel (2018) conducted a meta-analysis of 24 quantitative peer feedback studies that investigated the effect of peer feedback on developing academic writing. The study concluded that peer feedback yields better results than self-feedback and no feedback. More recently, Fan and Xu (2020) found that student engagement with peer feedback played a crucial role in improving L2 writing (see review of TCF, PCF, and comparative TCF/PCF studies in sections 2.2, 2.3, 2.4 below).

1.3 Lexical errors
Although lexical errors are quite common in students' L2 writing (Mawlawi Diab 2010; Han and Hyland 2015), they have not received sufficient attention in the literature on TCF as they are considered "untreatable", i.e., not based on grammatical rules (Ferris 2006), thus "less amenable to self-correction" (Lee 2013:111). In contrast, many EFL research studies conducted error analysis on Arab students' EFL writing to find the reasons for their language errors, including lexical errors. Mahmoud (2005) examined the lexical errors of 42 Arab EFL university students whose major is English. Analysis of students' essays revealed 420 collocations, 80 percent of which were lexical collocation errors. Results were mostly attributed to negative transfer from Arabic. Another study (Shalabi and El-Komi 2009) investigated the lexical errors 96 female Saudi EFL university students had made in essay writing. Of the 718 errors, wrong choice of a suffix was the most common error followed by direct translation from Arabic. More recently, Nuruzzaman and Shafiqul Islam (2018) investigated the errors of 90 undergraduate EFL Saudi students of different proficiency levels. Results revealed errors in grammar, lexis, semantics and mechanics. Similarly, Ahmad and Othman (2019) investigated the lexical errors 30 Saudi EFL university students had made in their English writing. Interviews with instructors revealed that students' lexical errors were due to L1 interference and insufficient knowledge of vocabulary. However, these studies did not involve training students in the use of LLS strategies to reduce their errors.

Given the importance of correct word choice in clear writing (Carrio-Pastor and Mestre-Mestre 2014), the significance of the present study is that it addresses two gaps. 1. It investigates whether students' task of making correct word choices in writing may be facilitated by receiving training in LLS to help students understand indirect corrective feedback. 2. It investigates whether students trained in the use of LLS would reduce lexical errors more in response to TCF or PCF. Accordingly, this study addresses the following research questions:
1. Are there any statistically significant differences between TCF and PCF groups on reducing students' overall word choice errors in new essays written at immediate and delayed post-tests?

2. Are there any statistically significant differences in reducing specific word choice errors made by TCF and PCF groups on immediate and delayed post-tests?
3. What are students' perceptions of the language learning strategies they use and the difficulties they encounter while revising word choice errors?

With respect to the first research question, the researchers hypothesized that the group receiving TCF and LLS training would have fewer lexical errors than the group receiving PCF and LLS training as students trust teachers' feedback more than peer feedback (Yang, Miao, Badger and Yu 2006) and are therefore more likely to internalize it with repeated practice (see Anderson 1985 below). For research question 2, the researchers hypothesized that 'collocation' errors, which are affected by contextual factors may prove harder to reduce than other lexical errors (Mawlawi Diab 2016). Research question 3 remains unaddressed here (it is, however, addressed later on).

1.4 Theoretical framework
The present study is framed in language learning strategy theory. This theory maintains that some students learn a language better than others and that "other things being equal, at least part of this differential success rate [in students' language learning] is attributable to the varying strategies which different learners bring to the task" (Griffith 2004:10). Hence, language learning is a cognitive process like other learning processes as it involves students' conscious effort to learn a skill.

Moreover, this study is framed in Anderson's ACT*(1985) Adaptive Control of Thought theory, which involves three learning stages: cognitive, associative, and autonomous. At the cognitive stage, learners focus hard on acquiring declarative knowledge (in this case, correct word choices), which requires a lot of effort to learn. At the associative stage, students use production systems to apply their declarative knowledge in their writing, thus turning it into procedural (applied) knowledge. At this stage, students still make some errors in their word choice. Repeated application of production systems would enable students to reach the autonomous stage and arriving at correct word choices becomes effortless and automatic.

The above two theories provide a framework that may explain how students trained in LLS may make use of their training to revise their lexical errors in response to TCF or PCF and reduce these errors. According to O'Malley and Chamot (1990), LLS are production systems, each including one condition (IF) followed by one action clause (THEN) or more as in the example below:

IF a word does not add new meaning to a sentence, *THEN* I should delete it (italics and capitalization in original).

