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The effectiveness of direct and indirect written corrective feedback in improving the grammatical accuracy of Omani EFL learners

By

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DECLARATION

I declare that this thesis, from inception to finish, is of my own execution and it has not been previously submitted for the award of any degree.

ABSTRACT

This research examined the effectiveness of direct and indirect written CF on improving the grammatical accuracy of Omani EFL students regarding two newly-learned linguistic structures: the comparative and prepositions of space. The research employed mixed methods whereby a quasi-experiment and think aloud protocol (TAP) were used to answer various questions about written CF.

In the quasi-experiment, the participants were assigned to a control group and two treatment groups: 1) one group received direct corrections written above their errors and 2) one group received the underlining of errors only. Since the linguistic structures had not been previously introduced to the participants of this study, the researcher provided the students with an instruction lesson on them, a week prior to the data collection. A week later, the students received a pre-test and subsequent revision, where they were asked to revise their initial task. Three days after the revision, the students performed a new task focused on the same linguistic structure (immediate post-test) to measure the short-term learning effect of the written CF. The delayed post-tests were administered six weeks after the pre-test in order to measure the long-term effect of the treatment. In all of the tests, the students were required to describe pictures.

The findings of the quasi-experiment show that the direct and indirect written CF improved the grammatical accuracy of the students during revision for both linguistic structures, but a significant effect was found for direct written CF only. The improved accuracy during revision for both the direct and indirect written CF groups was sustained in the new writing task (immediate post-test) regarding the comparative but not prepositions of space. The improvement of the indirect group was even better than that of the direct CF group on the new task (immediate post-test) with regard to the comparative. This might suggest that the indirect CF group processed the feedback in greater depth. No long-term effect was found for direct and indirect written CF for either linguistic structure. The quasi-experiment findings suggest that written CF had a short-term effect when targeting not only already-learned linguistic structures (as the majority of the previous research found) but also newly-learned linguistic structures as well.

While many studies have examined the effectiveness of written CF on improving the grammatical accuracy of learners during revision and in new writing using quasi-experiment designs, little research has been conducted to explore how students engage with and process this feedback. In the current study, a think aloud protocol (TAP) was used to explore how the students processed and repaired their errors in response to both direct and indirect written CF. The findings show that both the direct and indirect written CF groups generated a similar amount of repair with understanding during their subsequent revision. About 35% of the direct group's repair was without understanding. This result suggests that not all of the feedback that was noticed and incorporated into the students' subsequent revision might be understood. Furthermore, the retrospective TAP produced some data that helped to identify some possible reasons why some students repeated their errors and failed to incorporate the written CF into their subsequent revision.

One of the most important findings of this research is that certain factors, such as the type of error and the proficiency level of the student, were found to impact on the effectiveness of written CF. Moreover, the combination of a quasi-experiment and TAP in this research is unique, as it helped to understand the written CF from different perspectives.

LIST OF ABBREVIATIONS

BE	Basic Education in Oman
CF	Corrective feedback
EFL	English foreign language
EFM	"English For Me" Cycle Two Course book name
ESL	English second language
GE	General Education
L1	First language
L2	Second language
MM	Mixed methods
MOE	Ministry Of Education
NL	Native Language
SET	Senior English Teacher
SLA	Second language acquisition
TAP	Think aloud protocols
TL	Target Language
WCF	Written corrective feedback
ZPD	Zone of Proximal Development

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CHAPTER ONE

Introduction

Writing is one of the most difficult skills in English, so most ESL- EFL students tend to make errors. Corder (1967) mentions that, in the field of methodology, there have been two schools of thought in respect to learners' errors. The first is the school which maintains that, if we were to achieve perfect teaching methods, errors would never be committed in the first place, and therefore learners' committing of errors is merely a sign of the present inadequacy of our teaching techniques (Corder 1967, p. 163). The philosophy of the second school is that we live in an imperfect world and, consequently, errors will always occur in spite of our best efforts. Therefore, we should concentrate on techniques and strategies for dealing with errors after they have occurred (Corder 1967, p. 163).

According to Gas (2003, p.225), language learners have access to two types of input; positive evidence and negative evidence. Positive evidence informs the learner of what is acceptable in the target language and contains "the set of well-formed sentences to which learners are exposed" (Gass, 2003, p.225). In contrast, negative evidence provides the learner with information about what is impossible in the target language and is provided through the provision of corrective feedback, CF, in response to the learner's incorrect production of L2 (Gass, 2003, p.225). Long (1996, p.414) emphasises the role of negative evidence in learning: "Negative feedback obtained during negotiation work or elsewhere may be facilitative of L2 development, at least for vocabulary, morphology and language-specific syntax, and essential for learning certain specific L1-L2 contrasts". Feedback can be implicit or explicit (Gass, 1997, p.226); for example, underlining errors and providing corrections is a form of explicit CF while underlining errors only or using error codes is an implicit type of CF. Written CF could be provided on oral and written errors produced by L2 learners (Bitchener and Storch, 2016, p. 10).

Feedback on oral errors has been widely researched in SLA (Bitchener and Storch, 2016). In recent years, researchers have recognised the potential of written CF in L2 learning (Bitchener and Storch, 2016, p. 11). Bitchener and Storch (2016, p.1) define written CF as "a written response to a linguistic error that has been made in the writing of a text by an L2

learner". Ellis (2009, p.98) provides different typologies of written CF (e.g., direct CF, indirect CF, error codes, focused, unfocused, written metalinguistic CF, oral metalinguistic CF, electronic feedback and reformulations). Recent research found that written CF is effective for improving the grammatical accuracy of learners, but the research on the effectiveness of certain types of written CF (e.g., direct versus indirect or focused versus unfocused) remains inconclusive.

This exploratory study aims to examine the effectiveness of written CF strategies, both direct and indirect, in improving the grammatical accuracy of Omani EFL students. It employed a mixed methods approach to reveal different aspects of written CF. The data were collected from a Basic Education school in Oman. Basic Education, BE, was a large-scale reform project which was launched in Oman in 1998-1999. The main aim of the project was to improve the educational system due to national and international demands. The reform covered various aspects, including EFL teaching and learning. The following subsections present some background about Basic Education and EFL teaching and learning in Oman in order to provide some information about the context of the current study. Then, I will discuss the motivation for conducting the current research and present the research questions.

1.1 Basic Education (BE) in Oman

During the 1990s, there was a general feeling and discussion about reforming the education system in Oman (Al Lamki, 2009). Al Hammami (1999) points out that the Ministry of Education in Oman felt that the time had come to introduce major changes to the education system (Al Hammami, 1999). During the late 1980s and early 1990s, a number of evaluations of General Education (GE) were conducted and, based on the shortcomings identified, recommendations were made for improving the educational system in Oman (Al Issa and Al Bulushi, 2012; Al Lamki, 2009).

Another factor which encourages the initiation of the education reform was that, during the 1990s, Oman witnessed major changes in different aspects of life; for example, technology (computers, mobile phones, TVs) affected the way people live and think and people became more aware about what is happening on the other side of the world (Al Lamki, 2009). Parents became educated and more aware about the sort of education they desired for their children (Al Lamki, 2009). Due to these national demands, the Omani government recognized the need to cope with the challenges and requirements of modern life and people's future

aspirations (Al Lamki, 2009). Al Hammami (1999) points out that the education reforms took place not only because of national demand but also partly due to the "demands and needs implied by international recommendations" (Al Hammami, 1999, p. 139).

Based on these demands, the Ministry of Education, MOE, introduced qualitative reform in the education system. A large-scale education reform project was launched, entailing organizational and procedural changes (Ministry of Education, 2004a). The new education system was called Basic Education (BE), and was introduced in the academic year 1998-1999.

The reform covered different aspects of education, such as the educational goals, curricula, teaching approaches, administrative structures, supervision and students' performance assessment. Schools were equipped with computers, laboratories and other modern facilities (Al Issa and Al Bulushi, 2012). Basic Education has been defined as:

"A unified ten-year education provided by the Sultanate of Oman for all children of school age. It meets their Basic Education needs in terms of knowledge, skills, attitudes and values, enabling them to continue their education or training based on their interests, aptitudes, and dispositions, and enabling them to face the challenges of their present circumstances and future developments, in the context of comprehensive social development" (MOE, 2002, p. 6-7).

The implementation of Basic Education occurred in phases, with several schools being targeted every year until all schools were covered by 2010 (Al Issa and Al Bulushi, 2012). Basic Education covers a span of 10 years, and has been divided into two cycles according to the students' age, and the characteristics and growth needs of each cycle. Cycle one includes grades 1 to 4, from 6 to 10 years old, and Cycle two includes grades 5 to 10, from 11 to 16 years old (this cycle is called lower secondary classes) (Al Issa and Al Bulushi, 2012). After students finish grade 10, they move on to Post Education (grades 11 and 12). In Post Education, students need to specialize in either science or art studies. English is a required subject that must be studied by both art and science students. Grade 12 Post Education students sit National Exams at the end of the academic year and, according to their final results, can apply for a place at different colleges and universities both inside and outside Oman (Al Issa and Al Bulush, 2012).

Cycle one schools are mixed gender, and are only taught by female teachers. Co-education at the primary level was introduced in 1998-1999. Cycle two schools, on the other hand, are single gender; male teachers teach male students, and female teachers teach female ones. Cycles one and two can be found in the same school building, as the entire teaching staff is female.

1.2 EFL learning in Oman

English language was introduced from grade one for the first time in the new system, BE. It used to start from grade four at the age of 10 before 1998-1999 (Al Issa and Al Bulushi, 2012). The English syllabus and teaching techniques have been reformed in both cycles and in post education to meet the aims of the new system. The communicative approach has been widely adopted, as the ultimate aim of English language teaching and learning is to enable students to use the language communicatively (MOE, 2002). Students have 5-7 English lessons per week and each lesson lasts for 40 minutes, so students receive 200-280 minutes of English language instruction per week. Students have two semesters and each semester lasts for about 4 months (World Data on Education, 2010).

Each grade in the Basic Education Schools uses an English national course book called "English for Me"; (EFM) for grades 1-10 and "Engage with English" (EWE) for grades 11-12. These course books were designed on the basis of the new reform project and according to the learners' needs, abilities and interests in each grade (MOE, 2002). All Basic Education Schools must use these course books and are required to cover the lessons included in each book for each semester. Therefore the course book is seen as the syllabus and is the main source of input (ELCS, 2010).Teachers are provided with all of the teaching materials and resources that they need in order to teach the syllabus. In each Basic Education school, there is a Learning Resource Center which includes materials and resources for teaching most of the subjects in the school, including English (ELCS, 2010). The center includes resources such as computers, videos, cassette players and different English books and stories, but the EFL teachers rarely use these resources (Al-Jardani, 2012). One explanation for this could be the number of English units that the teachers must address over a semester. Each course book includes five chapters and teachers need to cover all of the chapters within the allocated time. With intensive materials in each course book, teachers may find it challenging to spare time to use materials outside the text books. Moreover, the lessons in each course book are highly structured, providing little room for flexibility.

Most students in Oman are rarely exposed to English outside the classroom (Al-Jardani, 2012). Very few Omani children have the opportunity to listen and speak English with their parents at home and such cases might be only found in big cities like Muscat. However, some of them might be exposed to English through TV channels and the internet, but this is also very limited. This limited exposure to English outside the classroom means that children do not have the opportunity to practice L2 in real contexts (Al-Jardani, 2012). This might create difficulties for teachers seeking to implement the syllabus, as they need to provide more interactive opportunities to use the language in their classrooms, and to do so in an interesting and enjoyable way (Al-Jardani, 2012).

Public schools include both Omani and non-Omani EFL teachers. The non-Omani teachers include different nationalities (Egyptian, Sudanese, Jordanian, Palestinian and Indian) (Al-Jardani, 2012). To tackle the problem of unemployment and reduce the dependence on foreign labor, the Omani government decided to 'Omanize' some professions such as teaching and nursing (Zerovec and Bontenbal, 2011). Omanization is a policy enacted by the government of Oman in 1988 aimed at replacing foreign 'expatriate' workers with Omani nationals (Al Lamki, 2000, p.2).

Most Omani EFL teachers at Basic Education Schools are Bachelor holders who graduated from universities and colleges inside or outside the country. The Ministry of Education is concerned about the professional development of Omani EFL teachers at Basic Education Schools as it provided a three year programme to qualify all EFL teachers who hold Diploma qualification. The programme aimed to grant Diploma holders a Bachelor qualification and to upgrade the teachers' skills and teaching methods in order to be effectively able to implement the new syllabus, BE in the EFL classroom. For employing new teachers, the Ministry of Education also requires IELTS certificate from teachers of no less than level 6.

Countries worldwide have recognized the importance of including English in their education systems, beginning even in the early school days of their young learners, although this has also been critiqued (Copland and Garton, 2014). Copland and Garton (2014, p. 224) suggest that the assumption that "younger is better" is controversial, as previous research produced contradictory findings, and no conclusive evidence was found that proposes the benefits of the early introduction of English into the primary school curriculum.

Nevertheless, English is introduced into early primary education in many countries around the world (Copland and Garton, 2014). One of the aims of the Ministry of Education in Oman in introducing the teaching of English from grade one is to achieve the ultimate goal of enabling students to use the English language communicatively (Ministry of Education, 2007, p.8). Through introducing English from grade one instead of grade four, one might expect that the level of secondary school graduates will be relatively higher. However, Al Mahrooqi (2012) points out that many first year university entrants have a low level of English. Al Mahrooqi (2012) conducted a study to examine what students at an Omani university thought were the reasons for their low level of English. She used a questionnaire and focus group. About 85% of the students thought that the teachers were the major cause of their low level proficiency for many reasons (e.g., lack of motivation, teachers ignoring weak students, teachers not speaking with students in English outside class, the boring methods of teaching). About 80% of the students saw the curriculum as another important cause. They thought that learning and teaching were highly dependent on the textbooks, which were boring, and the topics covered were unimportant, inappropriate and uninteresting (Al-Mahrooqi, 2012).

