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# THE EFFECT OF WRITTEN CORRECTIVE FEEDBACK STRATEGIES ON COLLOCATION ERRORS OF LOW-PERFORMING ESL LEARNERS

by

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**Abstract:**

*The studies on error correction have been laying their emphasis on grammatical structures of the language with lack of focus on non-grammatical aspect such as lexical collocation. Therefore, this study aims at investigating the effect of direct and indirect written corrective feedback on low-performing ESL learners. Ninety-two students of a public university involved in the study. Three intact groups that have equal proficiency were identified at the beginning of the university's academic term. A quasi-experimental design was employed with two experimental groups receiving indirect WCF and direct WCF separately, and a control group deprived of any treatment. The groups were measured in three different time points with pre-test before the intervention, immediate post-test after the intervention, and delayed post-test to measure retention effect. One-way ANOVA and repeated-measures ANOVA were used to measure the effect. The findings reveal that significant differences were detected in immediate post-tests of direct and indirect WCF groups which indicate that both WCF strategies can enhance participants' collocational competency. Additionally, the findings also show that direct WCF strategy greatly affects participants collocation errors despite both groups performed better than the control group. This study demonstrates that retention effect was detected in the group that received direct WCF while the indirect WCF group was not able to retain - in delayed post-test. Recommendation is also discussed for Future directions of studies.*

***Keywords:*** *written corrective feedback, direct WCF, indirect WCF, English collocation, low-performing ESL learners.*

## INTRODUCTION

In the field of second language acquisition (SLA), two central questions of the role of Written corrective feedback (WCF) arises: should WCF be provided on learners linguistic errors in

writing; and how WCF is supposed to be provided have garnered considerable empirical and theoretical attention. The question whether WCF improves English as Second Language (ESL) learners' writing accuracy has been argued over the past two decades from a theoretical perspective that began from the argument started by Truscott (1996).

He argued that WCF has a harmful effect on learners' grammatical accuracy in L2 writing after reviewing several past empirical studies and clarified further that teachers should abandoned it. However, other scholars have refuted Truscott's claim by arguing that WCF can promote ESL learners writing accuracy (Ferris, 1999; Chandler, 2003; Ferris, 2004; Ellis, Sheen, Murakami, & Takashima, 2008: Bitchener, 2008) but they also insisted that more empirical evidence is essential before one can declare to abandon error correction in language learning. An extensive body of empirical studies have been expanding in the literature investigating the efficacy of WCF and the magnitude to which it aids in improving grammatical accuracy of L2 learners which stemmed from the debate (Kang & Han, 2015; Nassaji & Kartchava, 2017).

Flaws were found in many early WCF studies, as seen from language acquisition perspectives in which the researchers did not investigate WCF's effect on new pieces of text writing. Furthermore, early studies were focused on investigating the role of corrective feedback (CF) in assisting learners achieving better accuracy in second drafts of writing (Ferris & Roberts, 2001). In addition, more studies have been performed to investigate the effectiveness of WCF in developing learners' accuracy in L2 development that followed research designs like the ones used in investigating various forms of oral corrective feedback (CF). A consistent evidence provided by these recent studies (Sheen, 2007, 2010; Bitchener, 2008; Ellis et al., 2008; Sheen, Wright, & Moldawa, 2009; Bitchener & Knoch, 2009a, 2009b; Van Beuningen, de Jong, & Kuiken, 2012; Shintani, Ellis, & Suzuki, 2014; Stefanou & Revesz, 2015; Karim & Nassaji 2018 ; Westmacott, 2017; Banaruee, Khatin-Zadeh, Ruegg, 2018) revealed that CF has performed a significant role in assisting learners to acquire grammatical features thus improving their linguistic proficiency in the target structure of the language.

This has presented a challenge on Truscott's (1996) arguments who disagree with error correction for being undesirable and ineffective in second language development. However, the literature has also shown, based on empirical findings that there is indeed a significant role for CF in L2 writing classes as agreed by most L2 scholars (Benson & DeKeyser, 2019). Thus, the linguistic features, target features, amount of feedback, and type of feedback to be offered to learners remain as unresolved issues despite an abundance of studies focusing on the role of WCF in the literature. Suzuki, Nassaji, and Sato (2019) argued that while these studies have shown that WCF is useful in general despite some studies indicated opposite findings, they have also demonstrated that the effect of WCF is mediated by other aspects such as the type of feedback (direct, indirect, metalinguistic, focused, and unfocused), timing of test (immediate vs. delayed), target structure (verb, noun, article), and type of outcome measure (new writing vs. revision). Several studies have examined the effect of WCF by framing these variables separately: types of target structures (Hashemnezhad & Mohammadnejad, 2012; Bitchener, Young, & Cameron, 2005); types of feedback (van Beuningen et al., 2012), explicitness of feedback (Suzuki et al., 2019; Karim & Nassaji, 2015); type of measure (Truscott & Hsu, 2008; Shintani & Ellis, 2013).