O'Malley and Chamot (1990) argue that production systems could be learnt using Anderson's (1985) ACT* theory. Thus, the application of O'Malley and Chamot's (1990) production systems to correct lexical errors would proceed as follows: At the cognitive stage, students learn new lexical terms from class readings and use them in their writing (declarative knowledge). At the associative stage, students apply LLS to revise their lexical errors in response to feedback. This process can

raise students' awareness of their errors, help them understand why a certain lexical term is wrong, and correct it, thus changing declarative knowledge to procedural knowledge. With repeated practice of LLS to correct their lexical errors, students' learning moves to the autonomous stage where they internalize the correct use of lexical terms and apply them correctly and effortlessly.

2. Literature review
2.1 Research on language learning strategies
Several research studies have examined the effect of strategy instruction on strategy use in EFL writing. These studies found that strategy instruction helped EFL learners develop strategy awareness and use (De Silva and Graham 2015; Rajasekhar 2019) as well as enhanced self-efficacy (Khokhar and Sangi 2018). Other researchers found that students' learner characteristics may be critical in measuring the effectiveness of self-regulated writing strategies (Teng and Huang 2019).

However, LLS studies examining the influence of specific strategies on students' lexical choices are scarce. Using student think-aloud protocols, Hu and Nassaji (2014:30) learnt that the metacognitive and processing strategies students used to guess the meanings of words in context were "form-focused, meaning-focused, evaluating, and monitoring strategies". Successful learners were those that noticed their knowledge gap, looked for context clues to determine the meaning of target words, and constantly checked their inferences. Another study (Eyckmans, Boers and Lindstromberg 2016) employed processing strategies to teach students lexical phrases and concluded that looking for alliterative phrases improved students' ability to learn lexical phrases. Hence, these findings have demonstrated that training students in LLS may improve lexical accuracy and promote writing development.

2.2 Studies on TCF
TCF studies have examined the effect of providing direct feedback (the correct alternative to an error) and indirect (coded) feedback on students' revision of two errors (Bitchener and Knoch 2010; Suzuki, Nassaji and Sato 2019) or several errors (Ferris 2006; Evans, Hartshorn, McCollum and Wolfersberger 2010). These studies came up with mixed findings as successful feedback, whether direct or indirect, depends on several factors, such as proficiency of students, writing assignment, and the error(s) under study (Storch and Wigglesworth 2010).

In the case of lexical errors, research findings may have been inconclusive because teacher feedback studies used different research designs, and some studies placed certain language errors in the same category as lexical errors, leading to different results. Evans et al. (2010) concluded that lexical and syntactic feedback helped students develop their overall language accuracy, but it is not clear whether lexical errors were reduced or not. Similarly, Storch and Wigglesworth (2010) concluded that error type, students' attitudes, and engagement with feedback affect uptake and retention of language. However, that study monitored teacher feedback together with peer interaction, so it is not clear which intervention affected uptake

and retention. Furthermore, lexical errors in Storch and Wigglesworth (2010) included pronouns and articles, which may have influenced the results. Recently, Al-Harbi (2016) carried out a quasi-experimental control group study to examine the effect of TCF on 50 male EFL Saudi students' writing. Results were in favour of the TCF group; however, the study did not analyse students' language errors. Moreover, Al-Hazani and Al-Talhab (2018) investigated the effect of TCF on female EFL Saudi students' grammatical and lexical accuracy. Results showed statistically significant reduction in the TCF group's lexical errors at the immediate and delayed post-tests, but lexical errors in this study included spelling mistakes. On the other hand, few TCF studies reported the results of lexical errors separately. Hartshorn and Evans (2015) examined the effects of giving dynamic (immediate, comprehensive, manageable, and coded) TCF on an experimental group's ability to develop overall linguistic accuracy The study concluded that while dynamic feedback did not affect the writing fluency of the treatment and control groups, it had significant differences on language accuracy but not on lexis. Only one TCF study (Mawlawi Diab 2015) compared the effect of different types of feedback on reducing learners' lexical errors and found that the group receiving direct and indirect feedback made significantly fewer word choice errors at the end of the study than the other groups.

2.3 Studies on PCF
Like TCF studies, several PCF studies found that essay revision in response to peer-feedback had led to language development (Memari Hanjani 2019) and improved audience awareness (Lundstrom and Baker 2009). However, only a couple of studies examined the effect of peer feedback on lexical errors. Mawlawi Diab (2010) compared the effect of self-feedback to peer-feedback on lexis and sentence structure errors. The two groups revised types of language errors in response to peer feedback and self-feedback, respectively. Comparison of the two groups' performance on two revised essays revealed no change in these errors. However, this study did not monitor students' performance on lexical errors alone.

Moreover, Abadikhah and Yasami (2014) examined the lexical errors three groups had made in their writing: group 1 provided peer feedback; group 2 received peer feedback while group 3 engaged in self-feedback. Comparison of the three groups' performance revealed that the groups that gave and received peer feedback significantly reduced their lexical errors at the post-test. However, the study did not examine different types of lexical errors.