Al Mahrooqi (2012) points out that the 12 years of English learning in Basic Education Schools has produced only meager results. By increasing the amount of EFL input from 9 to 12 years, it was expected that the students' proficiency level would improve (Al Mahrooqi, 2012), although research has shown that the relationship between the time spent learning a language and the level of proficiency achieved is not always linear in nature (Murphy, 2001).

The current situation in Oman is that, despite the fact that EFL was introduced earlier, at the age of six, and communicative approaches were adopted (Ministry of Education, 2007, p.8), no big improvement in the proficiency level of the students was identified (Al Mahrooqi, 2012). School students remain weak, especially with regard to communicative skills (speaking and writing) (Al Hosni, 2014; Al Syabi and Tuzlkova, 2014).

One of the reasons for the low proficiency level among Basic Education students is that, although the Ministry of Education, MOE, provides in-service training for Basic Education, the teachers may find it challenging to introduce child-centered, communicative approaches in large classes (N=30). Copland et al. (2014, p.740) point out that communicative approaches were developed in western countries to teach adults in small, well-equipped

classrooms, and so may be inappropriate for teaching large groups of children in classrooms where the resources are limited (Copland et al. p.740).

The limited hours of language exposure could be another challenge to EFL learning in the school context (Copland and Garton, 2014, p. 224). In Oman, students in the Basic Education schools attend five 40-minute lessons per week and, due to the large number of students per class (N=30), each student has a very limited opportunity to receive comprehensible input from the teacher which focuses on meaning through interaction. Moreover, the classroom is the main source of EFL input and most students rarely receive extra exposure to English outside the classroom (Al Jardani, 2012).

After some evaluation of EFL teaching and learning within the new system (BE), MOE recognized these challenges. Although the Ministry provides in-service training for EFL teachers in the Basic Education schools, Al Rasbiah (2006) stresses that these training programs failed to meet the teachers' needs and pay little attention to the problems that the teachers face in ELT (English language teaching). Copland et al. (2014, p.740) emphasize that one of the challenges associated with applying communicative approaches in EFL is that the teachers may receive training on theory alone, and so may struggle to implement these approaches effectively in the EFL classroom. Therefore, teachers' training programs should evolve from their needs and be based on the challenges they face with regard to implementing these approaches in the Omani EFL classroom context.

1.3 Writing in the Cycle Two EFL classroom

Writing is an important language skill. In Basic Education Schools, it is introduced gradually in the early grades (grades1-4/ cycle 1). In cycle one (grades 1-4), students start writing separate words, short phrases and sentences. In cycle two (grades 5-10), they start writing longer sentences and produce paragraphs (MOE, 2016).

Grammatical rules are introduced formally later, after the students have already encountered the patterns in earlier activities (e.g., reading, speaking) (MOE, 2016). The course books provide students with writing tasks where they practice the different grammatical structures that have been already covered (MOE, 2016). Although the Teachers' Guidebooks encourage teachers to apply process writing, few teachers who are committed to this (Al Seyabi and Tuzulkova, 2014).

Traditionally, for example in writing classes, teachers provide students with a picture, elicit sentences orally about the picture and write them on board. The writing is used as a model as the students are then asked to describe another picture using the model on the board. After the students have been given time to write the new descriptive paragraph, the teachers elicit it from them and write it on board. The rest of the class copies the paragraph from the board. Instead of using communicative and process writing, many teachers in BE still use the traditional methods of teaching writing (e.g., model or guided writing). Time constrains and an unawareness among some EFL teachers of the importance of process writing might be the reason why some teachers fail to apply it in their writing classes (Al Seyabi and Tuzulkova, 2014, p.44).

1.4 Written corrective feedback (CF) in the Cycle Two EFL classroom

The Teachers' Guidebook for each grade of EFL provides some guidelines about the correction of writing errors. For grades 5-7, teachers are guided to be sensitive in their correction and not to attempt to highlight and correct every error made. This means that the teachers are encouraged to be focused in their written corrective feedback (henceforth, CF) (MOE, 2016). Despite the guidelines and due to the poor writing performance of the students in Cycle Two Basic Education Schools, the teachers choose to give comprehensive feedback. In her study, Al Bakri (2015, p.55) found that teachers believed that comprehensive written CF is necessary for improving students' writing. Lee (2003, p.221) found that most teachers use comprehensive written CF both because it is required by the school administration and also because the parents want the teachers to correct all their children's errors. The students themselves prefer comprehensive written CF, as found in a number of studies. For example, Amrhein and Nassaji (2010) found that 93.9% of the students believe on the effectiveness of written CF and prefer to receive it on all of their errors. The majority of the students in Lee's (2005) study prefer to receive comprehensive CF that targets all of their errors.

The Teachers' Guidebooks for teaching EFL in Oman fail to provide sufficient guidelines regarding the various strategies related to giving written CF and when or how to use them in classroom. In general, most of the teachers in the Basic Education schools use direct correction and indirect CF (underlining) in grades 5-9, while some teachers use error codes in the higher grades (10-12). Direct correction is preferred by Omani teachers, who may believe that it provides the students with the information they need to resolve their errors. The teachers believe that it is their duty to provide the students with error corrections. They

believe that it is their responsibility to transmit knowledge, which they describe as the "essence of teaching", through making direct corrections (Al Bakri, 2015, p. 54). The teachers also believe that, if the students see the corrections, they will be able to remember them and therefore avoid repeating the same errors in their subsequent writing (Al Bakri, 2015, p. 55). A study from another context (e.g. Ferris, 2006) also found that one of the three teacher participants provided direct CF following his instinct that the students would be unable to revise their writing unless the correct forms were provided.

Moreover, Omani students prefer direct CF and think that it is more effective than indirect CF. For example, Al Ajmi (2015, p.66) found that 68% of the Omani students preferred direct CF. Only 28% of them believe that indirect CF might be helpful. In his study, some students reported that they cannot correct errors without the help of their teachers and prefer to have their errors corrected by their teachers to avoid ambiguity (Al Ajmi, 2015, p.66). Some students see that direct written CF is more beneficial because it helps them to understand and resolve their errors (Amrhein & Nassaji, 2010). Moreover, demands regarding using direct corrections come from both the school administration and parents, as they request comprehensive corrections, believing that it is the teachers' responsibility to locate and correct the students' errors (Lee, 2003, p. 226).

1.5 Motivation for the current study

In 1999, I graduated from the College of Education of Sultan Qaboos University, and began teaching English as a foreign language, (henceforth, EFL) at a public school in Oman. I taught female teenage students and found teaching very enjoyable except for the error correction work as, nearly every day, I had to take my students' written work home and spent hours going through their texts, correcting errors, which took considerable time and effort. Moreover, it was frustrating, especially when my students repeated the same errors in their revisions and new writing. I started thinking about the best way to correct my students' written work and wonder if there was a simpler, more effective way to do it.

In 2004, I was working as a senior English teacher (SET) in a Basic Education Cycle Two School in Oman. As part of my job, observing English classes provided me with an opportunity to notice the different classroom practices of the teachers. Written CF was one of the teachers' classroom behaviors that attracted my attention. From the students' portfolios and written work, it was clear that they made a lot of errors in their writing. Those errors

related to a mixture of form, word order, spelling, punctuation, sentence structure and content. The teachers tended to correct every single grammatical error in the students' writing, so a piece of student's writing could be full of corrections and red marks. Few teachers adopted selective strategies regarding written CF, and the teachers tended to employ instead indirect, focused and unfocused written CF types, possibly because of a lack of sufficient guidelines in the Teachers' Guide Book with regard to written CF.

When I engaged in post-lesson discussions with the English teachers, a lot of comments were made about written CF. The teachers kept saying that, although they devoted considerable time and effort to correcting their students' written work, the improvement in their students' linguistic accuracy was very limited, and their students continued to make the same errors in their revised and new pieces of writing. This, of course, negatively affected the students' writing, resulting in poor performance in exams. Consequently, the overall accuracy improvement of the students' writing was affected in the long-term.

During Regional Senior English Teachers meetings, similar problems related to students' writing and teachers' written corrective feedback were reported. Questions were raised about how the teachers could best react to students' written work, and whether the teachers' written CF was at all effective in improving their students' linguistic accuracy. If so, the question then became: which written CF methods are more effective? Do Omani EFL students benefit from direct and indirect CF (underlining and error codes)? Are there any errors which are more amenable to correction than others? Do students of different proficiency levels react similarly or differently to different types of written CF? Why do some students repeat their errors in their subsequent writing?

The early research on written CF presented no solution but rather raised more questions in my mind. My understanding was further challenged when I read about the "Focus on Form Debate", which was raised by Truscott (1996) when he mounted a case against grammar correction. The mixed and conflicting findings of the early research made the topic of written CF more ambiguous. Unlike earlier research, the majority of the more recent research provides evidence of a positive and statistically significant effect of written CF but, in terms of the efficacy of particular types of written CF, the research evidence remains limited and inconclusive.

At this point, I decided to apply for a PhD and research the topic of written CF. I became curious about examining the relative effectiveness of written CF strategies, which are

commonly used in Oman BE schools (direct CF and indirect CF). Reviewing the literature, the research on direct and indirect written CF appeared to have produced contradictory and inconclusive results. Some researchers found no significant difference between the two strategies, which others found either direct CF or indirect CF to be superior.

Searching for written CF research which had been conducted in a similar context to Oman, I found two published studies (e.g., Al Ajmi, 2015, Al Bakri, 2015). Alajmi (2015) conducted a quasi-experiment to examine the effectiveness of written CF in improving the linguistic accuracy of English prepositions. His study included two groups: the treatment group received written CF on their writing and oral metalinguistic tutorials, while the control group received general comments on their writing. The researcher also used an open-ended questionnaire to obtain the students' views on the type of feedback they receive from their teachers. The results show that the treatment group, which received written CF, improved in both the immediate and post-tests, while the control group did not. Regarding the students' attitudes to written CF, 68% of the respondents reported that they prefer direct over indirect CF, because they are unable to figure out the correct answers if these are not provided by the instructor. The majority of the respondents reported that they prefer direct written CF with meta-linguistic explanations (of grammatical rules). This finding is in line with other researchers (Shintani and Ellis, 2013), who found that a meta-linguistic explanation, ME, encourages greater depth of processing on the part of the students as they have to apply the ME to their own errors (Shintani and Ellis, 2013, p.228). The majority of the respondents also prefer focused written CF because it reduces the frustration and helps them to focus their attention.

Al Bakri (2015) explored the teachers' beliefs and practices regarding written CF. An exploratory case study was employed using semi-structured interviews with teachers and the written assignments of L2 learners. The study reveals that the teachers' beliefs and contextual factors affected their written CF practices. Al Bakri (2015) found that discrepancies existed between the teachers' stated and actual written CF practices. She found that the teachers over-used direct comprehensive written CF and that there was a lack of communication between the teachers and students regarding writing CF. In her study, she found that the teachers' beliefs are mainly shaped by their personal language learning and teaching experiences.

Al Ajmi's (2015) quasi-experiment did not focus on the relative effectiveness of different types of written CF (e.g., direct versus indirect or focused versus unfocused). Rather, he

tackled the issue of direct and indirect CF by gathering the views of students via a questionnaire. Al Bakri's (2015) study mainly focused on teachers' beliefs and whether or not these were reflected in their classroom practices. Generally speaking, research on written CF in Oman is scarce. Moreover, both studies, Al Ajmi (2015) and Al Bakri (2015) were conducted in a college setting.

The current study aims to contribute to the existing research by examining the relative effectiveness of direct and indirect written CF in improving the grammatical accuracy of school students in Oman. Direct and indirect written CF are targeted because they are the most common strategies used in EFL classes in the Cycle Two Basic Education schools in Oman, where the data collection took place. In this research, I was curious to discover whether direct and indirect written CF are effective for improving the grammatical accuracy of students, and whether this effectiveness varies according to the type of feedback (direct versus indirect), type of error (rule-governed/comparatives versus less rule-governed/prepositions), and whether the proficiency level of the students plays a moderating role on the effectiveness of indirect written CF.

The majority of the research has examined the effectiveness of written CF by using quasi-experiments, where evidence of improvement was measured by the final performance of the learners. The learners' response to written CF and how learners process written CF has been less widely researched. In this thesis, students' uptake in revision is examined as well. It is interesting to explore how the students repair their errors in response to direct and indirect written CF in their subsequent revision and whether they repair these errors with understanding or not in response to the two different types of written CF. It is hypothesized that learners attend more to explicit types of written CF than to less explicit ones (Bitchener and Storch, 2016). In this study, it is expected that the students will attend to and understand more direct CF than indirect CF because the former type of feedback is more salient. I also used retrospective TAPs to negotiate CF with students on the errors they committed in their subsequent revision to understand difficulties they faced while processing CF.

1.6 Research questions

In order to find answers to the various different questions, the current research employed a mixed-methods approach, where both quantitative and qualitative methods were used. A

quasi-experiment was used to find answers to research question 1 and sub-questions 1a, 1b and 1c. Think aloud protocols, TAP, provided answers to research question 2 and research question 3. The research questions are formulated as follows:

Research question 1: Does written CF help Omani EFL students to improve their grammatical accuracy with regard to newly-learned linguistic structures during revision and in new writing over time?

Research sub-question 1a: Does the effectiveness of written CF vary according to the targeted linguistic structure (the comparative versus prepositions of space)?

Research sub-question 1b: Does the effectiveness of written CF vary according to the type of feedback (direct CF and indirect CF)?

Research sub-question 1c: Does the effectiveness of indirect written CF vary according to the proficiency level of the students (higher versus lower level)?

Research question 2: How do the students repair their errors in response to direct and indirect written CF in their subsequent revision?

Research question 3: Why was some written CF not incorporated by certain students into their subsequent revision?