Several studies have also investigated the effects of CF's explicitness, that is direct and indirect dichotomy, on various target structures of the language. These target structures are grouped into two main areas of grammatical and non-grammatical structures. There are several studies that examined the effect of indirect and direct WCF on grammatical structures (Ruegg, 2015; Van Beuningen et al., 2012; Tan & Manochphinyo, 2017; Nusrat, Ashraf & Narcy-

Combes, 2019; Suzuki et al., 2019; Cerezo, Manchon & Nicolas-Conesa, 2019) that are focusing on English article systems. On the other hand, other scholars have also investigated the effect of direct and indirect WCF on English verb system (Jamalinesari, Rahimi, Gowhary & Azizifar, 2015; Eslami, 2014; Han, 2012). Whereas, several researchers (Hashemnezhad & Mohammadnejad, 2012; Ruegg, 2015; Tan & Manochphinyo, 2017; Nusrat et al., 2019) have studied the effect of direct and indirect WCF on English preposition.

Non-grammatical structures of the language have also gained the attention of SLA scholars. Several studies were conducted to investigate the effect of direct and indirect WCF on non-grammatical structures such as vocabulary (Ghandi & Maghsoudi, 2014; Septiana, Sulistyo & Kadarisman, 2016; Banaruee et al., 2018; Cerezo et al., 2019), punctuation (Karim & Nassiji, 2018), sentence structures (Cerezo et al., 2019), spelling errors (Karim & Nassaji, 2018; Ghandi & Maghsoudi, 2014), and word choice (Ruegg, 2015; Karim & Nassaji, 2018; Van Beuningen et al., 2012).

The results of this study are explained through the framework of Skill Acquisition Theory (SAT) (DeKeyser, 2007). The theory considers language acquisition as a detailed occasion of acquiring a specific skill. For instance, in the course of acquiring a new skill such as learning to play a particular sport. The acquisition process starts when knowledge (declarative knowledge) about the specific skill to play the sport is informed to the learner. Then, the learner needs to apply the declarative knowledge via constant practice in order to build procedural knowledge of the specifically intended skill. The skill is developed over time as practice continues, and the more he involves himself in a series of consistent drills, the better he can become at the specifically targeted skill. In the long run, procedural knowledge becomes internalized to the extent that it is now unconscious and automatic. In the real world, this pattern developmental of progressive skill learning occurs among skilled laborers, musicians, athletes, and as according to scholars supporting SAT, the L2 learners themselves.

It is possible, under the framework of SAT, to investigate the effectiveness or ineffectiveness of WCF. The theory maintains that WCF is beneficial when it contributes adequately to learners' declarative knowledge of the targeted language structures. The referred declarative knowledge in this case is known as a conscious understanding of how grammar works in a language system. This practice functions as a connector between the declarative knowledge communicated by WCF and procedural knowledge of the identical structures. The procedural knowledge explains here refers to a learner's capacity in using the target structures correctly in authentic production of language, for instance, in writing composition.

In this study the notion of "proceduralization" is operationalized by noting accuracy changes in the groups that received intervention details when comparison was made with the accuracy changes of control group. The plausibility of declarative knowledge transition to proceduralized knowledge can be explained through changes in accuracy in the writing modality. Furthermore, this transition was demonstrated when the experimental participants outperformed control participants in accuracy over time. The learners' errors were significantly reduced on construction even though they were uninformed that their accuracy changes were being analyzed and examined.

**Written corrective feedback and its inconclusiveness**

Early studies of corrective feedback provision to investigate its efficacy in improving L2 learners' writing accuracy through error correction have been unsuccessful in highlighting significant differences between the intervention and control groups. The arguments are further

clarified by Truscott (1996) who argued that CF was significantly unsuccessful to help developing writing accuracy of L2 learners. His rebuttal view against the effectiveness of CF was shaped by Krashen's (1981) Monitor Model theory which indicate that grammar teaching focuses on certain structures was only beneficial if students are at the proper developmental phase to develop the intended structure. However, several researchers indicate that WCF indeed have positively affected L2 learners' language accuracy (Chandler, 2003; Ferris, 2004; Ferris, Chaney, Komura, Roberts, & McKee, 2000). Criticism on early WCF studies have emerged regarding the methodological flaws surrounding the studies (Wang & Jiang, 2015). Therefore, researchers in current WCF studies (Sheen, Wright, & Moldawa, 2009; Ellis, Sheen, Murakami, & Takashima, 2008; Bitchener, 2008; Bitchener, Young, & Cameron, 2005) improved their study designs to the extent that more positive results were generated from their findings. These studies mainly investigating the effect on English grammatical systems, and their study design was quasi-experimental with the inclusion of control groups for comparison purposes.

In contrast with the constructive results of WCF studies, Truscott, and Hsu (2008) claim that participants who were L2 learners in their study failed to show significant improvement of accuracy in writing. Additionally, accuracy improvement over time did not show promising results compared to others mentioned above. Regardless of inconclusiveness of WCF efficacy, it is still used in varying forms and degrees in formal L2 classroom teaching and learning (Tan & Manochphinyo, 2017).