2.4 Studies comparing TCF to PCF
Few comparative TCF/ PCF studies examined lexical errors. Mawlawi Diab (2016) compared the performance of three groups who received different types of feedback on short-term and long-term tests and found no significant difference in the performance of the TCF and PCF groups on lexical errors. Moreover, Ruegg (2015) examined the writings of two student groups who received TCF and PCF respectively on all their written assignments over one year. Comparison of the two groups' performance on a pre-test and a post-test revealed that the TCF group

significantly outperformed the PCF group on grammar, but there was no significant difference between them on lexis and overall essay grades.

3. Methodology
3.1 Participants
Thirty-four students participated in the present study and were divided into two groups; one group (n=17) was trained in the use of LLS and received TCF while the second group (n=17) trained in LLS but received PCF. All participants were Lebanese, aged 18-23, whose native language is Arabic. They attended a sophomore EFL course at a university in Lebanon where English is the medium of instruction. The course engaged students in writing paraphrases, summaries, syntheses, responses/critiques. To attend this course, the fourth in a sequence of five communication skills courses, students should have scored 560 on the Student Aptitude Test or passed a pre-requisite freshman level English course. The study took place in two intact sections of this course, where the maximum capacity is 26 students. As participation in the study was voluntary, only 17 out of 26 students in the TCF group and 17 out of 20 students in the PCF group accepted to take part in the study, signed an informed consent form, and submitted all the required assignments.

3.2 Research design and method
To answer the above research questions, the present study utilized the Mixed Methods Design, particularly Sequential Explanatory Design (a) to collect and analyse quantitative data followed by qualitative data (Creswell and Creswell 2003: 209). However, weight was mainly given to the quantitative data since "the initial quantitative results inform the secondary qualitative data collection. Thus, the two forms of data are separate but connected" (Creswell and Creswell 2003: 211). Using SPSS, quantitative data were collected and analysed to examine if there were some statistically significant differences between TCF and PCF groups on reducing students' overall word choice errors in new essays written at immediate and delayed post-tests. Also, quantitative data were collected to explore if there were some statistically significant differences in reducing specific word choice errors, made by TCF and PCF groups on the immediate and delayed post-tests. Next, qualitative data were collected and analysed to investigate students' perceptions of the language learning strategies they used and to explore the difficulties they encountered while revising word choice errors.

To determine their language abilities early in the semester, students in the two groups wrote an argumentative essay (diagnostic pre-test) on the topic "The role of civic education in fostering national unity" as civic education was the topic of the thematic readings for that semester, and it is a popular topic among the Lebanese. Quantitative data involved analysing and comparing the number and type of lexical errors the two student groups had made on a pre-test (before receiving feedback) and on immediate and delayed post-tests (after receiving their respective TCF/PCF). On the other hand, qualitative data involved examining students' reflections on the LLS they had used to revise their lexical errors.

The two groups were taught by two teachers who hold an MA in Teaching English as a Foreign Language (TEFL) and have 9- and 14-years' experience in teaching EFL, respectively. Both groups were trained to apply LLS when revising, in response to their respective feedback, the coded lexical errors they had made on two practice essays. Students' reflection on their lexical error revision followed each of the three writing sessions. After training, the TCF and PCF groups sat for an immediate and a delayed post-test.

All students received four 75-minute training sessions using examples of wrong lexical choices taken from former student papers. Participants classified word choice errors into collocation, connotation, unnecessary, informal, and redundant word errors. To help students understand these lexical errors, teachers defined and provided examples on them as below. Collocation errors are wrong word choices, given the context they appeared in, for example using the expression "*strong* bleeding" instead of '*heavy* bleeding'. On the other hand, connotation errors are words that carry a positive meaning when the intended meaning is clearly negative ('proud' instead of 'arrogant'). Informal word errors are slang words, which are unacceptable in academic writing ('get the hang of' instead of 'learn to'). Furthermore, teachers explained that unnecessary word errors are extra words that do not add new meaning to a sentence ('*In my opinion, I think* that online education is practical") where the two words "in my opinion" and "I think" have the same meaning, while a redundant word error is the repetition of the exact same words in the same sentence (Example: Orientation sessions help *students* learn about their campus and introduce *students* to other new *students*).

Explaining to students the different types of lexical errors with respect to their meaning has three advantages:1. Since lexical errors are not rule-based, teachers need to find another method to explain these errors to students, in this case label them according to the reason that makes these word choices wrong in a given context. 2. Such labelling helps students appreciate the importance of producing clear meaning delivered through formal words that are context-appropriate and free from redundancy and wordiness. 3. It allows teachers to find out which type(s) of lexical errors (informal, collocation, connotation, redundant, unnecessary word errors) students have difficulty in (Hartshorn and Evans 2015), so they focus on them more when teaching.