1.7 Thesis structure

This thesis is structured as follows:

Chapter One provides some background about the context and motivation of conducting the current research. Chapter Two reviews some SLA theories and explains how these theories perceive the role of written CF in L2 learning and acquisition. The chapter also discusses the moderating factors that may impact on the effectiveness of written CF (e.g. type of feedback, type of errors and the proficiency level of the learners).

Chapter Three provides a review of the previous written CF research. First, an overview of the grammar correction debate is presented to identify the underpinning issues raised by some researchers regarding the role of written CF in L2 learning. Then, a review of the early and more recent written CF research is presented. Since the current study targets both direct and indirect written CF, there will be a focus on the research that examined the relative effectiveness of these two types of written CF. There will be a discussion of the research that examined learners' uptake and processing of written CF as well.

Chapter Four explains the research methodologies which are employed in this research. It provides detailed explanations of the research's philosophical worldview, approaches and methods. Details are also provided of the tools, instruments and procedures for the data collection and analysis. Chapter Five discusses the data analysis and results of the quasi-experiments. Chapter Six presents the TAP analysis and results. Chapter Seven provides a discussion of the research findings. The discussion will be presented according to each research question. In the discussion, I will draw upon SLA theories as well as the findings of other research in the field. In Chapter Eight, the contributions of the current research will be highlighted and recommendations for future research will be outlined.

In the next chapter, there will be a discussion on SLA theories which have something to say about the role of written CF. The chapter also provides some theoretical explanations on the factors that may impact the efficacy of written CF.

CHAPTER TWO

Theoretical Perspectives on Written CF

2.1 Introduction

In the literature, feedback has been largely explained within an oral context. Researchers believe that feedback in a written mode can be successfully utilized for developing L2 (Bitchener and Storch, 2016). Williams (2012) points out that writing plays an important role in facilitating and developing L2 because writing is slower than speaking, therefore it provides better time for cognitive processing (Williams, 2012, p.322). It is easier for learners to focus on form in writing than in speaking as written input is more salient and provides a permanent source of learning, which learners can refer to whenever they need (Williams, 2012, p.322). Williams (2012) also suggests that learners have better opportunities for hypothesis testing when they write than when they speak (Williams, 2012, p.328). Another thing is that providing feedback in a written mode (instead of oral) after learners finish writing might reduce anxiety (Bitchenr and Storch, 2016). These potentials of writing may justify the role of written CF in facilitating cognitive processing and L2 development.

It is essential to talk about second language acquisition, SLA theories, when discussing the role of written CF for developing L2. Written CF research is cognitively or socio-culturally informed (Bitchener and Storch, 2016). Lyster, Saito & Sato (2013, p.9) point out that "theoretical perspectives that run the gamut from cognitively to socially oriented suggest that CF is not only beneficial but may also be necessary for moving learners forward in their L2 development". The current research is informed by perspectives from both cognitive and socio-cultural theory. Guo (2015) points out that theories may guide written CF research, and written CF studies, may be in turn, contribute to theory-building by revealing how L2 develops. In sub-section 2.3, there will be a discussion of different SLA theories and what these theories say about the role of written CF in L2 learning and acquisition.

However, before discussing SLA theories, a brief discussion is presented about how learning and acquisition are differently viewed. It is important to note as well that in this thesis, the terms L2 learning and L2 development are used since the study examined whether written CF is effective in the development of new, explicit L2 knowledge in a classroom context.

2.2 L2 learning

Krashen (1982) argues that learning and acquisition are two different things. Learning is a conscious act which happens in an attentional context (classroom) and acquisition is a subconscious process which occurs in a naturalistic environment (Krashen, 1982). And since they are different, they result in two different competences (Krashen, 1982). The 'acquired competence' requires automatic and unconscious processing, while the 'learned competence' requires controlled and conscious processing (Krashen, 1982).

Knowledge of acquired competence is referred to as 'implicit', and knowledge drawing upon learned competence is referred to as 'explicit' (Ellis, 2008). Skill acquisition theories which will be discussed in sub-section 2.3.3, use 'declarative knowledge' and 'procedural knowledge' to refer to these two types of knowledge.

The issue of the conversion of explicit knowledge to implicit knowledge remains debatable in SLA (Ellis, 2008). Theorists and researchers are interested in whether the declarative knowledge which results from explicit learning processes can be converted into procedural knowledge that is accessible in the same way as implicit acquired knowledge (Dekeyser, 2003, p.328).

Krashen (1985, 2003) is against the conversion as he insists that they are two separate processes. Truscott (2004, 2007) supports Krashen's position, claiming that explicit knowledge will only have a superficial effect and therefore will not facilitate L2 development over time. Dekeyser (1998, 2003), on the other hand, believes that the conversion could occur through systematic and well contextualized practice. In coming sub-sections, the conversion of explicit knowledge to implicit knowledge and the role of written CF in the transfer process will be explained through discussing skill acquisition theory, sub-section 2.3.3 and through Housen and Pierrard's (2005) model of how new explicit L2 knowledge is developed, sub-section 2.4.

2.3 SLA theories and the role of written CF

Theoretical support for the role of written CF in language learning come from different SLA theories. In this sub-section there will be a discussion of different SLA theories and hypothesis, and how each of them perceive the facilitative role of written CF in L2 learning.

2.3.1 Noticing Hypothesis

The Noticing hypothesis is proposed by Schmidt (1990, 1994) which claims that 'input does not become intake for learning until it is noticed' (Schmidt, 2010, p. 721). That is, learners cannot learn grammatical forms and structures unless they notice them. Schmidt (2010) proposes that noticing is a conscious process which is necessary for learning. Drawing on his personal experience of learning Portuguese in Brazil, Schmidt found that he was able to use the grammatical forms he noticed during his interaction with native speakers, but he failed to acquire grammatical forms and structures he did not attend to and notice (Schmidt, 2010). Although he received frequent corrections on his grammatical errors during his interaction with native speakers, in most cases that had no effect, because he was unaware that he had been corrected. Schmidt (2010) suggests 'noticing the gap', that is in order to resolve errors, learners must make conscious comparison between their own output and the target language input (Schmidt, 2010). Here comes the role of corrective feedback. Corrective Feedback provides learners with the opportunities to notice the gap or mismatch between the learners' output-errors and the teachers' input-feedback, and push them to modify their erroneous output (Bitchener and Storch, 2016). Noticing which is triggered by corrective feedback promotes self-repair and therefore facilitates language development (Bitchener and Storch, 2016).

2.3.2 Output Hypothesis

Swain's (1985) output hypothesis was based on her observation of students learning French in immersion classes in Canada. She noticed that although immersion students developed comprehension skills, their production skills especially with respect to grammatical accuracy were far behind their native-speaking peers. She noted that immersion learners received a rich amount of comprehensible input with minimum focus on production skills. Swain (1985) asserts that comprehensible input alone is inadequate for language acquisition to take place and that learners must be pushed to produce output in order to develop grammatical accuracy. She argued that lack of opportunities for pushed output led students to their failure to achieve grammatical accuracy.

In her output hypothesis, Swain (1995) defines three functions for comprehensible output: a noticing function, a hypothesis testing function and a metalinguistic function. The first function is consistent with the noticing hypothesis. For learning to take place, the learner must notice the gap between their interlanguage and the target language when they process

spoken or written output (Swain, 1995). By noticing the gap, the learner becomes aware of it and may be able to modify it, so he-she learns something new about the language. Learners sometimes attempt to produce output in the second language, but they may not know or remember the necessary linguistic forms needed for communication (spoken or written), and this means that learners notice a hole in their interlanguage. By attempting to produce output, they are forced into noticing what they do not know or partially know about that particular form or structure (Swain, 1995). Swain (1995) posits that noticing holes in their interlanguage makes them pay careful attention to relevant linguistic structures in future input (Swain, 1995)

Second, output provides learners with opportunities to test their hypotheses about linguistic accuracy and comprehensibility, and thereby modify their hypotheses in response to the feedback they receive from others (e.g., teachers or peers) (Swain, 1995). If the corrective feedback is sufficient and salient, learners will be able to notice the gaps between their interlanguage and the target language which triggers restructuring of the target language grammar (Panova and Lyster, 2002, p. 573). Third, output serves a metalinguistic function as it enables learners to reflect on their target language (Swain, 1995).

2.3.3 Skill Acquisition Theory

Skill acquisition theory draws upon Anderson's (1983, 1992, 1993) Adaptive Control of Thought, ACT (Tai, 2014). It postulates that learning a second language is similar to learning other skills (Bitchener and Ferris, 2012). Skill acquisition is explained as "a gradual transition from effortful use to more automatic use of the target language, with the ultimate goal of achieving faster and more accurate processing." (Lyster and Sato, 2013, p. 71). The theory proposes a role for both explicit and implicit learning in SLA. It posits that declarative knowledge which draws upon explicit learning or processes can be transformed to procedural knowledge which involves implicit learning (Anderson, 1993). Declarative knowledge refers to knowledge of the language system such as grammatical rules (Lyster and Sato, 2013, p. 72). While procedural knowledge refers to how to perform activities such as the ability to apply grammatical rules and produce language with less or no effort of accessing items in long-term memory (Lyster and Sato, 2013, p. 72).

Andersons' model posits three stages in the proceduralisation of declarative knowledge to procedural knowledge (Anderson, 1992, 1993). First rules are learned in an explicit manner,

then, after repeated practice, tasks can be completed rapidly and efficiently with fewer errors (Anderson, 1992, 1993). DeKeyser (2007, p.1) defines practice as "specific activities in the second language, engaged in systematically, deliberately, with the goal of developing knowledge and skills in the second language". According to Anderson's ACT, transformation of declarative knowledge into procedural knowledge occurs through meaningful practice (Dekeyser, 2007). That is repeated practice with feedback are crucial elements in the gradual shift from declarative knowledge to procedural knowledge as they promote meaningful learning rather than mechanical skill, and thereby contributes to automatization (Dekleyser, 2007; Lyster and Sato, 2013). Feedback plays a central role here as it provides controlled practice opportunities for learners to acquire L2 knowledge (Lyster and Sato, 2013). It draws attention to target language forms in ways that contribute to restructuring of learners' interlanguage (Lyster and Sato, 2013).

2.3.4 Interaction Hypothesis

Krashen (1985) highlights the importance of comprehensible input on L2 acquisition in his 'Input Hypothesis'. He argues that exposure to a sufficient amount of comprehensible input at the 'i+1' level (slightly more advanced than the learners' current level) leads automatically to acquisition. However, Krashens' Input Hypothesis has been criticized for its vagueness and imprecision, that is what exactly does '1' refer to? And how one can make sure that the input is just a little more advanced than the learner's current level '1'? (Bitchener and Ferris, 2012). Long (1981) argues that only conversational interaction between the learner and the teacher could ensure that the learner is receiving 'i+1' input. Long suggests that if conversational adjustments in interaction makes input more comprehensible (which is facilitative to L2 learning), then linguistic and conversational adjustments that occur during interaction may facilitate language learning.

However, Long's (1981) Interaction Hypothesis has been criticized for being focused on meaning 'functional aspects of language' rather than linguistic 'grammatical' development. In his reformulated Interaction Hypothesis, Long (1996) suggested that interaction encourages attention to form. He suggested that interaction may facilitate L2 development for vocabulary, morphology and language specific syntax (Long, 1996). He stated that the extent to which L2 input contributes to L2 development is determined by the learners' processing capacity and degree of attention to linguistic structure (Long, 1996).

Long's (1981, 1996) Interaction Hypothesis has proposed a role for oral feedback as the teacher and the learner interact and negotiate to achieve mutual understanding of the input. The Interaction Hypothesis was originally developed in an oral context where negotiation is an unavoidable component to maintain oral communication and provide oral CF. In a written context, the situation is different, as the learner's output does not depend on instant mutual understanding, therefore no negotiation is needed during the learner's production of writing. However, this does not mean that the Interaction Hypothesis does not propose a role for written CF. Negotiation can be applied after instead of during the production of written texts (Bitchener and Storch, 2016). Feedback on the learner's written errors can be provided in an oral manner via negotiation-scaffolding between the teacher and the learner. Moreover, written CF could be provided in a combined way, that is the learner first receives written CF on his/her work and further that written CF is scaffolded-negotiated with the learner, thus the optimal L2 development can be expected.

2.3.5 Socio-cultural Theory

Another interactionist perspective comes from socio-cultural theory, SCT. Socio-cultural theory is based on the work of Lev Vygotsky (1978) and then it was developed further by his colleague Leontieve (1978), and scholars in second language acquisition (e.g., Lantolf, 2000 and Swain et al., 2011) (cited in Bitchener and Storch, 2016). Socio-cultural theory views mental activities such as language learning as a socially mediated process (Nassaji, 2017, p.117). That is, language develops when there is an interaction between an expert (e.g. teacher) and a novice (e.g. L2 learner). There are three basic concepts in sociocultural theory that have important implications about what effective written CF is: Zone of Proximal Development (ZPD), scaffolding and regulation (Nassaji, 2017).

The Zone of Proximal Development is defined as "the distance between the actual development level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers." (Vygotsky, 1978, cited in Nassaji, 2017, p. 117). The concept of ZPD emphasizes the importance of negotiation in language learning. Collaboration within the learner's ZPD helps him/her to develop what he/she has not yet mastered independently (Nassaji, 2017). When feedback is provided through negotiation, the expert (e.g. teacher) will be possibly able to discover the learner's developmental level 'ZPD' and therefore provide

feedback in appropriate ways according to the learner's developmental level (Nassaji and Cumming, 2000).

Scaffolding is the concept used to describe the effective assistance provided within the learners' ZPD. Scaffolding refers to the "guided support learners receive during interaction" (Nassaj, 2017, p. 117). Scaffolding is a support that is negotiated within the learners' ZPD and jointly constructed based on the learner's developmental needs and capacity. One of the features of effective scaffolding is to extend the learner's understanding and abilities, so the teacher pushes the learner to reach a zone beyond his-her current developmental level (Hammond and Gibbones, 2005). It is temporary as it is provided when it is needed and withdrawn gradually as the learner develops and is able to act independently (Hammond and Gibbones, 2005). It is contingent that it should address the minimum needs of a learner and starts from his-her current developmental level (Hammond and Gibbones, 2005). In literature, scaffolding is more discussed in relation to oral errors (Nassaji, 2017). However, teachers can provide scaffolded feedback on writing errors (Nassaji, 2017). Teachers may choose to scaffold learner's errors after providing direct and indirect written CF to further assist them (Nassaji, 2017). When written CF is scaffolded, L2 learning is optimized (Nassaji, 2017).