One of the emerging developments in studies investigating the effectiveness of WCF strategies is the direct-indirect dichotomy categorised by the explicitness of WCF when it is applied on L2 learners' writing. Ferris (2009) describes that indirect WCF is indicated by a teacher in various to indicate that error has been produced, but without detailed explanation or correction of the error. The indication of an error is usually made by any means of underlining, circling, or a universally accepted *'X'* symbol to indicate a presence of incorrect form. On the other hand, direct WCF usually includes more effort by a teacher in terms of crossing or underlining unwarranted words, inserting misplaced words, and writing metalinguistic information regarding targeted grammatical rules or structures. These three elements of indirect WCF are given as a form of error treatments on L2 learners' writing which is more in depth and supplied with more linguistic information than the indirect WCF. Therefore, a critical problem occurs concerning the types of WCF strategies that largely affect L2 learners' accuracy in writing. A great deal of studies has been conducted over the years with inconsistencies in their findings. Ferris (2010) argue that discrepancies in linguistic focus could become the contributing factor that has contributed to conflicting findings of researchers who have studied the effect of WCF on writing accuracy of L2 learners. Therefore, the firm conclusion on the merits between direct and indirect WCF has not been established thus far.

## The written corrective feedback on direct-indirect dichotomy

Various studies investigate the effect of WCF on learners writing accuracy conducted over the span of several decades have produced inconsistent findings. Without exception, current studies by Ruegg (2015), Jamalinesari et al. (2015), Westmacott (2017), Tan and Manochphinyo (2017), Banaruee et al. (2018), Karim and Nassaji (2018), Nusrat et al. (2019), Suzuki et al. (2019), and Cerezo et al. (2019) despite their properly designed methodology and were focusing on specific language systems at a time, have also presented inconsistencies of findings. Ruegg (2015) conducted a study with forty-one Japanese university EFL learners to

examine the efficacy of direct and indirect WCF on lexical and grammatical problems. The study found that indirect WCF is efficient for lexical problems and errors related to essay structures whereas direct WCF is effective for errors related to surface-level grammar. In support of the effectiveness of indirect WCF, Jamalinesari et al. (2015) revealed that the intervention group that received indirect WCF treatment showed better improvement than the group that was provided with direct WCF treatment. The findings were discovered from a series of test on investigating WCF's effect on students' grammatical knowledge of singular-plural and regular-irregular verb forms. Westmacott (2017) argue that indirect WCF is more useful in improving students' proficiency in her study because it triggers greater cognitive learning and processing. Furthermore, the study also reveals that indirect WCF also facilitate to strengthen grammatical knowledge and promote independent learning behavior.

Direct corrective feedback (CF) is seen as advantageous because it offers students with unambiguous instructions concerning error corrections (Ferris and Roberts, 2001). Furthermore, direct CF is desirable with learners who are deprived of the correct forms of the errors, for instance, learners of low levels of proficiency. Tan and Manochphinyo (2017) showed that both types of WCF were not able to help the students in their study in improving accuracy of grammatical elements in writing when the participants were tested immediate post-test. However, a significant long-term development was observed in delayed post-test results of the group that was given indirect WCF treatments. In an opposite finding, Banaruee et al. (2018) reported that both groups of EFL learners in their study showed significant writing improvement. However, a significant difference was observed in post-test scores of experimental and control groups in which the group that was provided with indirect WCF showed better performance than the comparison group. Similarly, all WCF strategies applied in a study by Suzuki et al. (2019) positively affect students' writing accuracy. Eighty-eight adult Japanese EFL learners were tested with pre-test, immediate post-test, and delayed post-test instruments to investigate their accuracy of past perfect verb and indefinite article in writing. The study had specifically revealed that the group received indirect WCF treatment produced higher accuracy in both post-tests scores.

While indirect WCF is observed as producing more successful results in treating errors related to lexical problems, the direct WCF strategies are presumably more effective in treating surface-level grammatical errors. Ruegg (2015) argued that direct correction is best provided on discrete grammatical problems such as incorrect prepositions, articles, and verb forms. This is in line with Chandler (2003) that direct CF is indeed more successful in treating students' errors in writing. The provision of direct WCF is also supported by Karim and Nassaji (2018). In their study with fifty-three ESL learners of intermediate proficiency, the participants were tested in a series of tests to examine their errors on grammatical and non-grammatical structures. The findings revealed that all groups that were provided with CF outperformed the control group which indicates that the provision of CF is effective, regardless of its forms. However, one important facet of the findings is that short-term accuracy improvement was significantly higher in the direct WCF group. Similarly, Nusrat et al. (2019) performed a study on ninety ESL students to examine the effectiveness of WCF on students' accuracy of English article structures, prepositions, and past tense verb in writing. Fewer errors were reported with the students that received direct WCF in two out of the three linguistic forms being tested which indicate that direct WCF was able to enhance their accuracy in the targeted language systems. The efficiency of direct WCF over indirect WCF was also reported by Cerezo et al. (2019). Specifically, they argue that direct WCF is more helpful than indirect WCF, in the context of

short-term and long-term effect of WCF on grammar as observed in immediate and delayed post-test.