In addition to explaining and classifying wrong word choices, teachers introduced students to Oxford's (1990) taxonomy of LLS, which categorized these strategies into metacognitive, cognitive, compensation, memory, affective, and social strategies. The teachers modelled for the two groups how to use LLS production systems (see section 1.2) to correct some word choice errors found in former student writing and discussed correct lexical choices with them. Students in the two groups applied the modelled LLS. They read sample essays and looked for word choice errors; considered the projected meanings provided by the written words; and compared them to the intended meanings given the context of the words (metacognitive strategies). Next, they identified each wrong word and labelled it as WW (cognitive strategy) then looked for an alternative term (compensation strategy) with the help of production systems (*IF …THEN*). The teachers hoped that

class discussion of alternative word choices (social strategy) and repeated engagement (affective strategy) in error correction would help students remember the errors they made and the way to correct them (memory strategy).

After the training sessions, one group received TCF, while the other received PCF on the word choice errors they had made on their pre-test. Students in the two groups revised their errors in response to their respective feedback, which involved labelling a wrong word with the code WW. Students followed the same process on a practice summary that they had written in class in week four. Students in the PCF group felt confident about their peers' feedback as they were trained in the correction of lexical errors using production systems (If …Then). However, while students had the same proficiency level, their lexical repertoire was not necessarily the same since this factor depends on students' reading comprehension (Rosado and Caro 2018). In a review of 128 studies, Rosado and Caro (2018) examined the relationship between lexis and reading comprehension. Analysis of the breadth, depth, receptive, and productive lexical knowledge revealed a connection between lexis in EFL, ESL and L1 contexts and reading comprehension.

When revising the lexical errors which the teacher or the peer had coded on two assignments (diagnostic pre-test essay, summary), students were asked to remember the instruction in LLS they had received during the training sessions to help them understand the type of lexical error each WW is and correct it. After each error revision session, students in the two groups anonymously reflected on their experience with revision and their correction of word choice errors. Reflections were a means of finding out the strategies students resorted to while attempting to correct their word choice errors. A set of questions were prepared to guide students' reflections (Appendix). No teacher or peer feedback was given after week four. In week six, students wrote a response essay (immediate post-test) to an article on the topic "civic education", the same theme as their diagnostic essay and summary. Writing the diagnostic essay, summary and response paper on the same theme entailed that student would be familiar with the lexis they needed to use in their immediate and delayed post-tests. Between weeks 6-16, the two groups carried on with regular course writing assignments; in week 16, they read a text on the same theme as that of the pre-test and the response paper then wrote an argumentative essay (delayed post-test).

3.4 Data collection and analysis

The two teachers each labelled all the word choice errors students had made on 14 unmarked, randomly chosen pre-test essays (written before the training sessions) and discussed the errors they found in these essays. Discrepancies in labelling were mostly due to oversight. In a few cases, the two teachers labelled an error differently (for example, one teacher labelled it "informal" while the other labelled it "unnecessary") where both labels were applicable. In such cases, the teachers discussed theses errors and agreed on the more suitable label for each error. After that first error labelling session, the two teachers met twice to label and discuss the errors they found in students' remaining pre-test, immediate and delayed post-tests. The teachers discussed the few discrepancies in the number of lexical errors and

type of error classification until they reached an agreement on all lexical errors made by each student on each of the three tests. After data tabulation, it appeared that only two students had one connotation error each, so connotation errors were eliminated from this study.

4. Results
4.1 Findings of question 1
To answer RQ 1 "Are there any statistically significant differences between teacher and peer feedback groups on reducing students' overall word choice errors in new essays written at immediate and delayed post-tests?", descriptive, Normality, and Mixed Design ANOVA tests were carried out (Tables 1, 2, and 3 below).

Table 1: Descriptive statistics for overall error by group and time

	N	Pre-test		Immediate		Delayed	
		Mean	SD	Mean	SD	Mean	SD
Peer	17	1.1033	0.76746	2.0088	1.51859	0.7426	0.48305
Teacher	17	1.0813	0.95728	1.8914	1.05586	1.4046	0.92867

Comparison of peer versus teacher feedback groups at the pre-test (p-value=0.942) and at the immediate post-test, p-value=0.795) showed no significant difference between the two groups. However, comparison of these two groups' performances at the delayed post-test revealed significant difference, p-value=0.015. Moreover, for the assumption of Normality, the Kolmogorov-Smirnov (KS) test was   conducted (Table 2 below) as it is widely reported (Field, 2009: 562). The KS test is too sensitive and might reject null hypothesis of normality even when the distribution is quite close to it. Based on results from KS test and assessing the distribution, normality could be assumed for overall errors. Figure 1 below includes a boxplot showing the symmetric distribution of data.