Regulation is another important concept in socio-cultural theory. It refers to how individuals are capable of managing their own learning (Bitchener and Storch, 2016). Sociocultural theory views learning as a process of moving from other regulation to self-regulation (Nassaji, 2017). Other regulation means that a learner needs support from others as he-she has not yet gained control over his-her learning. Self-regulation means that the learner becomes autonomous in his-her learning and is skilled enough to act independently (Nassaji, 2017). Interaction in a form of scaffolded CF helps other regulated learners to become self-regulated (Nassaji, 2017).

To sum up this section, different SLA theories provide support for CF in language development. These theories provided explanation for the facilitative role of CF from both cognitive and interactionist sociocultural aspects.

In the next sub-section, there will be a discussion on how new L2 knowledge is developed since this study targeted newly learned linguistic structures. There will be explanations on how written CF plays a role in the development process of new L2 knowledge.

2.4 How new L2 knowledge is developed and the role of written CF

Housen and Pierrard (2005) point out that new L2 knowledge is developed through three sequential macro-processes. These processes are presented in Figure 2.1. Knowledge internalization is the first stage in cognitive processing where form-meaning connections are established through noticing and processing input (Housen and Pierrard, 2005; Williams, 2012). In the modification stage, learners keep restructuring knowledge by refining the form-meaning connections through receiving additional positive and negative evidence/input (Housen and Pierrard, 2005, Williams, 2012). Positive evidence provides learners with well-formed input, whereas negative evidence (corrective feedback) provides information about what is not acceptable in L2 (Long, 1996). Negative input in a form of (corrective feedback) plays an important role here as by using it learners have the opportunity to hypothesis testing and restructuring their explicit knowledge (Williams, 2012). However, learners need to strengthen their L2 knowledge through conscious, repeated and controlled processing. This is the last stage where L2 knowledge is consolidated through practice and it becomes more accurate and rapid (Housen and Pierrard, 2005, p.6). The three stages of L2 cognitive processing presented in figure 2.1 might appear separate but they overlap (Williams, 2012) as during stage one and two the explicit knowledge is developed and during stage two and three the L2 knowledge is consolidated through frequent practice (Guo, 2015).

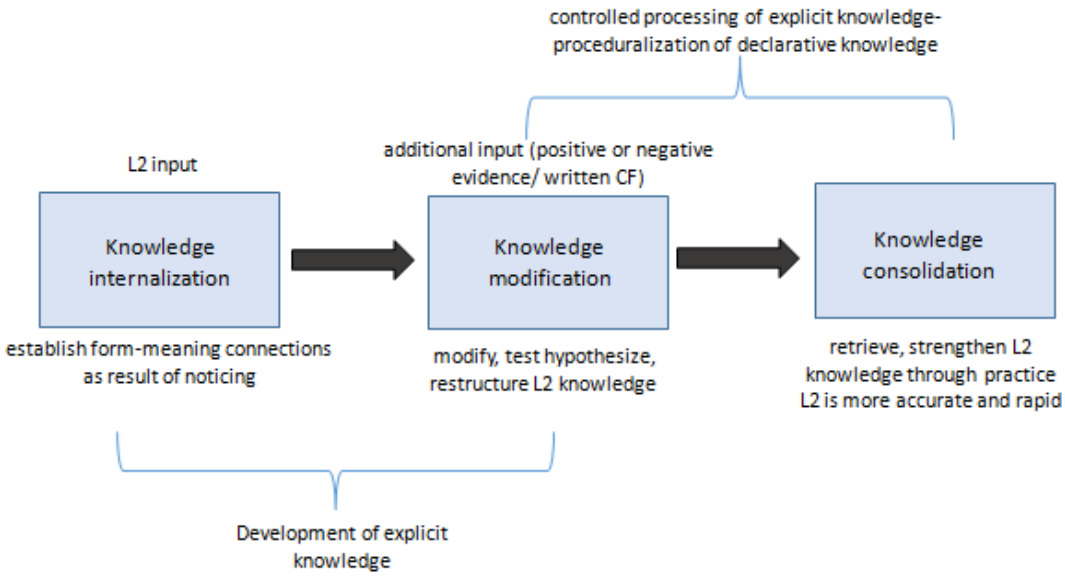

Figure 2.1: Three stages of L2 development produced from (Housen and Pierrard, 2005)

Errors might occur during the learners' attempt to establish form-meaning connections and hypothesis testing about L2 knowledge (Richards, 1971). Richards (1971, p.6) points out that learners sometimes generalize rules, apply incomplete rules or fail to apply accurate rules due to insufficient input processing. At early stages of learning, for example, learners know that 'er_than' is used for the comparative form. They often use these structures (e.g., shorter than, smaller than, younger than) in their everyday class language. Later, comparative rules are introduced formally (that students should add 'er_than' for adjectives of one syllable and 'more_than' for adjectives of two or more than two syllables), and thus they may be likely to over-generalize the rule of 'er_than' (e.g., 'A queen is beautifuler than a witch'). The overgeneralization here may happen because of strength of earlier priming and-or limited and insufficient input processing of the target linguistic structure (Richards, 1971). In this case, if the students receive written CF, it might support them to modify their old hypothesis, produce new hypothesis and restructure their L2 knowledge.

Errors become less frequent in the consolidation stage because of frequent practice (Dekeyser, 2007). However, errors might also occur in the consolidation stage when learners retrieve meaning-form connections with inadequate attention (Bitchener and Storch, 2016). For example, learners may know that they need to add 'er_than' to adjectives of one syllable and 'more_than' to adjectives of two or more than two syllables. But due to task time limit, complexity of the task, confusion and difficulty to retrieve information, they might mix up rules (add 'er_than' to adjectives of two or more syllables and 'more_than' to adjectives of one syllable). The provision of written CF here may facilitate the development of explicit knowledge by reactivating its controlled processing and contributing to knowledge consolidation.

Housen and Pierrard's (2005) model explains the way in which new L2 knowledge is generally developed and how written CF plays an important role in the development of explicit knowledge and knowledge consolidation. The next sub-section narrows down the discussion, as it explains the cognitive processing of a single written CF episode, drawing on Gass' (1997) computational model.

2.5 Cognitive processing of a single written CF episode

Written CF plays an important role in the development of explicit knowledge. Gass' (1997) computational model provides a clear picture of how L2 input-written CF is cognitively processed. Ellis (2008) describes Gass' (1997) model as the fullest, clearest representation of

the role of input in L2 acquisition (Ellis, 2008, p.268). Her model was basically used to address the oral production of knowledge, but can be used to address written production since it goes through similar cognitive processing (Bitchener and Storch, 2016), so the model is applicable to written CF cognitive processing, since providing written CF on learners' written production is a form of input, and the learners' responses to/corrections of their own errors based on their teachers' written CF is a form of output (Bitchener and Storch, 2016). Figure 2.2 (below) illustrates the six processing stages of a single written CF episode, drawing on Gass' (1997) Computational Model, adapted from (Bitchener and Storch, 2016).

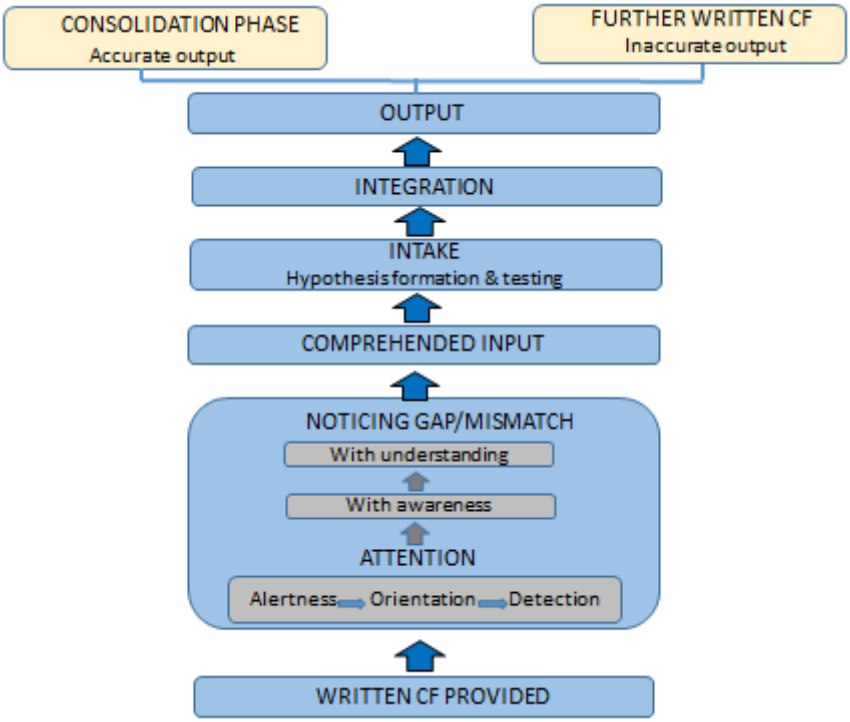

Figure 2.2: Stages of the cognitive processing of input-written CF

The model constitutes six stages:

1. Input-written CF
2. Noticing (attention)
3. Comprehended input-written CF
4. Intake
5. Integration
6. Output

These stages will be discussed in detail below with a focus on the factors that may determine the successful processing of written CF, such as the level of attention and existing knowledge.

Stage one: Input-written CF

The process starts when learners receive input in a form of negative evidence-written CF. There are different types of written CF, as mentioned in Chapter One. Written CF could be explicit, such as direct corrections, written meta-linguistic information or direct corrections, plus oral metalinguistic information, or implicit, such as underlining or error codes (Ellis, 2009).

Stage two: Noticing

In order to produce L2 output, learners first need to pay attention and notice that some input-written CF has been provided. Schmidt (1994, 2001) differentiates between three levels of attention: alertness, orientation and detection. Alertness is the first level and refers to learners' readiness and motivation to deal with the stimuli-input. Orientation means that learners direct their attention to a particular piece of data. Schmidt (2001) points out that successful orientation is based on a focus on both meaning and form. Detection is where learners cognitively register the input, allowing for further processing (Schmidt, 2001).

Bitchener and Storch (2016) suggest that written CF is explicit in nature, compared to oral feedback, so learners are more likely to notice and detect gaps. Schmidt (1995) asserts that 'noticing with awareness' (that new information has been added-written CF), and 'noticing with understanding' (having knowledge of the grammatical rules) are necessary for the effective processing of new L2 input (Schmidt, 1995). Noticing that some information has been added (written CF) and noticing the gap between the teachers' input and the learners' output-error alone are insufficient. Noticing with understanding is essential for the successful processing of written CF (Bitchener and Storch, 2016).

Stage three: Comprehended input- written CF

Comprehended input refers to whether or not the learners have actually comprehended the input/CF. Gass (1997) points out that input can be comprehended at the level of meaning where learners understand the general message, or at a deeper level, where learners analyse and understand the component parts and features of forms and structures (Gass, 1997, p.5).

When learners are provided with written CF, the extent to which it is comprehended may depend on how explicit the feedback is (Bitchener and Storch, 2016); for example, explicit types of feedback (e.g., direct corrections, direct corrections with oral metalinguistic information) may help learners to comprehend more clearly and fully than less explicit types (e.g., underlying errors), especially if the learners possess only partial or very limited existing knowledge about when and why a particular linguistic structure is required (Bitchener and Storch, 2016).

The L2 proficiency level of the learners and their existing knowledge may determine the extent to which the L2 input- written CF is comprehended (Bitchener and Storch, 2016). For low proficiency level learners and those with limited, partial existing knowledge, more explicit types of feedback may be more helpful, whereas high proficiency level learners may comprehend written CF of less explicit types, as they have better existing knowledge and retrieval experience (Bitchener and Storch, 2016). Once input-written CF has been comprehended, it is ready for the next stage: 'intake'.

Stage four: Intake

Intake occurs when information is matched against existing knowledge (Gass, 1997, p.5). It requires learners to match the input-written CF they have received with their existing knowledge; for example, 'more_beautiful than' is provided regarding the learners' incorrect comparative use of 'beautifuller than'. The learner may understand that 'er_than' cannot be used for all adjectives to form the comparative and that certain adjectives (longer words/those with two or more syllables) require the addition of 'more_than' instead to obtain the correct form. The learners match their new comprehended input with their existing knowledge about comparative rules and discover the difference between the two. During the matching process, the learner constructs a hypothesis about what is acceptable and unacceptable in L2 (Gass, 1997).

There are some individual factors that may mediate the learners' information processing. (Bitchener and Storch, 2016), as the learners' working memory, processing capacity, and language learning aptitude may play a critical role in the process of matching new input with their existing knowledge (Bitchener and Storch, 2016).

The term ‘working memory’ refers to 'a brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language comprehension, learning, and reasoning' (Baddeley, 1992, p.556). Bitchener and Storch (2016) explain that working memory is the site where new input is stored and integrated with information that is already encoded in the long-term memory and, therefore, where automatic and controlled cognitive processing occurs (e.g., attention, noticing, hypothesizing, restructuring, practice) (Bitchener and Storch, 2016, p.26).

Skehan (1998) explains that working memory is limited in capacity and requires conscious controlled effort, and that such limitation places a fundamental constraint on how the input is handled (Skehan, 1998, p. 44). It is expected that learners with a large working memory capacity are better at attending to and processing input (Skehan, 1998, p. 44).