**Empirical evidence of the effect of written corrective feedback in English collocation**

Properly designed studies investigating the effect of WCF are focusing more in English grammatical system despite a small number of studies investigating non-grammatical system such as Van Beuningen et al. (2012) and Ghandi and Maghsoudi (2014). One of the non-grammatical aspects of the language that rarely attract researchers' attention is English collocation, that refers to the meaning relation between lexical items in a sentence or text. There are several studies in the literature (Wolter & Gyllstad, 2011; Yamashita & Jiang, 2010; Szudarski & Conklin, 2014: Szudarski, 2017: Ding & Reynolds, 2019) that highlight difficulties of ESL and EFL learners in arranging or putting words to from collocation as natural as native speakers. Studies mentioned above indicate that L2 learners regularly produce inaccurate collocations in their attempt to achieve competency in L2 writing and production. The tendency to make collocation errors is caused by the nature of language that has a natural order in which words are related or arranged to one another in a sentence. Furthermore, the words that co-occur naturally appear automatically in one's mind, if the co-occurrence of the words exist in collocation constructions. However, such naturally co-occurring words become an error in writing if they are paired inappropriately. A study focusing on the effect of WCF strategies on collocation competence is crucial for it offers understanding of assisting L2 learners to achieve better writing accuracy through accurate collocation productions. Furthermore, studies focusing on various aspects of English collocation is very few in the context of education in Malaysia. Among the limited studies, Ang and Tan (2016) indicate the existence of glaring distinction of British and Malaysian learners text production analysed through a corpus of text. Their study highlights prevalent errors in Malaysian L2 learners of collocation constructions in writing which was compared with their British counterparts who were free from collocation errors. The collocation errors produced by Malaysian students in writing, according to Hong, Rahim, Hua and Salehuddin (2011) were caused by intralingual transfer between learners' L1 and L2. These findings show that collocation difficulties exist in text production of Malaysian ESL learners.

The effects of direct and indirect WCF in the studies mentioned above are inconsistent. Moreover, a dearth of empirical evidence exists in the literature about the effect of direct and indirect WCF on collocation accuracy in writing which is worth an investigation. It is noteworthy that a huge sum of the studies that emphasize on investigating the effects of WCF in the literature were performed with intermediate proficiency learners that indicates low-performing L2 learners are under investigated in the context of WCF's effectiveness (Liu & Brown, 2015). This trend is also prevalent in the studies mentioned above that almost all the participants in said studies are of intermediate proficiency level. Therefore, the primary objective of this study is to investigate the effect of direct and indirect WCF strategies on collocation errors produced by low-performing ESL learners. The following research questions (RQ) were formulated to frame the study:

RQ 1: What are the effects of direct and indirect WCF strategies on collocation errors of low-performing ESL learners' scores in immediate post-tests?

Since the research question is generally enquiring on the effect of WCF on all groups, two hypotheses were formulated because two distinct groups received different treatments and

one control group in the study.

H01: There is no statistically significant difference of scores in immediate post-test of the group that received Indirect WCF treatment.

H02: There is no statistically significant difference of scores in immediate post-test of the group that received Direct WCF treatment.

RQ 2: Does significant difference exist between indirect WCF strategy and direct WCF strategy in reducing collocation errors of Low-performing ESL learners?

H03: Significant difference does not exist between the effect of Direct WCF strategy and Indirect WCF strategy in reducing collocation errors of low-performing errors of ESL learners.

RQ 3: What are the effects of direct and indirect WCF strategies on collocation errors of low-performing ESL learners' scores over time?

This study employs different groups with different treatments. Therefore, two hypotheses were formulated to answer research question number three.

H04: The measured effect of direct WCF strategy is not maintained over time.

H05: The measured effect of indirect WCF strategy is not maintained over time.

## METHOD

### *Design*

This study employed a quasi-experimental design consisted of two groups that received intervention method and a control group deprived of the intervention. There are various designs under the provision of quasi-experimental, to be specific, the pre-test-post-test non-equivalent groups design was selected as the main design of the study. Early studies on corrective feedback were criticised due to methodological flaw with the absence of control groups (Chen, Lin & Jiang, 2016). Thus, based on criticism of early studies, a control group deprived of WCF strategies was included in the study. Furthermore, the selection for a quasi-experimental design was due to the context that randomization of the participants into the experimental and control groups was impossible.

### *Participant*

Ninety-two low-performing ESL students of a public university in Sarawak, Malaysia participated in the study. Low-performing ESL students, which is also known as students with elementary level of English proficiency were the focus of this study. All students who were in the second year of their study, were selected from the Faculty of Information Management of the public university following a screening process to find potential groups of participants. The university has numerous academic programs listed under 10 various faculties. It was decided that the students registered under the Faculty of Information Management positioned at the bottom of the list after a series of screening through their previous semester English course

results, thus qualified them to be selected as the focus group of the study. The university's policy prohibited random assignment of the participants for the study but allowed for the researcher to select intact groups. Therefore, the control group and intervention groups were chosen from several available groups of students from the Faculty of Information Management at the beginning of September 2019 academic semester. The procedure of selecting the three groups was done by comparing the mean scores of previous semester English course of all seven groups. Next, three groups that showed almost equal mean scores of English tests were then identified and chosen. After the process of screening and selection for the groups, the details of every group is explained in the following: the direct WCF group contained thirty students and labelled as DWCF; the indirect WCF group has thirty-two students and labeled as IWCF; the control group consisted of thirty students deprived of any treatment.