Table 2. Test of normality on overall errors

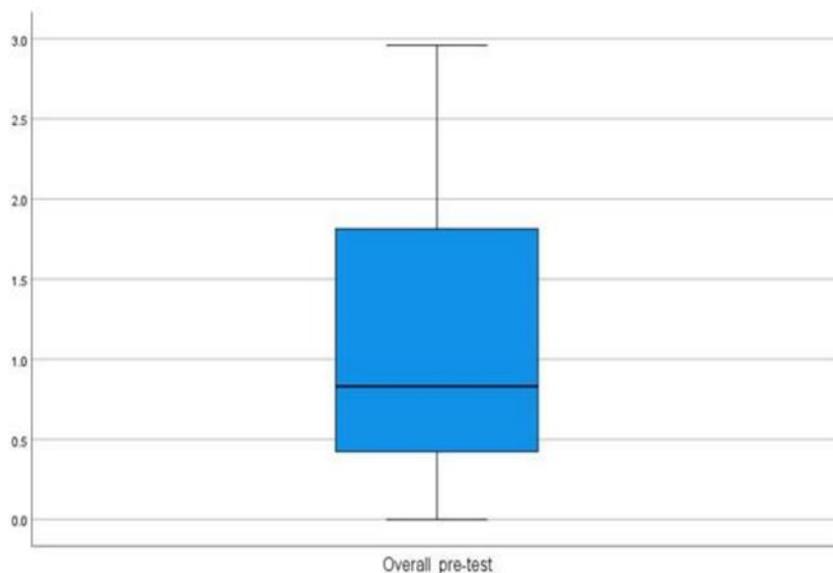|	Kolmogorov-Smirnov		
	Statistic	Df	p-value
Overall pre-test	.151	34	.047
Overall Immediate	.142	34	.079
Overall Delayed	.139	34	.095

Figure 1: Boxplot showing symmetric data distribution

Table 3: Mixed Design ANOVA (between and within subject effect) for overall error type)

Within Subject effect	Type III Sum of Squares	Df	Mean Square	F	p-value
Time	17.05	2	8.525	11.377	<.001
Group by Time^	3.072	2	1.536	2.05	0.137
Error (within subject)	47.957	64	0.749		
Between Subject effect Group	0.258	1	0.258	0.512	0.480
Error (Between Subject)	16.132	32	0.504		

Mauchly's test for sphericity was carried out, $W=0.842$, $df=2$, p-value=0.070. Sphericity could be assumed. Given the significant difference between the two groups at the delayed post-test, a post hoc analysis (SIDAK) was conducted (Table 4 below).

Table 4: Pairwise comparisons using SIDAK correction.

Pair wise testing time main effect	Difference	SE	p-value
Pre-test vs Immediate post-test	-0.858	0.234	0.003

Pre-test vs Delayed post-test	0.019	0.163	0.999
Immediate vs Delayed post-test Pair wise testing Group effect at Immediate and Delayed post-tests	0.877	0.225	0.001
Peer vs teacher at Pre-test	-0.117	0.448	0.795
Peer vs teacher at Immediate post-test	0.662	0.254	0.015

Table 4 above reveals that overall errors are not different between the teacher and peer groups for the first 2 measures (pre-test p-value= 0.942, immediate post-test p-value=0.795). However, there is a statistically significant difference between Teacher and Peer groups at delayed post-test (p-value=0.015) with higher mean of overall error in the teacher group (mean=1.40) than in the peer group (mean=0.74).

4.2 Findings of question 2

In response to research Q2, "Are there any statistically significant differences in reducing specific word choice errors made by TCF and PCF groups on the immediate and delayed post-tests?" descriptive statistics for each type of word choice error made by each of the two groups (TCF and PCF) over the pre-test, immediate, and delayed post-tests were carried out. Table 5 below shows the means and Standard deviations of collocation errors made by each group, at each time point.

Table 5: Descriptive statistics for collocation errors by group and time

		Pre-test		Immediate		Delayed	
	N	Mean	SD	Mean	SD	Mean	SD
Peer	17	0.5808	0.51349	1.2774	1.24826	0.5834	0.41188
Teacher	17	0.7432	0.72767	1.3401	1.02955	0.943	0.78157

Moreover, for the assumption of Normality, the Kolmogorov-Smirnov (K-S) test was conducted (Table 6 below). Based on results from K-S test and assessing the distribution, normality could be assumed for collocation errors.