Language learning aptitude is another factor that might mediate the cognitive processing of input (Ellis, 2008). Language learning aptitude includes: an ability in phonetic coding, grammatical sensitivity, rote learning ability and inductive learning ability (Ellis, 2008, p.654). Bitchener and Storch (2016) suggest that, because high level learners have a better working memory and processing capacity as well as a high language analytical ability, they may be more likely to notice a gap or mismatch between their output and the new CF input (notice with awareness and understanding). Low level learners, on the other hand, need to process new information (written CF) in a more consciously controlled way, so more effort and attention must be devoted in their working memory to noticing gaps, encoding linguistic structures and testing new hypotheses about new structures (Bitchener and Storch, 2016, p.27).

Stage five: Integration

Gass (1997, p.) explains four possible integration outcomes. The first possible outcome is that the hypothesis is confirmed. Learners may have created a hypothesis about a particular grammatical form and, once they are confronted with new input/written CF, they receive confirmation about their original hypothesis, which strengthens that grammatical knowledge. The second possible outcome is that the hypothesis is rejected. Learners might receive information/written CF that causes them to reject their original hypothesis, so the hypothesis is modified and awaits confirmation from further input/written CF (Gass, 1997, p.5).

In the case of both hypothesis conformation and hypothesis rejection, explicit L2 knowledge is developed (Gass, 1997). If the hypothesis is rejected, the learner has an opportunity to modify and create a new one, which will be tested by his new output (Gass, 1997, p.5). For example, when learners receive direct written CF such as 'A car is more expensive than a bicycle' regarding their incorrect use of 'A car is more expensiver than a bicycle.', which may be formed based on the incorrect hypothesis that 'er_than' should be added to all adjectives to form the comparative, they may need to reject their previous hypothesis and form a new one (e.g., that 'more' and 'er' should not be used in the same comparative sentence and/or that 'er' cannot be applied to all adjectives and/or that 'er_than' should not be applied to words of two or more syllables to form the comparative). The new hypothesis will be tested in their new output.

The third possible outcome is storage. In this case, the input is put in storage and not fully integrated into the learner's L2 system because of insufficient evidence from the input to create a hypothesis (Gass, 1997); for example, the learner produces an incorrect sentence, such as 'A car is expensive a bicycle' and receives direct written CF: 'A car is more expensive than a bicycle'. If the learner has no or very limited existing knowledge with which to create a hypothesis about the comparatives grammatical rules (such as, ‘for adjectives of two or more syllables, 'more_than' is used'), in this case, the learner will store this input/written CF. Later, when further input (e.g, more explicit types of written CF, such as meta-linguistic explanations of rules) is provided, the learner might form a new hypothesis (e.g., in the case of adjectives of two or more than two syllables, 'more_than should be added), but this newly-formed hypotheses may or may not be accurate (Gass, 1997). The new hypothesis is tested when further input/written CF is provided (Gass, 1997).

The fourth possible outcome is the non-use of input where learners make no use of input because they fail to comprehend it at a useful level (Gass, 1997, p.7). An example of this would be when a learner is provided with written CF, fails to comprehend it and repeats the same errors in subsequent writing. In this case, more episodes of written CF may be needed and more explicit types of written CF may be required in order for the learner to create an accurate hypothesis.

Stage six: Output

Output is the last stage in the cognitive processing of a single written CF episode. Gass (1997) describes this as 'an overt manifestation of the cognitive process' (Gass, 1997, p.7). Learners test their hypotheses in the output they produce, by receiving written CF, modifying their original hypothesis and producing new output (Gass, 1997). Swain (1985) points out that output forces syntactical analysis rather than solely semantic analysis, as learners are pushed to notice gaps and produce modified output. Swain (1985) refers to this as 'comprehensible output', as 'learners are pushed toward the delivery of a message that is not only conveyed, but that is conveyed precisely, coherently, and appropriately' (Swain, 1985, p.249).

However, learners sometimes fail to produce accurate modified output when developing L2 explicit knowledge. Gass (1997) points out that the integration of the input is not a one-off matter; learners analyse and reanalyse L2 input at different levels as they match it with their existing knowledge. As a result, they form a hypothesis about what is acceptable and what is unacceptable in L2. Based on this, the learners' current hypothesis may be confirmed or rejected and a new hypothesis is formed (which may be accurate or inaccurate), or the L2 input is stored until additional input is received or the learners do not use the input because they fail to comprehend it at a useful level (Gass, 1997, p.6-7).

Given these different possible outcomes, it is expected that, sometimes, learners will make no accuracy improvement immediately after a single episode of written CF. This might not mean that the learners are not benefitting from the input-written CF or that the written CF is not contributing to the development of explicit knowledge. Rather, the development of explicit L2 knowledge may be better captured after more than one or a series of written CF sessions (Bitchener and Storch, 2016). It might also indicate that different individual learners may benefit from different types of input-written CF (Nassaji, 2017).

The stages of the cognitive processing of a single episode of written CF are explained above. Throughout these stages, we see how certain factors, such as level of noticing and attention, learners' existing knowledge and learners' working memory and processing capacity, may play a role in the successful processing of written CF. The following sub-section 2.6 discusses other important factors that may moderate the effectiveness of written CF: the type of written CF, the type of linguistic error and the proficiency level of the learners.

2.6 Moderating factors of written CF

In the following sub-sections, there will be a theoretical discussion about the factors that may moderate the effectiveness of written CF.

2.6.1 The effectiveness of the different written CF strategies

Ellis (2009) classifies the strategies of written CF into six major categories (Ellis, 2009, p.98) (see Table 2.1 below):

Corrective Feedback Strategies	Description
1 Direct corrective feedback	The teacher provides the student with the correct form.
2 Indirect corrective feedback	
a. Indicating + locating the error	This takes the form of underlining and use of cursors to show omissions in the student's text.
b. Indication only	This takes the form of an indication in the margin that an error or errors have taken place in a line of text.
3 Meta-linguistic CF	The teacher provides some kind of meta-linguistic clue as to the nature of the error.
a. Use of error code	Teacher writes codes in the margin (e.g. ww = wrong word; art = article)
b. Brief grammatical descriptions	Teacher numbers errors in text and writes a grammatical description for each numbered error at the bottom of the text.
4 The focus of the feedback	This concerns whether the teacher attempts to correct all (or most) of the students' errors or selects one or two specific types of errors to correct. This distinction can be applied to each of the above options.
a. Unfocused CF	Unfocused CF is extensive.
b. Focused CF	Focused CF is intensive.
5 Electronic feedback	The teacher indicates an error and provides a hyperlink to a concordance file that provides examples of correct usage.
6 Reformulation	This consists of a native speaker's reworking of the students' entire text to make the language seem as native- like as possible while keeping the content of the original intact.

Table 2.1: Typology of written CF strategies (Ellis, 2009)

The different types of written CF vary in terms of their degree of explicitness; for example, direct CF, where errors are underlined and corrections are provided, is more explicit than indirect CF, where errors are underlined only or error codes are provided. Meanwhile, metalinguistic CF, where errors are highlighted and brief grammatical descriptions are provided, is more explicit than direct CF, where errors are highlighted and corrections provided. Written CF varies according to the scope of the focus; focused CF is when written CF targets a selective number of errors (linguistic structures), while unfocused CF is when the written CF is provided extensively for all types of errors (Ellis, 2009).

As mentioned in the previous sections, the learners' attention and existing knowledge play an important role in the cognitive processing of L2 input/written CF, so we might expect that different strategies of written CF will help learners to develop explicit L2 knowledge differently (Bitchener and Storch, 2016).

In this subsection, there will be a focus on the two types of written CF which are targeted in this study: direct written CF and indirect written CF. Each type will be defined and explanations of its theoretical potential regarding L2 development will be provided.

Direct written CF is when teachers provide the correct linguistic forms or structures by crossing out or underlining the error, or circling it and writing the correction above or near to the linguistic error (Bitchner and Knoch, 2010b, p. 209). It also includes the insertion of the missing elements in learners' writing (Bitchner and Knoch, 2010b, p. 209). An example of direct written CF, which is targeted in this study, is provided in Figure 2.3 (below).

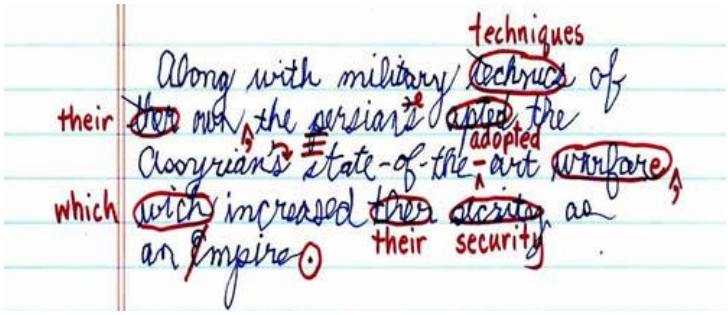

Figure 2.3: Direct written CF

Indirect written CF is defined as signalling or indicating that an error has occurred without providing a correction. The teacher locates errors by underlining or circling them and using

cursors for missing words but does not provide the corrections (Bitchner and Knoch, 2010b, p. 209). An example of indirect written CF, which is targeted in this study, is provided in Figure 2.4 (below):

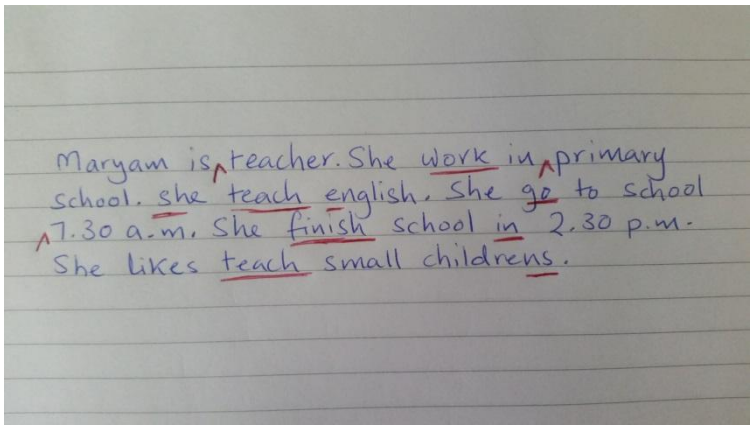

Figure 2.4: Indirect written CF

Direct and indirect written CF vary in terms of their degree of explicitness. Indirect CF by means of underlining errors without providing the correct form is less explicit than direct CF where errors are underlined and corrections are provided above them. In this thesis, these two types of written CF are investigated because they are the most common strategies used by Omani EFL teachers in Cycle Two Schools (grades 5-10). Some studies which were conducted in the Omani context found that 68% of the Omani students prefer direct written CF over indirect written CF (Al Ajmi, 2015, p. 66). Al Bakri (2015) found that teachers believe that it is their responsibility to provide direct corrections for their students. They believe that direct corrections help the students to avoid repeating same errors in future writing (Al Bakri, 2015, p.55). This study aims to find out if these two types of written CF (direct written CF and indirect written CF) are effective in developing the grammatical accuracy of young Omani students and whether this effectiveness varies because of their different degrees of explicitness.

There has been debate regarding which form of written CF best facilitates L2 development. For example, Lalande (1982) found that indirect CF was more effective than direct CF. He suggests that indirect CF requires learners to engage in 'guided learning and problem solving', and so promotes the type of reflection that fosters long-term acquisition (Lalande, 1982, p.140). Indirect CF has the potential to push learners to engage in hypothesis testing once the error has been noticed (Lalande, 1982, Ferris, 2002). This process induces deeper internal processing and promotes the internalization of the correct forms and linguistic structures

(Ferris, 2002). Indirect written CF is faster and easier, as the teachers underline the errors without writing the corrections (Ferris and Roberts, 2001). It also reduces the possibility that the teachers themselves will commit errors when writing the corrections (Ferris and Roberts, 2001, p.177). In studies by Ferris (2006) and Lalande, (1982), the indirect CF group outperformed the direct CF group in terms of improved accuracy over time.

However, some researcher believe that direct CF is more effective for learners than indirect CF. Bitchener and Knoch (2010b, p.209) point out that direct CF: 1) is more immediate and reduces confusion when students find it difficult to understand the feedback given, 2) provides learners with information that helps them to resolve complex errors, and 3) offers explicit feedback on a hypothesis that may have been made. Chandler (2003) argues that direct CF enables learners to internalize the correct form as, with indirect CF, learners do not know if their own hypothesized corrections are in fact accurate (Chandler, 2003, p. 291). It has also been claimed that with indirect written CF, learners might receive insufficient information to resolve their idiosyncratic errors or problems relating to complex grammatical rules (Van Beuningen et al, 2012, p. 7).

Ferris (2002) suggests that direct CF might be beneficial for improving short-term revisions of students, while indirect CF is better for long-term accuracy (e.g. Ferris, 2006). She points out that the effectiveness of direct and indirect written CF may be determined by certain factors, such as the proficiency level of the L2 learners (Ferris, 2010). Ferris (2010) and Bitchener (2012) suggest that high level learners might benefit more from indirect CF in both composition and language learning classes, while low level learners might not benefit from indirect CF due to their limited linguistic competence.

Some researchers see that the effectiveness of direct and indirect CF depends on the targeted errors; for example, Ferris (1999, p.6) points out that it is more beneficial to provide indirect CF for treatable errors (e.g. subject-verb agreement, articles, verb tenses and forms) which follow strong rules. With the less explicit type of feedback (indirect CF), learners are able to resolve their 'rule-governed' errors because they can refer to rules while untreatable errors (e.g. lexical errors, sentence structure, missing words, unnecessary words and word order) are idiosyncratic and so learners are required to utilize their acquired knowledge of the language to correct them. Therefore, learners are less likely to benefit from the indirect strategies of CF

(Ferris, 1999, p.6). She suggests that direct correction might be more beneficial for untreatable errors as it provides input for the acquisition of these errors (Ferris, 1999, p.6).

Recently, meta-linguistic written CF has attracted the attention of researchers, who see that a combination of direct plus written and/or oral metalinguistic written CF may facilitate L2 development more effectively than direct CF alone (Bitchener et al., 2005; Sheen, 2007). It is believed that it provides the information that learners need to form hypotheses, and it draws learners' conscious attention to the process of grammatical rules (Bitchener et al., 2005).