### *Instrument*

There are very few tests that are reliable and valid in measuring collocation competency of ESL learners and one of them is COLLEX and COLLMATCH tests constructed by Gyllstad (2009). The tests were designed through a laborious process of following theoretically defined validity and reliability constructs and administering the tests to a group of 300 ESL learners (see Gyllstad, 2009 for a thorough descriptions of test developments and the process involved). The COLLMATCH test was adopted in the context of this study, to investigate the possible different effects of WCF strategies on collocation errors produced by the students in this study. A pilot test was performed before the commission of the actual study with thirty low-performing students to examine the item-facility index of the COLLMATCH instruments (see Carlson and von Davier, 2017 for item-facility index in Item Response Theory). The items in the pilot test instruments that indicated high facility index were excluded as they were too easy for the revised instruments later. Additionally, difficult items in the pilot test were also excluded in the revised test as they were identified with low facility index. At this point, the revised COLLMATCH for the current study contains forty words that were possible to be paired for correct collocations. Each correct collocation made in the test was awarded one mark over a total of twenty marks. Specifically, there were twenty correct collocations in the revised test. The same revised COLLMATCH test was distributed to the three groups over a period of fourteen weeks: pre-test served as the baseline data; immediate post-test as the tool to measure changes; and delayed post-test as the tool to investigate retention effect.

### *Data Collecting Procedures*

The data collection procedures were performed during the academic semester of September 2019 until December 2019 that lasted for fourteen weeks. At the beginning of the academic semester, that is week-one and week-two, the researcher conducted several discussions and revision sessions on English collocation topics with the groups. Leading to the distribution of pre-test instruments, all participants in the study had the opportunity to study on the subject matter with the researcher for eight hours over a period of two weeks. The participants at this stage were not told that they were involved in a study that required them to

go through several tests. They were made uninformed to reduce the Hawthorne Effect. It is one of the drawbacks in experimental study design in which participants' behaviors are subject to change providing that they know their involvement in a research (McCarney, Warner, Iliffe, Van Haselen, Griffin & Fisher, 2007).

In the following week, pre-test instruments were administered to experimental and control groups. After the session of answering pre-test instruments ended, they were collected for evaluation and scores were also recorded. Intervention begins at this stage in which the IWCF group received indirect WCF treatment by means of marking a symbol 'X' on errors made on inaccurate collocation. No further clues or descriptions about the errors were supplied and they had to rely on individual initiative to work on the errors once they received the returned pre-tests. The DWCF group was given direct WCF treatment by writing the correct collocation next to the incorrect ones. Additionally, examples of sentences were also written that showed correct collocation used in a sentence. The examples of sentences were only written on the incorrect collocations produced in their pre-tests. Furthermore, no sentences were written if they managed to identify correct collocations. The control group was deprived of any WCF strategies and their tests were all collected, scores were recorded but no tests instruments were returned to them.

The experimental groups received their pre-tests instruments that had been evaluated, in the following week. The students were given thirty minutes upon receiving their pre-test instruments, to study the errors supplied with respective WCF strategies. However, the pre-test instruments for control group were not returned and they were administered with another set of immediate post-test instruments. Both experimental groups were administered with another set of immediate post-tests after the 30-minute session of studying the errors ended. Immediate post-tests of all groups were collected at the end of the session and evaluated with scores recorded afterwards.

The administration of delayed post-test instruments was performed exactly ten weeks later. The rationale of including delayed post-test was to investigate the retaining effect of WCF strategies. This is in line with Bitchener (2008) that the retention effect of CF strategies is measured through the inclusion of delayed post-test in data collection stages. Moreover, to eliminate the maturation effect, the participants were not informed of the administration of delayed post-test at a later stage of the study. This is also a strategy to eliminate the possibility of students memorizing the intervention details in immediate post-test.

***Target structures***

The target linguistic structure of this study is the lexical collocations that refers to the association concerning two or more words that naturally occur in a sentence with reference made to Hill (2000) and Lewis (2000). Out of all word classes or parts of speech in English, there are only four that can be combined to form collocations: adjectives; adverbs; noun; and verb. Several researchers (Hsu, 2010; Ridha & Al-Riyahi, 2011) claim that some subtypes of collocation can be formed naturally from the four word classes mentioned above: (1) Noun + verb, such as *car crashes* and *ice melts*; (2) Verb + noun/P or prepositional phrase for example,

*set the table*, and *break a record*; (3) Adjective + noun, for example *best friend* and *strong opposition*; (4) Noun + of + noun, for example *a surge of anger*; (5) Adverb + adjectives, such as *deeply offended*; (6) Verb + adverb, for example *badly damaged*.

However, this study focuses to investigate only two subtypes of collocations: (1) verb-adverb collocation; (2) noun-verb collocation.

## RESULT AND DISCUSSION

### *Result*

A one-way ANOVA was computed in Statistical Package for the Social Sciences (SPSS) to determine the homogeneity of groups variances. This is the first step to ensure the homogeneity of the participants at the start of the study prior to receiving the interventions. Table 1 displays the descriptive data of every group involved in the study.