Table 6. Collocation test of normality

Tests of Normality			
col pre-test	.145	34	.068
col Immediate	.123	34	.200
col Delayed	.161	34	.026

Table 7. Mixed design ANOVA (between and within subject effect) -collocation errors

Within Subject effect	Type III Sum of Squares	Df	Mean Square	F	p-value
Time	8.231	1.606	5.125	7.462	0.003
Group by Time	0.388	1.606	0.242	0.352	0.658
Error (within subject)	35.299	51.395	0.687		
Between Subject effect					
Group	0.323	1	0.323	0.975	0.331
Error (Between Subject)	10.59	32	0.331		

Mauchly's test for sphericity, W=0.755, df=2, p-value=0.013, Sphericity could not be assumed. Greenhouse-Geisser correction for df was used since sphericity could not be assumed. None of the group*time (2 by 2) interactions were significant. Results of the Mixed Design ANOVA (Table 7) include both the repeated ANOVA over time (pre-test, immediate, and delayed post-tests) and the TCF and PCF groups' performance n collocation errors. This Table also provides interaction of Group by time (i.e., the difference between TCF and PCF groups changing over time). The Table shows that the interaction is not significant (p-value=0.658). However, the time effect is significant (p-value=0.003) indicating that the incidence of collocation errors changes over time. Accordingly, a pairwise comparison (SIDAK) was carried out (Table 6). The fact that interaction is not significant means that the difference over Time is true for the peer and teacher groups.

Table 8: Pairwise comparisons using SIDAK correction of collocation error

	Difference	SE	p-value
Pre-test vs Immediate	-0.647	0.200	0.008
Pre-test vs Delayed	-0.101	0.128	0.820
Immediate vs Delayed	0.546	0.203	0.033

This is further supported by the Group effect. Table 8 above explains exactly where the difference is over time. It occurred between the pre-test and immediate

post-test, p-value = 0.008 and between the immediate and delayed post-tests, p-value = 0.033. which is also, not significant (p-value = 0.331).

Table 9: Descriptive statistics for unnecessary word errors by group and time

	Pre-test			Immediate		Delayed	
	N	Mean	SD	Mean	SD	Mean	SD
Peer	17	0.4429	0.5437	0.4907	0.77939	0.1302	0.13303
Teacher	17	0.2554	0.31036	0.3507	0.38764	0.2679	0.3324

Table 9 shows the means and standard deviations of unnecessary word errors made by each group, at each time point. Moreover, the Kolmogorov-Smirnov test was conducted. Assessing the distribution of data revealed that normality could not be assumed for the unnecessary, redundant and informal word errors.

Table 10: Mixed design ANOVA (between and within subject effect) for unnecessary word errors

	Type III Sum of Squares	Df	Mean Square	F	p-value
Within Subject effect Time	0.87	1.669	0.521	2.686	0.086
Group by Time	0.524	1.669	0.314	1.619	0.210
Error (within subject)	10.366	53.409	0.194		
Between Subject effect Group	0.034	1	0.034	0.324	0.573
Error (Between Subject)	3.36	32	0.105		

Greenhouse-Geisser correction for df was used since sphericity could not be assumed. Results of the Mixed Design ANOVA over the three testing sessions and the two student groups' performance on unnecessary word errors indicate that none of the group*time (2 by 2) interactions are significant (Table10). The means and Standard deviations of redundant word errors made by each group, at each time point appear in Table 11.

Table11: Descriptive statistics for redundant word errors by group and time

	Pre-test			Immediate		Delayed	
	N	Mean	SD	Mean	SD	Mean	SD
Peer	17	0.0620	0.16028	0.1383	0.39909	0.0217	0.06517
Teacher	17	0.0547	0.10277	0.1404	0.20418	0.1422	0.19653

Table 12: Mixed design ANOVA (between and within subject effect) for redundant word errors

Within Subject effect	Type III Sum of Squares	Df	Mean Square	F	p-value	
Time	0.118	1.471	0.08	1.293	0.276	
Group by Time	0.086	1.471	0.059	0.944	0.371	
Error (within subject)	2.922	47.072	0.062			
Group (Between Subject effect)	0.013	1	0.013	0.772	0.386	
Error (Between Subject)	0.52	32	0.016			

Mauchly's test for sphericity, W=0.640, df=2, p-value=0.001, Sphericity could not be assumed. Greenhouse-Geisser correction for df was used since sphericity could not be assumed. The results of Mixed Design ANOVA over the three testing sessions and groups' (peer and teacher) performance on redundant word errors (Table 12) reveal that none of the group*time (2 by 2) interactions are significant.