These theoretical arguments suggest that different strategies of written CF may contribute to the development of L2 in different ways. In the next sub-section, an explanation will be provided regarding the effect of different written CF strategies on the treatment of different types of L2 linguistic errors.

2.6.2 The effectiveness of different written CF strategies regarding the treatment of different types of linguistic errors

In order to assist learners in improving their writing, researchers have been keen to classify different types of writing errors. Early research classified writing errors into two general categories: global and local errors (Tran, 2013, p.3). Global errors are those that impede the comprehensibility of the text, while local errors are those which do not (Tran, 2013, p.3). The distinction between these two categories is not fixed and easily described, as one type of error may be a global error in one text and a local error in another, so the choice exclusively depends on how the teacher/reader interprets it (Tran 2013, p. 3).

Ferris (1999, p.6) provided another dichotomy of writing error types. She classified errors into 'treatable' and 'untreatable' errors. Bitchener et al. (2005) explain that:

"a distinction between 'treatable' and 'untreatable' errors, suggesting that the former (verb tense and form, subject-verb agreement, article usage, plural and possessive noun endings, and sentence fragments) occur in a rule-governed way, and so learners can be pointed to a grammar book or set of rules to resolve the error, while the latter (word choice errors, with the possible exception of some pronoun and preposition uses, and unidiomatic sentence structure, resulting from problems to do with word order and missing or unnecessary words)

are idiosyncratic and so require learners to utilize acquired knowledge of the language to correct the error" (Bitchener et al. 2005, p. 194).

Bitchener et al. (2005) described errors which follow strong rules as 'rule-governed' and those such as word choice and prepositions as ‘idiosyncratic’. Bitchener and Ferris (2012) referred to errors which follow rules as ‘rule-based’ and to others as ‘item-based’. Some errors, such as prepositions of space, have grammatical rules, but with some exceptions. The use of certain prepositions of space, at times, depends on the context (Guo, 2015). Prepositions of space could be described as ‘less rule-governed’ compared to other types of errors, such as verb forms and comparatives.

It has been suggested that learners might be better able to form correct hypotheses when receiving written CF on rule-governed errors and therefore better placed to produce accurate modified output in their subsequent writing (Bitchener and Storch, 2016; Guo, 2015). As with rule-governed errors, learners can reflect on and retrieve the rules from their long-term memory (Bitchener and Storch, 2016; Guo, 2015). With ‘item-based’ or ‘less-rule governed’ errors, meanwhile, learners may be less likely to form a correct hypothesis and, if they manage to do so, a correct hypothesis in one instance might not be useful in another (Bitchener and Storch, 2016; Guo, 2015), since prepositions of space are less-rule governed; that is, their rules are opaque and there exist many exceptions. An example of this is when the direct written CF 'A turtle is slow**er** than a rabbit' is provided regarding 'A turtle is slow than a rabbit'. Learners may form the hypothesis that 'er' should be added to produce the comparative form. Then, when learners wish to use the comparative form for 'cold, strong, tall' in subsequent writing, they may be able to benefit from their previous hypothesis and produce the correct form, 'colder than, stronger than, taller than', but the preposition of space 'in' is less-rule governed/because its rule has exceptions; for example, if the following examples are provided to learners: 'Sam is **in** the car…Tom is **in** the taxi.', a hypothesis might be formed by the learners that 'in' needs to be used with means of transportation, but this hypothesis may not benefit the learners when they wish to produce a sentence about someone 'on a bus' or 'on a train' . Another example is that written CF on a sentence such as ‘in a house’ might not help learners to produce the phrase ‘at home’. In this case, learners need to learn the preposition phrases in order to resolve their errors.

The effectiveness of different strategies of written CF may vary when treating rule-based/rule-governed and item-based/less-rule governed errors (Bitchener and Storch, 2016). Bitchener et al. (2005) point out that more explicit types of written CF (e.g. direct CF) may be more helpful for item-based, 'less rule-governed' errors, as students are less likely to benefit from referring to rules because rules have exceptions. Less explicit types of written CF (e.g. indirect CF), on the other hand, may be better applied to 'rule governed errors', as learners can refer to strong grammatical rules when resolving their errors (Bitchener et al., 2005).

2.6.3 Learners' proficiency level

Gass (1997) explains that existing knowledge plays an important role in cognitive processing because learners match the input/written CF against their existing knowledge. Loewen and Reindres (2011, p. 142) refer to proficiency as the learners' knowledge and ability to use the target language. It is an overall indicator of the learners' existing knowledge-linguistic competence (Loewen & Reinders, 2011; Van Beuningen et al., 2012).

An investigation of the influence of the learners' proficiency level on the effectiveness of written CF has both educational and theoretical implications (Van Beuningen et al., 2012). It is valuable for teachers to know if learners with different proficiency levels are equally receptive to direct and indirect written CF (Van Beuningen et al., 2012, 11). Theoretically, it has been claimed that indirect CF might be less helpful for lower proficiency level learners due to their insufficient existing knowledge (e.g., Ferris, 2004; Ferris, 2006; Hyland and Hyland, 2006), which may lead to expectations that higher proficiency level students might be better equipped with linguistic competence than lower proficiency ones, and so better able to use indirect written CF to develop their explicit L2 knowledge (Van Beuningen et al., 2012, p.33).

To summarize, this chapter provides an overview of the SLA theories and hypotheses that suggest a role for written CF in L2 learning and acquisition. The chapter explains how new L2 knowledge is developed within a cognitive processing framework. The role of written CF in developing explicit knowledge and L2 consolidation was highlighted. The chapter also explains how a single episode of written CF is cognitively processed, drawing on Gass' (1997) computational model. The model explains some of the cognitive factors that may determine successful written CF processing, such as level of attention, learners' existing

knowledge, language learning aptitude and learners' working memory and processing capacity. At the end of the chapter, some of the factors that may moderate the effectiveness of written CF were discussed, such as the type of written CF, the type of error and the proficiency level of the learners.

The next chapter starts by presenting an overview of the grammar correction debate in order to understand the claims that have been raised against and for the effectiveness of written CF in improving the grammatical accuracy of learners. Then, the chapter provides a review of the written CF research, focusing on research that targets direct and indirect CF. The review also discusses research focused on certain linguistic structures and also research that included the proficiency level of the learners as a variable. Since learners' response to written CF is examined in this study, the last section is devoted to research that investigated learners' uptake of written CF.

CHAPTER THREE
Review of Written CF Research

3.1 Introduction

Written CF is one of the controversial topics in the SLA literature. There has been a growing body of research on written CF since Truscott (1996) mounted a case against it. He claims that grammar correction does not have a positive effect on the development of L2 writing. This chapter will first review the theoretical, empirical and pedagogical points that Truscott (1996) raised against grammar correction. Then the research that examined the effectiveness of written CF in improving the grammatical accuracy of learners using a quasi-experimental design will be discussed. There will be a review of the early written CF research with a focus on the shortcomings identified by several researchers, and a discussion on how the recent written CF research, with more robust designs, provides evidence for the effectiveness of written CF.

Since this research targeted both direct and indirect written CF, there will be a focus on the quasi-experimental research that examined the relative effectiveness of these two types of written CF. The chapter will also discuss studies that targeted focused written CF that addressed specific types of linguistic structure. Some recent CF researchers have been interested in discovering whether the proficiency level of the learners moderates the effectiveness of written CF. Since this study included the proficiency level of the students as a variable, there will be a review of that research as well. Since this research also explores how students respond to direct and indirect written CF and whether they repair errors in response to these two types of written CF with understanding or without understanding, this chapter includes a discussion of the written CF research that examines the learners' uptake of written CF.

3.2 Error correction debate

The issue of written CF has been controversial and a strong debate has been on-going about whether it is effective or not in improving the written accuracy of learners. In fact, it has been of interest to researchers and teachers since Truscott (1996) mounted a case for its abolition. Truscott (1996) claims that grammar correction does not have a positive effect on the development of L2 writing accuracy, for different reasons. The following subsections will provide a discussion of the different empirical, theoretical, pedagogical and practical claims raised in the grammar correction debate.

A. Empirical Claims

Truscott points out that research on L1 grammar correction found that this practice had little or no effect on students' writing ability. Truscott (1996) claims that it would be foolish to assume, without strong evidence, that correction is useful in L2 learning. Truscott (1996) further argues that grammar correction is not only ineffective but also potentially harmful and a waste of time. He also suggests that the time and effort spent by teachers and learners in dealing with corrections would be better spent engaged in efficient alternative activities. Reviewing some of the early studies on written CF (e.g. Semke, 1984; Rob et al, 1986; Kepner, 1991; and Sheppard, 1992), Truscott (1996) concludes that the findings of these studies provide no evidence of the effectiveness of written CF in improving the accuracy of L2 learners.

Ferris (1999), on the other hand, in response to Truscott (1996), discusses in her article, "The case for grammar correction in L2 writing classes", that it is premature to conclude that grammar correction is ineffective and therefore should be abandoned (Truscott, 1996, p.328). Ferris (1999) comments that there was a flaw in Truscott's review of the previous research, which was "either under or overstated to suit his generalizations" (Ferris, 1999, p. 4). Moreover, Truscott ignored studies that contradicted him, particularly those of Fathman and Whalley (1990), and Lalande (1982). Truscott (1999) replies that in Fathman and Whalley's (1990) study, students were asked to revise their initial writing. Truscott (1999) argues that one cannot infer from their findings that students will be able to write more accurately in future writing. In Lalande's (1982), students received extensive corrections and were asked to rewrite their compositions. In his study, one group showed no significant changes in accuracy

and the other group declined in accuracy over time. Thus, Truscott (1999) argues that these studies do not provide evidence for the effectiveness of error correction.

Ferris (1999) continued with her argument that one cannot make generalizations because of diversity and dissimilarities in the early studies' design and methodology. For example, the L2 error correction studies cited by Truscott (1996) covered diverse groups of subjects and students, who varied widely in terms of both their origin and L1. Furthermore, the subjects were diverse, ranging from college level foreign language students to EFL learners or ESL learners. Truscott (1999) counters Ferris' criticism by arguing that generalization is most reasonable when similar results are obtained under a variety of conditions and least reasonable when the conditions are similar.

Ferris agrees with Truscott that, at that time, the evidence supporting the effectiveness of error correction was scant, limited, dated, incomplete and inconclusive, and therefore suggests that further research on grammar correction is needed.

B. Theoretical Claims

Truscott's (1996) argument against grammar correction was partially based on theoretical grounds. He specified three theoretical problems encountered by grammar correction. The first is order of acquisition. Research shows that L2 grammatical learning tends to follow a natural gradual order (Natural Order Hypothesis, Krashen, 1985). Therefore, problems can occur when the instructional sequences are inconsistent with those orders. Correction has little value when students are corrected on a point for which they are not yet ready (Truscott, 1996). He argues that, if teachers wish to help students through grammar correction, they must select the corrections on the basis of the student's current stage of development with respect to individual aspects of grammar. However, the reality is that this is not how grammar correction is done in L2 writing (Truscott, 1996). However, researchers see that this theoretical argument fails to account for situations in which the learner is 'ready' to acquire a new linguistic form-structure (Bitchener and Ferris, 2012).

The second problem related to grammar correction is 'pseudolearning' (Truscott, 1996, p. 345); that is, if new knowledge is not integrated into the learners' interlanguage and the learners are unable to use it, it is not real learning. Truscott (1996) explains that any proven benefits of grammar correction may be relevant to the development of explicit declarative

knowledge alone. Grammar correction never helps to develop implicit procedural knowledge, which is the ultimate goal of SLA (Truscott, 1996). Therefore corrective feedback produces a superficial and possibly transient form of knowledge, with little value regarding the actual use of the target language (Truscott, 1996). This view is supported by research that found that the learners acquired a good metalinguistic knowledge of the target language but were unable to use it (Truscott, 1996, p. 346). Based on follow-up tests and observations, the research also found that the knowledge which seemed to be acquired by the learners disappeared within months. He claims that, if the knowledge acquired through grammar correction is an instance of pseudolearning, teachers then have an additional reason to doubt the technique's value (Truscott, 1996, p. 345).

The third problem is that there is no single form of feedback that can be useful for different types of errors. Truscott (1996, p.343) claims that "there is some reason to think that syntactic, morphological, and lexical knowledge are acquired in different manners. If this is the case, then probably no single form of correction can be effective for all three". Ferris (1999, p. 6) states that Truscott ignored the fact that there are different strategies available for correcting the written errors of learners. She explains that different errors might benefit from different types of feedback, and proposes two types of errors: 'treatable' and 'untreatable' errors. She suggests that indirect feedback strategies might be more effective for 'treatable' errors (errors that follow strong grammatical rules, such as subject-verb agreement and verb forms) and direct feedback better for 'untreatable' errors (idiosyncratic errors, such as missing words, word order, word choice and certain types of prepositions) (Ferris, 1999, p.6).

C. Pedagogical and Practical Claims

Truscott (1996) continues his argument by pointing out that the same conclusion regarding the ineffectiveness of grammar correction can be reached on the basis of pedagogical and practical considerations. The practical reasons are related to second language teachers and students. The teachers sometimes fail to notice errors and, even if they do recognize them, some teachers are incapable of correcting them or providing the correct rules (Truscott, 1996). Truscott (1996) claimed that teachers' written CF is incomplete, inconsistent and inaccurate. Ferris (2006) sees that these claims are based on predictions and therefore provide no evidence for the view that written CF is ineffective. I think that these arguments cannot be generalized because some teachers are competent and committed in their written error treatment.