**Table 1. Descriptive Data of Pre-test**

| | | | | | 95% Confidence Interval for Mean | | | |
|---|---|---|---|---|---|---|---|---|
| | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Minimum | Maximum |
| IWCF | 32 | 17.2813 | 5.06241 | .89492 | 15.4561 | 19.1064 | 8.00 | 30.00 |
| DWCF | 30 | 17.4333 | 4.97361 | .90805 | 15.5762 | 19.2905 | 10.00 | 30.00 |
| NOWCF | 30 | 17.3667 | 6.00278 | 1.09595 | 15.1252 | 19.6081 | 8.00 | 30.00 |
| Total | 92 | 17.3587 | 5.30101 | .55267 | 16.2609 | 18.4565 | 8.00 | 30.00 |

**Table 2. Test of Homogeneity of Variances of Pre-test**

| Levene Statistic | df1 | df2 | Sig. |
|---|---|---|---|
| 1.392 | 2 | 89 | .254 |

As presented in table 2, the pre-test scores have met the assumption of homogeneity of variances which indicates that the variances are equal across all groups ($p > 0.05$). This is the assumption that must be achieved before further ANOVA analyses is performed.

RQ 1: What are the effects of direct and indirect WCF strategies on collocation errors of low-performing ESL learners' scores in immediate post-tests?

Since the research question is generally enquiring on the effect of WCF on all groups, two hypotheses were formulated because two distinct groups received different treatments and one control group in the study.

H01: There is no statistically significant difference of scores in immediate post-test of the group that received Indirect WCF treatment.

H02: There is no statistically significant difference of scores in immediate post-test of the group that received Direct WCF treatment.

A paired-samples t-test was computed on separate data set of Indirect WCF group and Direct WCF group. Table 3. shows descriptive statistic while table 4. shows the result of paired-sample t-test of indirect WCF group.

**Table 3. Paired Samples Statistics of Indirect Group**

| | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| PRETEST | 17.283 | 32 | 5.06241 | .89492 |
| IMMEDIATE_PT | 21.4375 | 32 | 4.82559 | .85305 |

**Table 4. Paired Samples Test of Indirect Group**

| | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 95% Confidence Interval of the Difference | | | | |
| | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | df | Sig. (2-tailed) |
| PRETEST - IMMEDIATE_PT | -4.15625 | 2.60408 | .46034 | -5.09512 | -3.21738 | -9.029 | 31 | .000 |

The result in table 4 indicates that $t(31) = -9.029$, $p < .05$. It can be concluded from the direction of *t*-value and the means of pre-test and post-test scores that there was a statistically significant improvement observed after the intervention. The mean scores improved from 17.283 in pre-test to 21.4375, an improvement of 4.156 ± 4.156. Therefore, H01 is rejected.

Table 5. shows descriptive statistic of the group that received direct WCF treatment while table 6. presents the results of paired-sample t-test for the group that received direct WCF treatment.

**5. Paired Samples Statistics of Direct Group**

| | Mean | N | Std. Deviation | Std. Error Mean |
|---|---|---|---|---|
| PRETEST | 17.4333 | 30 | 4.97361 | .90805 |
| IMMEDIATE_PT | 25.3000 | 30 | 5.76643 | 1.05280 |

**6. Paired Samples Test of Direct Group**

| | Paired Differences | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | | 95% Confidence Interval of the Difference | | | | |
| | Mean | Std. Deviation | Std. Error Mean | Lower | Upper | t | df | Sig. (2-tailed) |
| PRETEST-IMMEDIATE_PT | -7.866 | 4.39226 | .80191 | -9.50676 | -6.22657 | -9.810 | 29 | .000 |

The result in table 6. indicates that $t(29) = -9.810$, $p < .05$. It can be concluded from the direction of *t*-value and the means of pre-test and post-test scores that there was a statistically significant improvement observed after the intervention. The mean scores improved from pre-test mean of 17.433 to post-test mean of 25.300, an improvement of 7.866 ± 7.866. Therefore, H02 is rejected.

RQ 2: Does significant difference exist between indirect WCF strategy and direct WCF strategy in reducing collocation errors of Low-performing ESL learners?

H03: Significant difference does not exist between the effect of Direct WCF strategy and Indirect WCF strategy in reducing collocation errors of low-performing errors of ESL learners.

This research question seeks to examine whether the two WCF strategies employed in the study produced different or similar effects on participants' test scores after the intervention. Additionally, it is noteworthy to compare the effect of both strategies with the control group. A one-way ANOVA with Bonferroni post hoc comparison was computed to verify if significant differences exist between groups in the scores of immediate post-tests. The results in table 7 revealed multiple comparisons of test scores of immediate and delayed post-test.

**Table 7. Multiple Comparisons of Immediate Post-test and Delayed Post-test**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| IMMEDIATE_PT | Between Groups | 904.826 | 2 | 452.413 | 15.060 | .000 |
| | Within Groups | 2673.642 | 89 | 30.041 | | |
| | Total | 3578.467 | 91 | | | |
| DELAYED_PT | Between Groups | 251.021 | 2 | 125.511 | 4.936 | .009 |
| | Within Groups | 2262.935 | 89 | 25.426 | | |
| | Total | 2513.957 | 91 | | | |

The table above shows that there is a significant difference in immediate post-test ($p < .05$) and delayed post-test ($p < .05$). However, it does not specify on what treatment performs better than others. Therefore, one-way ANOVA with Bonferroni Post Hoc analysis was done to pin-point where the differences appear.