Table 13: Descriptive statistics for informal word errors by group and time

		Pre-test		Immediate		Delayed	
	N	Mean	SD	Mean	SD	Mean	SD
Peer	17	0.0018	0.00742	0.1023	0.4218	0.0072	0.02972
Teacher	17	0.0280	0.08002	0.0602	0.18467	0.0515	0.08839

Table 14: Mixed design ANOVA (between and within subject effect) for informal word errors

Within Subject effect		Type III Sum of Squares	Df	Mean Square	F	p-value
Time		0.083	1.09	0.076	1.128	0.301
Group by Time		0.035	1.09	0.032	0.481	0.508
Error (within subject)		2.349	34.878	0.067		

Group (Between Subject effect)		0.001	1	0.001	0.057	0.813
Error (Between Subject)		0.429	32	0.013		

Table 13 shows the means and Standard deviations of informal word errors made by each group, at each time point. Mauchly's test for sphericity, W=0.165, df=2, p-value=<0.001, Sphericity could not be assumed. Greenhouse-Geisser correction for df was used since sphericity could not be assumed. The results of Mixed Design ANOVA over time (pre-test, immediate, and delayed post-tests) and groups' (peer and teacher) performance on informal word errors (Table 14) show that none of the group*time (2 by 2) interactions are significant.

4.3 Findings of question 3

To answer Q3 (What are students' perceptions of the language learning strategies they use and the difficulties they encounter while revising word choice errors?), only reflections of the PCF group were considered in this study as this group was the one to significantly reduce overall word choice errors. Two sets of anonymous reflections written by the PCF group about their experience with feedback and error revision were examined. However, only the second set of reflections is discussed below as in that reflection, PCF students were better able to describe their processes of error revision and correction.

Analysis of these reflections revealed that with respect to strategy use, 5 out of 17 students depended on memory of instruction regarding revision and correction of lexical error types, 15 out of 17 depended on gut feeling, and 11 out of 17 referred to previous experience with lexical choices.

Regarding restructuring, 13 out of 17 students stated that they restructured sentences to avoid correcting lexical errors which peers had spotted and student writers could not correct. Five of these 13 students restructured sentences because they "do not know the correct word to use" and four students did so to "avoid mistakes". Moreover, 2 out of 17 students considered restructuring a sentence "easier than correcting a wrong word" and 1 out of 17 restructured a sentence to "clarify an idea". Another student (1 out of 17) considered restructuring "depending on whether the idea will be clearer if the sentence is restructured or if only the wrong word is corrected".

Finally, responses to the lexical category which students found difficult to correct were as follows: collocation (13 out of 17), informal word errors (6 out of 17), unnecessary word errors (5 out of 17), and redundant word errors (4 out of 17).

5. Discussion

There was a significant difference in the performance of the TCF and PCF groups as the PCF group significantly reduced their overall word choice errors at the

delayed post-test unlike the TCF group. This result disproved the first hypothesis of this study which stated that the group receiving TCF and LLS training would reduce more lexical errors than its counterpart. The above result may be due to the nature of feedback each group received. The TCF group that received WW (wrong word) as coded feedback had no way of ascertaining what type of word choice error a certain coded word was (collocation, unnecessary, redundant, or informal) since teachers had coded student errors in their offices but had not discussed these errors with the students. Neuroscience research has emphasized the importance of giving meaningful instruction as meaningfulness is the main factor that determines what the brain encodes in long-term memory (Devlin 2010 in Hartshorn and Evans 2015). This may explain why during training, students in the PCF group, who could interact with their peers to understand what their wrong words (WW) were and how to correct them using LLS, had significantly fewer lexical errors at the delayed post-test. The collaborative negotiation between editor and writer seemed to have helped writers understand their errors, thus increasing their ability to make correct word choices. This result agrees with that of Huisman et al. (2018) and Xiao and Lucking (2008) who found that students who received qualitative and quantitative feedback developed their writing better than those who only received quantitative feedback (grading). The finding of this study also corroborates the result of Mawlawi Diab (2015) who concluded that the method of giving feedback plays an important role in language development. Moreover, this finding aligns with that of Khreisat and Mugableh (2021) whose participants attributed 25% of L2 writing effectiveness to activities requiring collaboration between teachers and students, which highlights the importance students allot to participation in their own learning.

Another reason for the PCF groups' significant reduction of overall word choice errors at the delayed post-test is the role of students' writing practice, (between weeks 6-16) in reducing lexical errors. The course writing assignments may have provided students with opportunities to apply metacognitive strategies where they revised, evaluated, and edited their writing thus "avoiding repeating words, choosing suitable words, writing words correctly" (Cer 2019: 17).