Truscott (1996) also claims that teachers who correct students' writing have serious problems with time and patience, which might affect the quality of their corrections. This might be the case if the teachers correct every single error. Researchers have suggested that teachers need to be selective in the feedback they provide (Bitchener, 2008). Selective feedback targets only a number of linguistic structures at a time (Bitchener, 2008). It has been argued that selective feedback has a positive effect on students' writing (Ferris, 1999; Ellis et al., 2008) and is more manageable for both students and teachers (Evans et al., 2010a). However, practitioners need to be careful about when and how to make feedback selective, as error 'fossilization' (Selinker, 1972) may be unavoidable if certain linguistic errors are neglected. Fossilization is a characteristic of learners' interlanguage (Selinker, 1972). It is a phenomena in which "a semi-developed linguistic form or construction shows permanent resistance to environmental influence and thus fails to progress towards the target" (Han, 2013, p. 133). Interlanguage is fossilized when incorrect linguistic features become a permanent part of how a second language learner speaks or writes and they become resistent to change despite continuous exposure to input and sufficient opportunity to practice the target language (Han, 2013).

In his discussion, Truscott (1996) adds that students may fail to understand the teacher's feedback because the teacher is unaware why the student made this particular error and what was going in the student's head that led to the error. Students who were able to revise their texts successfully might repeat the same errors in their subsequent writing. Truscott ignored the fact that written CF could be provided using different strategies and each strategy might have a different potential for developing L2 learners' grammatical accuracy (Ferris, 1999). Truscott (1996) continues that some research has found that certain students may be less motivated than others to respond to teachers' written CF. Bitchener and Storch (2016) suggest that individual differences always exist in L2 learning and, if there are some learners who are less motivated, there are also those who are neutral and highly motivated. In addition, Ferris (1999) suggests that teachers can raise their students' motivation about the importance of accuracy for developing writing.

Abundant evidence shows that students want correction and believe it is helpful. Truscott (1996) postulates that this does not mean that teachers should give it to them. When students have a false belief about learning, the proper response from the teachers is not to encourage that belief. Truscott continues that teachers need to educate students on the nature of the

learning process, on the non-value of correction and the harmful effects of correction (Truscott, 1996).

Nevertheless, the teachers continue to give written CF to their students because they believe that it plays a role in improving their writing (Ferris, 2002; Hyland and Hyland, 2006). Ferris (2004, 2011) points out that students expect written CF from their teachers and Chandler (2003) found that students dislike to be deprived of feedback on their errors. Research on teachers' beliefs about written CF found that the teachers value feedback and believe in its effectiveness in improving students' accuracy (e.g. Lee, 2009; Evans et al. 2010b). Moreover, the amount of empirical research which found positive results for written CF in improving the grammatical accuracy of L2 learners has increased since Truscott (1996) mounted a case against it. The debate on written CF continues, but the focus has changed from whether written CF is effective or not to whether some written CF strategies are more effective than others, whether some types of errors are more amenable to error correction than others and whether cognitive factors such as the learners' proficiency level play any moderating role in the effectiveness of written CF (Bitchener and Storch, 2016).

3.3 Quasi-experimental research

In this section, there will be a review of the quasi-experimental research that examined the effectiveness of written CF. The early written CF research will be discussed first, with a focus on its flaws that have been identified by some researchers. Then, there will be a review of the more recent written CF research to determine whether it addressed the shortcomings of the earlier research.

3.3.1 Early research of written CF (1980-2003)

Storch (2010), in her critical article on written CF, provided a summary of 11 early studies that focused primarily on whether written CF leads to improved accuracy. Some of these compared the influence of written CF and content commentaries on students' writing (e.g. Fazio, 2001; Fathman & Whalley, 1990; Kepner, 1991; Semke, 1984; Sheppard, 1992) or the differential effect of different types of written CF (e.g. Chandler, 2003; Ferris & Roberts, 2001; Robb et al., 1986; Lalande, 1982). Table 3.1 below provides a summary of the findings reported by these studies regarding whether written CF leads to improved grammatical accuracy, adapted from Storch (2010).

Study	Improved accuracy?
Chandler (2003)	Yes
Ferris & Roberts (2001)	Yes
Fazio (2001)	No
Ashwell (2000)	Yes
Polio et al. (1998)	No
Sheppard (1992)	Yes
Kepner (1991)	No
Fathman & Walley (1990)	Yes
Robb et al. (1986)	No
Semke (1984)	No
Lalande (1982)	Yes

Table 3.1: Early studies on written CF (adapted from Storch, 2010)

Despite the fact that some of these studies found that written CF was effective, a number of criticisms have been made against them in terms of their research design. The following provides a summary of the design flaws in these studies, identified by several researchers (Storch, 2010; Bitchener, 2008; Guenette, 2007; Truscott, 2007 and Ferris, 2004):

1. The lack of a control group

Most of these early studies did not include a control group in their quasi-experiments. The rationale of the studies for the lack of a control group might be that they think that a comparison between learners' performance before (pre-test) and after treatment (post-test) provides sufficient evidence for written CF's effect. There is broad agreement among the L2 written CF researchers (e.g. Storch (2010); Bitchener (2008); Guanette (2007); Truscott (2007) and Ferris (2004)) that studies without a control group do not provide evidence for the effectiveness of written CF. If we wish to know if written CF is effective, it is essential to have a group which receives written CF and a control group which does not, for comparison (Truscott, 2007). Truscott (2007) points out that, in the absence of a control group, one cannot ascertain whether the observed improvement resulted from the written CF or other factors (Truscott, 2007, p. 263).

The importance of a control group is emphasized by researchers in experimental and quasi-experimental studies; for example, Hudson and Liosa (2015) criticize quasi-experimental research that lacks a control group. They emphasize that, without a control group, one cannot

tell if the improvement or effect found in the experiment group is because of the treatment, until it is compared with the performance of a control group which received no treatment (Hudson and Liosa, 2015, p. 85).

2. A lack of new writing

Most of the early studies evaluated the students' improvement in accuracy using revised texts (Storch, 2010). In these studies, the learners were not asked to produce a new text. Truscott (1999, 2004, 2007) and Truscott and Hsu (2008) assert that the ability to revise does not provide adequate evidence that the written CF had a long-term learning effect or even that L2 learning has taken place. That is because, during revision, learners revise the same text. In the case of direct written CF, learners need simply to copy the corrections in their subsequent revision (Truscott and Hsu, 2008). Truscott and Hsu (2008, p.295) point out that evidence for the effectiveness of written CF should be taken from the students' performance of new writing.

3. Inappropriate writing tasks

Some of those studies used journals to provide written CF (e.g. Fazio, 2001; Kepner, 1991; Semke, 1984) (cited in Sorch, 2010). Storch (2010) points out that journals are usually used to encourage fluency. Therefore, they are unlikely to help students to focus on form. Furthermore, in some studies (e.g. Ashwell, 2000; Chandler, 2003; Sheppard, 1992), which used more appropriate writing tasks, the learners were asked to carry out the writing at home. Therefore it is difficult to determine with any degree of certainty the time spent on the task or whether the learners received any additional assistance (Storch, 2010, p. 33).

4. How the accuracy gains are measured

How the accuracy gains were measured is another shortcoming of the early research. Storch (2010, p. 33) explains that "to measure gains or lack in accuracy, we can only consider whether the errors in the initial text, and on which the learner received written CF, recur in the new text. Errors in the new text which did not appear in the learners' initial text cannot be included in measures of accuracy". This is only feasible if the feedback is focused on a limited range of errors in the same study, which is not the case for most early research. Bitchener (2008) and Sheen (2007) suggest that written CF should be focused and directed toward one or a limited number of error types.

5. Lack of comparability

Storch (2010), Guenette (2007) and Ferris (2004) point out that comparison between the early studies is problematic because they differed so much in terms of their key parameters:

5.1 Population

Storch (2010) points out that the early studies covered a diverse group of subjects. The students vary widely in terms of both their origin and L1. The subjects of the studies were college level ESL language students who were exposed to L2 outside the classroom (e.g. Ferris and Roberts, 2001; Polio et al., 1998), or EFL learners whose exposure to L2 is limited (e.g. Lalande, 1982 and Kepner, 1991). Most of the studies reported that the learners had an intermediate level L2 proficiency but some studies failed to define the proficiency level (e.g. Robb et al., 1986). Even where the proficiency level was mentioned, the proficiency measures employed were not clearly defined (Storch, 2010, p.34).

5.2 Treatment

There was a variation in treatment between the early studies as well (Storch, 2010). In some studies, feedback was provided on both grammar and content (e.g. Ashwell, 2000; Semke, 1984), while in others (e.g. Chandler, 2003; Robb et al., 1986), it was provided only on language use (Storch, 2010).

Another factor which makes the comparison between the studies difficult is that the feedback was sustained in some studies, where it was given on a number of pieces of writing over time (e.g. Chandler, 2003; Fazio, 2001), while in other studies, it was provided only once, on a single piece of writing (e.g. Ferris & Roberts, 2001; Fathman & Walley, 1990).

5.3 Grammatical accuracy measurement

The early studies also differed in terms of how they measured the grammatical accuracy (Storch, 2010); for example, Kepner (1991) used the mean number of errors, including morphological, vocabulary, and syntactic errors, while Lalande (1982) included errors in grammar and orthography (Storch, 2010). Other researchers used ratio measures such as error/ number of words (e.g. Chandler, 2003; Ferris & Roberts, 2001 and Ashwell, 2000) or the ratio of error free T-units to the total number of T-units (e.g. Robb et al, 1986; Polio et al., 1998) (Storch, 2010).

Ferris (1999, 204) points out that further investigations of grammar correction need to address the shortcomings of these early studies and produce better-designed written CF research.

3.3.2 Recent research on written CF (from 2005 onward)

Ferris (2004) concluded a review of the early research, calling for more robust and systematic research on the efficacy of written CF, which might explain the large number of studies conducted on the topic since 2005. Table 3.2 presents 17 recent studies on written CF. The table was developed from Storch (2010).

	Addressing research design flaws				**Addressing comparability issues**		
	Control group	**New writing**	**Writing task/ conditions**	**Accuracy gains**	**population**	**Treatment: type and duration**	**Accuracy measures**
Guo (2015)	Yes	Yes	Picture description (40 minutes)	Yes (focused WCF)	First year non-English major students (age 18-20) Pre-intermediate level	Focused (regular and irregular simple past tense and prepositions of space) Underlining, error code, metalinguistic explanation, direct correction, direct correction plus metalinguistic explanation One shot	% correct usage in obligatory context
Shintani et al. (2014)	Yes	Yes	Dictogloss passages (20 min)	Yes (focused WCF)	First and second year university L2 learners, pre-intermediate, Japan	Focused (English indefinite articles + hypothetical conditional)) One shot	% correct usage in obligatory context
Shintani & Ellis (2013)	Yes	Yes	Picture composition, narratives (20 min)	Yes (focused WCF)	ESL learners, Low intermediate, Intensive Language program. USA	Focused (English indefinite articles) One shot	% correct usage in obligatory context
Van Beuningen et al. (2012)	Yes	Yes	Picture writing Biology related topics	No (unfocused WCF)	Learners at four Dutch secondary schools	Unfocused One shot	Error/total no. of words
Bitchener & Knoch (2010a)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL, Low intermediate students, Auckland, New Zealand	Focused (English articles) Sustained	% correct usage in obligatory context
Bitchener & Knoch (2010b)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL, advanced L2 writers, university, USA	Focused (English articles) One shot	% correct usage in obligatory context

Hartshorn etl al. (2010)	No	Yes	Short essays (different topics/genres) (10 min)	No (unfocused WCF)	ESL Low to mid advanced English Language Centre, adults USA	Unfocused Indirect (+ error codes) vs. Direct Sustained	EFT/ T
Bitchener & Knoch (2009a)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL low intermediate English Language De., University NZ	Focused (articles) Direct (+ - explanation) One shot	% correct usage in obligatory context
Bitchener & Knoch (2009b)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL low intermediate English Language De., University NZ	Focused (articles) Direct (+ - explanation) One shot	% correct usage in obligatory context
Sheen et al. (2009)	Yes	Yes	Narrative (based on a reading) (15-20 min)	Yes (focused WCF)	ESL intermediate Pre- academic ESL, USA	Focused vs. Unfocused Direct One shot	% correct usage in obligatory context
Ellis et al. (2008)	Yes	Yes	Narratives (based on reading) In class (untimed)	Yes (focused WCF)	EFL university, Japan	Focused vs. Unfocused Direct Sustained	% correct usage in obligatory context
Bitchener (2008)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL low intermediate (Language school (adults) New Zealand	Focused (articles) Direct (+ - explanation) One shot	% correct usage in obligatory context
Bitchener & Knoch (2008)	Yes	Yes	Picture description (30 min)	Yes (focused WCF)	ESL low intermediate (Language school (adults) New Zeland	Focused (articles) Direct (+ - explanation) One shot	% correct usage in obligatory context
Truscott & Hsu (2008)	Yes	Yes	Narrative based on pictures (30 min)	No (unfocused WCF)	EFL High intermediate, University, Taiwan	Unfocused Indirect One shot	Error/total no. of words
Van Beuningen et al. (2008)	Yes	Yes	Email explaining a topic using a set of pictures (20 min)	No (unfocused WCF)	L2 learners of Dutch High School, Holland	Unfocused Direct vs. Indirect One shot	Errors/total no. of words
Sheen (2007)	Yes	Yes	Narrative (based on a reading) (12 min)	Yes (focused WCF)	ESL Intermediate Community College, USA	Focused (articles) Direct Direct + written metalinguistic One shot	% correct usage in obligatory context
Bitchener et al. (2005)	Yes	Yes	Setter (45 min) (e.g. The student writes an informal letter to a friend about what he/she did since that friend left the country and what activities they will do if the friend comes back.)	Yes (focused WCF)	ESL post intermediate Language School (adults), NZ	Focused (3 structures), Direct (+ - explanation) Sustained	% correct usage in obligatory context

Table 3.2: Written CF research from 2005 onward (developed from Storch, 2010)

Most of the recent studies seem to have successfully addressed the flaws in the research design identified in the early research (Storch, 2010). All of them included control groups (except for Hartshorn et al. (2010)), and all of the written CF provided to L2 learners was focused (except for Hartshorn et al. (2010), Truscott and Hsu (2008) and Van Beuningen et al. (2008, 2012)). Furthermore, all of the studies included a new piece of writing and a range of authentic writing tasks was used, to be completed under timed conditions (Storch, 2010).