**Table 8. Multiple Comparisons of Immediate Post-test (Bonferroni Post Hoc)**

| (I) GROUPS | (J) GROUPS | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| IWCF | DWCF | -3.86250* | 1.39289 | .020 | -7.2613 | -.4637 |
| | NOWCF | 3.90417* | 1.39289 | .019 | .5054 | 7.3029 |
| DWCF | IWCF | 3.86250* | 1.39289 | .020 | .4637 | 7.2613 |
| | NOWCF | 7.76667* | 1.41518 | .000 | 4.3135 | 11.2198 |
| NOWCF | IWCF | -3.90417* | 1.39289 | .019 | -7.3029 | -.5054 |
| | DWCF | -7.76667* | 1.41518 | .000 | -11.2198 | -4.3135 |

*. The mean difference is significant at the 0.05 level.

It can be seen in table 8 that the participants in direct WCF group outperformed the indirect WCF group with a mean difference of 3.86250 ($p < .05$) and the control group with mean difference of 7.76667 ($p < .05$). Furthermore, the participants in indirect WCF performed significantly better than the control group with mean difference of 3.90417 ($p < .05$) but did not outperformed the direct WCF group ($p < .05$) in the mean scores.

Another one-way ANOVA with Bonferroni post hoc comparison was run to examine if there are significant differences in delayed post-test scores. The results in table 9. reveals multiple comparisons of delayed post-test.

**Table 9. Multiple Comparisons of Delayed Post-test (Bonferroni Post Hoc)**

| (I) GROUPS | (J) GROUPS | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| IWCF | DWCF | -2.83125 | 1.28145 | .089 | -5.9581 | .2956 |
| | NOWCF | 1.13542 | 1.28145 | 1.000 | -1.9914 | 4.2622 |
| DWCF | IWCF | 2.83125 | 1.28145 | .089 | -.2956 | 5.9581 |
| | NOWCF | 3.96667* | 1.30195 | .009 | .7898 | 7.1435 |
| NOWCF | IWCF | -1.13542 | 1.28145 | 1.000 | -4.2622 | 1.9914 |
| | DWCF | -3.96667* | 1.30195 | .009 | -7.1435 | -.7898 |

*. The mean difference is significant at the 0.05 level.

It can be seen from table 9 that significant difference was detected in the scores of the group that received direct WCF intervention and the control group with a mean difference of 3.96667 ($p < 0.05$). Whereas no significant difference was detected in delayed post-test of direct WCF and indirect WCF comparison. The following table 10. shows the summary of comparisons.

**Table 10. Summary of Test Scores**

| Tests | Sequence of effects |
|---|---|
| Immediate post-test | Direct WCF > Indirect WCF* > Control* |
| Delayed post-test | Indirect WCF and Control group have no significant difference (p > .05) |
| | Direct WCF > Control* |

Note. The symbol '>' indicates 'better than' while the asterisk implies that $p < 0.05$

The evidences illustrated in the tables above are suffice for the rejection of third null hypothesis. It is shown from the results that indirect WCF performs better in immediate post-test than indirect WCF. Although no difference is observed between both strategies in delayed post-test, significant difference is detected in the comparison between direct WCF strategies and control group only ($p < .05$). In summary, the direct WCF strategy has more beneficial effect than indirect WCF strategy in reducing collocation errors of the participants in this study.

RQ 3: What are the effects of direct and indirect WCF strategies on collocation errors of low-performing ESL learners' scores over time?

This study employs different groups with different treatments. Therefore, two hypotheses were formulated to answer research question number three.

H04: The measured effect of direct WCF strategy is not maintained over time.

H05: The measured effect of indirect WCF strategy is not maintained over time.

The third research question investigates the retaining effect of both WCF strategies after a period of ten weeks. Two hypotheses are formulated as shown above to answer the research question. A set of delayed post-test instruments were used to examine the retention effect, and a repeated-measures ANOVA with post hoc comparison was used to calculate the effect. However, before repeated-measures of ANOVA can be conducted, the data must approve five assumptions for repeated-measures. All assumptions were met. Mauchly's Test of Sphericity was used as a way to test overall significant difference between the means at different time points. Table 11 shows that the *p* value is less than 0.05 ($p < .05$) which suggests that the means of all tests varies over time.

**Table 11. Mauchly's Test of Sphericity**

| Within Subjects Effect | Mauchly's W | Approx. Chi-Square | df | Sig. | Epsilon[a] | | |
|---|---|---|---|---|---|---|---|
| | | | | | Greenhouse-Geisser | Huynh-Feldt | Lower-bound |
| TEST | .919 | 7.401 | 2 | .025 | .925 | .965 | .500 |

A repeated-measures ANOVA was done to examine the retaining effect of direct WCF strategy. Table 12 shows that significant difference was detected between immediate and delayed post-tests ($p < .05$). Furthermore, the significant difference is also observed between pre-test and delayed post-test ($p < .05$). This indicates that indirect WCF strategy was able to help in retaining the collocational competence of the participants as they still performed significantly well in delayed post-test. H04 is thus rejected.