On the other hand, results of Q2 revealed that the PCF group reduced unnecessary and redundant word errors at the delayed post-test (Tables 9 and 11). The PCF group's repeated attention to lexis may have turned their declarative knowledge about lexical errors into procedural knowledge using LLS production systems (Anderson 1985, section 1.4). Hence, when writing the delayed post-test, the PCF group seems to have noticed some of their unnecessary and redundant words and deleted them because of applying the following LLS production system: "*IF* a sentence includes an unnecessary word, *THEN* delete it" and "*IF* a sentence includes a redundant word, *THEN* delete it". Students' increased awareness of unnecessary and redundant word errors after the 10-week writing practice of LLS seems to have helped them reduce wordiness and repetition. In contrast, the TCF group increased all types of lexical errors at the delayed post-test.

As for collocation errors, a comparison of the PCF group's performance on the pre-test and the delayed post-test reveals that the PCF group almost maintained the same percentage of collocation errors at the delayed post-test (see Table 5)

despite the above-mentioned writing practice. This result confirms the second hypothesis which considered collocation errors hard to reduce and corroborates the findings of Hartshorn and Evans (2015). This same result also agrees with students' reflection responses regarding the difficulty of collocation errors (Q3). Moreover, applying the following LLS ("*IF* a sentence includes a collocation error, *THEN* replace it with a synonym*"* cannot provide students with a synonym to correct the wrong collocation. As a result, most PCF students opted to restructure their sentences to avoid collocation errors as 13 out of 17 students in the PCF group indicated in their reflection papers (Q3). The same explanation may apply to informal words when students do not know formal words to replace them. Hence, training students in the use of LLS to revise lexical errors yields positive results (Hu and Nassaji 2014) but only with certain lexical errors and after sufficient practice (Ferris 2006; Storch and Wigglesworth 2010).

6. Conclusion and implications

This study has shown that the group that used LLS to address PCF resulted in significant reduction of overall lexical errors at the delayed post-test. The interaction that took place between student writers and their peer editors, in addition to the meaningful PCF, fostered students' understanding of their lexical errors. However, the PCF group's significant reduction of their overall lexical errors appeared only at the delayed post-test, which demonstrates the importance of repeated writing practice (weeks 6-16) in learning (Anderson 1985). Another finding is that the use of LLS helped the PCF group reduce their unnecessary and redundant word errors at the delayed post-test, though not significantly. The fact that LLS did not reduce collocation and informal word errors reveals that type of error plays a role in error correction, a finding corroborated by Storch and Wigglesworth (2010), and Van Beuningen et al. (2012). Finally, where students could not think of correct lexis words to use, they resorted to restructuring to avoid errors.

This study contributed to research on lexical errors in several ways. 1. It revealed the benefit of teaching students to apply LLS when revising lexical errors in response to PCF. 2. It corroborated the finding of Devlin (2010) regarding the importance of giving meaningful feedback on lexical errors. 3. It classified lexical errors, which are not rule-based, into several types to help students determine which word choice errors they need to work hard on and control. 4. It confirmed the efficacy of PCF by demonstrating that teachers can train and rely on peers to review and correct their colleagues' word choice errors, a finding confirmed by Abadikhah and Yasami (2014).

The present study has pedagogical implications. Since the use of LLS and coded feedback to raise students' awareness of wrong lexis reduced only certain types of lexical errors, it is recommended that teachers draw students' attention to vocabulary in context. This may be achieved through the use of thematic readings discussed in class (Ahmad and Othman 2019) in order to help students, enrich their lexical repertoire. Moreover, given that the study findings have demonstrated the usefulness of meaningful feedback that clearly states the type of lexical errors,

teachers are advised to code these errors as 'col' for collocation errors, 'unn' for unnecessary word errors, 'red' for redundant word errors, and 'inf' for informal word errors. This measure would help students understand their errors, which is the first step towards correcting them.

However, the study has two limitations. First, it included a relatively small student sample. Second, it did not include a student questionnaire. It would be interesting for future researchers to repeat the present study using a larger student sample of different proficiency levels. It is also recommended to survey students to learn about their backgrounds and learning styles, which would shed light on individual factors affecting students' lexical engagement in corrective feedback (Han and Hyland 2015). Moreover, researchers are encouraged to use think aloud protocols to understand the processing strategies that students use, rather than depend on their perceptions of these strategies. Finally, this study did not include grading peers' feedback to determine its accuracy, so in future studies, researchers are advised to grade peer feedback.

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Appendix
Self-Reflection
Instructions: Kindly reflect on the process of error revision and correction you engaged in by addressing the below questions.

1. What strategies do you apply when correcting a word choice error (memory of the strategies taught in class, gut feeling, previous experience with that error, etc.)?
2. Do you restructure a sentence to avoid correcting an error edited by your peer? If yes, explain the reason(s) for your behaviour?
3. Which category/ies of word choice errors do you consider difficult to correct (informal, collocation, redundant, unnecessary)? Why?