**Table 12. Pairwise Comparisons of Direct WCF**

| (I) TEST | (J) TEST | Mean Difference (I-J) | Std. Error | Sig. | 95% Confidence Interval for Difference | |
|---|---|---|---|---|---|---|
| | | | | | Lower Bound | Upper Bound |
| Pre | Immediate | -7.867* | .802 | .000 | -9.904 | -5.829 |
| | Delayed | -3.867* | .834 | .000 | -5.986 | -1.747 |
| Immediate | Pre | 7.867* | .802 | .000 | 5.829 | 9.904 |
| | Delayed | 4.000* | 1.059 | .002 | 1.309 | 6.691 |
| Delayed | Pre | 3.867* | .834 | .000 | 1.747 | 5.986 |
| | Immediate | -4.000* | 1.059 | .002 | -6.691 | -1.309 |

*. The mean difference is significant at the .05 level

***Discussion***

The primary objective of this study is to investigate the effect of direct and indirect WCF strategies on collocation errors produced by low-performing ESL learners. Three research questions were formulated and are discussed in the subsequent paragraphs.

The first research question enquires on the effect of both WCF strategies in the immediate post-test scores after the intervention. Since two intervention groups were made available in the study, two hypotheses were derived that described the effect of each WCF strategy. The results reveal that hypothesis one and two are rejected because there are positive significant differences detected in the scores of both intervention groups which indicate that both WCF strategies were able to improve collocational competency of the participants, in the context of this study: low-performing; ESL learners; tertiary level students. This finding is in contrast with Truscott (1996; 2007) but corroborates with Banaruee et al. (2018) and Suzuki et al. (2019) in which the experimental groups in their studies showed significant improvements. Additionally, the findings on first research question also in contrast with Tan and Manochphinyo (2017) who argued that both WCF strategies were not effective in the short-term production of accuracy tested in immediate post-test.

The second research question was formulated to investigate whether the two types of WCF produced different or similar effects on collocation competency of the participants. The results in table 7, 8 and 9 are sufficient for the rejection of the third null hypothesis which show that WCF strategies in this study indeed have different effects on participants' collocation competency. It is noteworthy to mention that both experimental groups outperformed the control group that corroborates with the findings by Karim and Nassaji (2018). Table 10 shows that direct WCF has the most effect than indirect WCF as measured in immediate post-test. However, in delayed post-test, significant difference was detected in a comparison of direct WCF and control group only. Overall, this finding suggests the effectiveness of direct WCF over indirect WCF strategy which also similar with findings from other studies (Chandler, 2003; Ruegg, 2015; Nusrat et al., 2019; Cerezo et al., 2019).

This study has also attempted to investigate the retention effect of direct and indirect WCF strategies which is measured in delayed post-test. The results show that the retention effect is only retained in direct WCF group while the students that received indirect WCF treatment failed to retain their scores in delayed post-test. Furthermore, their scores were also dropped to match the scores in pre-test. This is a clear indication that retention effect of indirect WCF strategy was not retained over time. The finding on retention effect of direct WCF supports other findings by Cerezo et al., (2019) but opposes the findings by Westmacott (2017) that show indirect feedback reinforce learned target structure.

The results demonstrate that collocational errors were reduced or amenable to change via WCF in the case of the experimental groups. Furthermore, direct WCF strategy was observed as producing greater effect than indirect strategy. The determining factor here is the ability of explicitness of the WCF strategy to provide a straightforward repair strategy which is applicable in future writing tasks. The students may opt for another wrong form should the correction is not provided in a well-defined structure via WCF which in turn hindering them to learn a repair strategy for subsequent tasks. In the case of indirect feedback strategy, provided in a structure of symbols such as '*X*', circled, or underlined do not offer profound repair strategies of instruction and guidelines of information that the learners can refer to. Therefore,

practice is insignificant and fail to assist a shift from declarative to proceduralized knowledge because declarative knowledge is not imparted by symbols, the act of circling or highlighting errors alone.

In SAT framework, WCF is expected to benefit L2 learners through practice, if it transfers adequate declarative knowledge that can be shifted progressively into procedural knowledge. The findings of this study corroborate with SAT's prediction regarding the effectiveness or ineffectiveness of WCF strategies. Direct WCF could possibly prove more benefits than indirect in improving learners' collocation accuracy providing that the added information is written explicitly. Using direct feedback to treat error correction is acknowledged by Bitchener and Knoch (2010) who describe it as the strengths of corrective feedback in resolving complex errors and reducing confusion.

## CONCLUSION AND SUGGESTION

The findings of this study have highlighted the pervasive role of indirect and direct WCF strategies in treating collocation errors of low-performing ESL learners which may lead to collocational competence in writing. Overall, even though both strategies show significant effects, and students in the experimental groups outperformed the control group, it is evident that direct WCF strategy is more beneficial in reducing collocation errors of low-performing ESL learners in this study. The evident effect of direct WCF is explained by Ferris and Roberts (2001) that low-proficiency learners gain the most benefit from direct CF for it provides them with unambiguous information to correct their errors.

This study has shifted the focus on error correction studies to emphasise more on non-grammatical aspect of the language as much studies have been devoted to investigating the effect on grammatical structures. Therefore, the effects of other WCF strategies on collocational competency should also be investigated. Furthermore, qualitative method should be integrated to investigate beyond the limits of quantitative instruments. Future studies may also embark on investigating the external variables or factors that may contribute to the retention effect despite some efforts to control the external and internal validity in the study design.

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## BIO-PROFILE

The researcher is a Ph.D. candidate from Universiti Malaysia Sarawak (UNIMAS) who are in the final stage of completing his thesis. He has a profound interest in teaching and has been doing so for the past 8 years.

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