The comparability parameters of these studies show that the populations vary somewhat (Storch, 2010). Most are ESL adult L2 learners and of intermediate proficiency. The term "intermediate" is not always clearly defined (Storch, 2010). The treatment in many of these studies was uniform in the sense that feedback was provided on a single piece of writing, as a 'one shot', followed by immediate and delayed post-test (Storch, 2010).

Regarding the question of whether these studies produced more conclusive results about the efficacy of written CF, the majority of them provide evidence of a positive and significant effect for written CF. However, in terms of the efficacy of particular types of written CF, the research evidence remains inconclusive. Studies investigating the different types of written CF (e.g. focused versus unfocused, direct versus indirect and the relative effect of these different types) produced mixed, contradictory results.

3.4 Direct versus indirect written CF studies

A limited number of studies have investigated whether direct or indirect corrective feedback is more facilitative of improved accuracy in L2 writing. Table 3.3 (below) shows the research (from 1980 onward) that compares the effectiveness of direct versus indirect written CF. It was developed from Bitchener (2008).

Study	Participants	WCF types	Duration	Most effective
Nematzadeh and Siahpoosh (2017)	Intermediate Iranian foreign language learners	Focused (1)Direct CF (2)Indirect CF (3)control group	10 sessions	No statistical significant difference between direct CF and indirect CF
Eslami (2014)	Low-intermediate EFL students	Focused (1)Direct correction (2)Indirect CF	2 shots	Indirect CF group outperformed the direct CF group in the immediate post-test and delayed post-test
Hosseiny (2014)	Pre-intermediate students in Iranian institute	Focused (1)Direct CF (2)Indirect CF (3)Control group	5 sessions	No statistical significant difference between direct CF and indirect CF
Mubarak (2013)	College students at University of Bahrain	Unfocused (1)Direct CF (2)Indirect CF (3)Control group	One shot	No statistical significant difference between direct CF and indirect CF
Van Beuningen et al. (2012)	Learners at four Dutch secondary schools	Unfocused (1)Direct CF (2) Indirect CF (3) 2 control	6 weeks	Equal effectiveness in revision Direct only in grammatical accuracy in new pieces of writing Indirect CF in non-grammatical accuracy in new

		group (self-correction & additional writing practice)		pieces of writing
Bitchener & Knoch (2010b)	ESL, advanced L2 writers, university, USA	(1)Written metalinguistic explanation (2)Indirect circling of errors (3) Written metalinguistic feedback and oral form-focused instruction (4) Control group	10 weeks	No difference between the three treatment groups Indirect feedback did not sustain improvement in the delayed- post test
Van Beuningen et al. (2008)	L2 learners of Dutch High School, Holland	Unfocused (1)Direct CF (2) Indirect CF (3)2 control groups (self-correction & additional writing practice)	One shot	Direct CF & indirect CF equal on revised texts Direct CF only on new texts
Chandler (2003)	31 ESL learners Hong Kong	(1)Direct correction only (2)Underlining with error codes (3)Error codes only (4)Underlining only	1 semester	Direct correction and underlining were more effective than error codes
Robb et al. (1986)	134 EFL learners Japan college	(1)Direct correction (2)Indirect coded feedback (3)Indirect highlighted feedback (no codes) (4)Indirect marginal feedback	1 year (34.5 contact hours)	No significant difference
Semke (1984)	141 German learners USA university	(1)Comments (2)Direct corrections (3)Direct corrections and comments (4)Indirect (coded) correction	10 weeks	No significant difference
Lalande (1982)	60 German FL learners (intermediate) USA university	(1) Direct error correction (2) Indirect coding and error logs kept	10 weeks	Indirect

Table 3.3: Research on direct versus indirect written CF

Both the early and recent research on the effectiveness of direct versus indirect feedback has produced conflicting, mixed results. Some studies found that there was no significant difference between direct and indirect CF (e.g. Nematzadeh and Siahpoosh, 2017; Hosseiny, 2014; Mubarak, 2013; Chandler, 2003; Robb et al., 1986; Semke, 1984), others found that indirect CF was more effective than direct CF (e.g. Eslami, 2014; Lalande, 1982), while yet others reported an advantage of direct written CF (e.g. Van Beuningen, 2008, 2012; Bitchener and Knoch, 2010b). These studies will be explained in more detail below.

3.4.1 Studies with no significant difference between direct CF and indirect CF

Semke (1984) conducted a ten-week study involving 141 first-year German students to examine the effectiveness of four types of written CF: 1) writing comments only, 2) direct corrections only, 3) comments and direct corrections and 4) codes. Semke (1984) found no significant difference between the treatment groups: direct corrections only, comments only, direct corrections with comments and error codes. Guenette (2007, p.48-49) points out that the groups in Semke's study were treated differently, explaining that the direct group received direct corrections and was asked to rewrite their essay whereas the error codes group was asked to self-correct and submit a rewrite a week later. In this case, the error codes group produced a new essay while the direct corrections group produced only a revision of their initial essay. Therefore, the latter group produced half as much new writing as the error codes group. Because the amount of writing produced by the two groups differed, it is difficult to trace the effect of direct versus indirect correction in Semke's (1984) study (Guenette, 2007, p. 49). This study warns researchers about a flaw that might arise in some quasi-experimental written CF research. To avoid producing obscure results regarding the relative effectiveness of the different strategies of written CF (direct versus indirect), learners must receive the same quantity of writing.

Robb at al. (1986) conducted a study on the relative effectiveness of the different types of written CF among 134 Japanese college learners. They examined four different types of written CF on form; direct correction, coded CF, encoded CF where the location of errors is only specified, and marginal feedback, where the number of errors per line was totaled in the margin. These four types of written CF differed in terms of their degree of salience. The students attended 23 sessions and received CF on five compositions each. Their study showed no significant differences in the measures of accuracy and influence between these types of written CF. Guenette (2007, p. 49) comments that the classroom context should be considered when explaining Robb et al.'s findings. In their study, the students received classroom instruction where the focus was on grammatical structures, and so were perhaps highly attentive to form, whether or not they received written CF.

Mubarak (2013) examined the effectiveness of direct and indirect written CF on Bahrain students' writing accuracy and complexity. He targeted grammatical errors, such as verb tenses, prepositions and auxiliaries, subject verb agreement and articles, as well as lexical errors, such as wrong word choice and missing words. Mubarak concluded that no effect of

either feedback type on the students' writing was found. He attributed his findings to factors such as the duration of the treatment and the proficiency level of the students. He claimed that ten weeks of treatment might be insufficient to help the students to improve their grammatical accuracy and the complexity of their writing, especially as his study targeted comprehensive types of written CF. Another possible reason for finding no significant effect for direct or indirect written CF is that most of the students involved in his study had a low level of proficiency in English, which might explain why they were unable to benefit from the written CF (Mubarak, 2013, p. 174).

It seems that Mubarak's conclusion regarding the relationship between low level proficiency students and the lack of written CF's effectiveness in his study makes sense. Researchers believe that the proficiency level of the learners may moderate the effectiveness of written CF (e.g. Bitchener and Storch, 2016; Bitchener and Ferris, 2012). Because high level proficiency L2 learners have better existing knowledge and analytic ability, better working memory and processing capacity, they might benefit more from written CF than low proficiency level learners (Bitchener and Storch, 2016). Several studies (e.g. Bitchener and Knoch, 2010b; Bitchener, 2008) that targeted advanced and intermediate learners found written CF to be effective. The results of these studies might provide some evidence that written CF is effective for advanced and intermediate learners. However, research that examined the moderating role of L2 learners' proficiency level on the effectiveness of written CF in a single study (e.g. Van Beuningen et al., 2012; Guo, 2015) is scarce, as we will see in the coming sections. I suggest that further investigation of this variable in a single study is needed to explore why some learners may fail to benefit from some types of written CF, as this study aims to examine.

Hosseiny (2014) examined the relative effectiveness of direct and indirect written CF in improving the grammatical accuracy of definite and indefinite article use among pre-intermediate level Iranian students. He found that both the direct and indirect written CF groups outperformed the control group, but there was no statistically significant difference between the two types of written CF. A similar result was found in a recent study by Nematzadeh and Siahpoosh (2017), who examined the effectiveness of direct correction and indirect (underlining) written CF in improving the grammatical accuracy of intermediate Iranian EFL learners in revising the use of English articles, prepositions and verb tenses. They found that both types of written CF enhanced the learners' performance in writing and

that no statistically significant difference was found between direct correction and the underlining of errors.

The lack of a significant difference between direct and indirect written CF in Hosseiny (2014) and Nematzadeh and Siahpoosh's (2017) studies might be attributed to the same reason why Robb et al.'s (1986) study found no significant difference between the two types of written CF. In Hosseiny (2014) and Nematzadeh and Siahpoosh's (2017) studies, the students received comprehensive classroom instruction on the targeted linguistic structures. In the former study, the students received five sessions of instruction, where the students performed 22 tests and filled in 40 blanks in each session regarding the use of English articles while, in the latter, study, the treatment continued for ten sessions, with a focus on certain linguistic structures as well. The students may become highly attentive to the forms targeted in their studies, which may explain why whether the students received direct CF or indirect CF made no significant difference.

The classroom instruction may provide the students with extra practice on these linguistic structures in these studies. These three studies (Nematzadeh and Siahpoosh, 2017; Hosseiny's, 2014; Robb et al., 1986) warn us that the extensive instruction on the targeted linguistic structures may complicate the issue of finding any significant difference between the effect of direct and indirect CF. Because of this, I was cautious about this point. In the current study, the students received only one session of instruction on the targeted linguistic structures, a week prior to the pre-test. I provided instruction because the targeted linguistic structures (comparatives and prepositions of space) had not yet been introduced to the students.

3.4.2 Studies that found an advantage regarding the use of indirect CF

Some written CF researchers, who examined the effects of direct and indirect written CF, have reported that indirect written CF helped learners to improve their accuracy over time more than direct written CF; For example, Lalande (1982) examined the relative effectiveness of direct corrections and error codes in improving the grammatical accuracy of intermediate college learners of German. Lalande (1982) reported that the group which received error codes performed better than that which received direct corrections. Lalande (1982, p.145) explained that the results of his study indicated that the combination of error awareness and problem-solving techniques had a significant beneficial effect on the development of writing. Indirect written CF is preferable because it engages learners in

guided learning and problem-solving, which leads to the reflection that may foster long-term acquisition (Lalande, 1982, p.140). Corder (1967, p.168) states that "simple provision of the correct form may not always be the only, or indeed the most effective, form of correction: making a learner try to discover the right form could be more often instructive to both learner and teacher".

Truscott (1996) points out that one of the weaknesses of Lalande's (1982) study is that it failed to include a control group, so the effects of correction versus non-correction could not be compared. Van Beuningen et al. (2012, p.7) comment that the two treatment groups in Lalande's study (1982) differed, in that "the indirect group was engaged in more form-focused activities than the group receiving direct CF". I think that this is an essential point as, in quasi-experimental studies aiming to detect a significant difference between the two different treatments, it is vital to control any variables that may affect the results. In both treatments (direct CF and indirect CF), learners must receive the same type and amount of writing, or the results will be questionable. Considering this issue in the current study, both the direct and indirect groups, as well as the control group, received the same type and quantity of writing.

Eslami (2014) also found an advantage for using indirect CF over direct CF. In her study, she examined the relative effectiveness of direct and indirect CF in improving the grammatical accuracy of low-intermediate EFL students in Iran by means of pre-test, immediate post-test and delayed post-test. She targeted simple past tense errors, and found that the indirect CF group outperformed the direct CF group on both the immediate post-test and the delayed post-test. She concluded that indirect CF has a longer-term effect than direct correction. However, this study could be criticized for its failure to include a control group. Therefore, both the studies of Lalande (1982) and Eslami (2014) were criticized for failing to include a control group, and so do not provide strong evidence for the effectiveness of indirect written CF.

3.4.3 Studies that found an advantage regarding the use of direct CF

Chandler's (2003) study examined the relative effectiveness of different types of written CF: 1) direct error correction, 2) underlining with error codes, 3) error codes only, and 4) underlining only. She targeted 20 intermediate ESL learners. Although there was no significant difference between the direct and indirect written CF, Chandler (2003, p.285)

reported that the students made significantly fewer errors in their revision when they received direct corrections, and also preferred direct correction because it was the easiest and fastest way to learn. She pointed out that the students better internalized the correct forms when they saw their errors corrected soon after writing.

Studies by Bitchener & Knoch (2010b) and Van Beuningen et al. (2008, 2012) found a long-term advantage for direct written CF. Bitchener and Knoch (2010b) examined the relative effectiveness of three types of written CF: 1) written metalinguistic explanation, 2) indirect circling of errors, and 3) written metalinguistic feedback, and oral form-focused instruction. They examined the relative effectiveness of these strategies of written CF on improving the grammatical accuracy of 12 advanced learners regarding the use of English articles. The learners received three tests (a pre-test, immediate post-test and delayed post-test) where they were asked to describe a picture of a different social setting. They found that all of the treatment groups (the indirect CF group and the two direct CF groups) outperformed the control group in the immediate post-test. After 10 weeks, the level of improvement was only retained by the two direct groups, and not the indirect group. Bitchenr and Knoch (2010b) conclude that the metalinguistic explanation is more beneficial because it identifies the type of error, provides learners with explanations about why the error has occurred and includes examples of correct usage. Indirect written CF, on the other hand, only identifies where an error has occurred (Bitchener and Knoch, 2010b, p. 215).

In their pilot study, Van Beuningen et al. (2008) produced similar findings to Bitchener and Knoch (2010b). Van Beuningen et al. (2008) examined the relative effectiveness of direct and indirect written CF on improving the grammatical accuracy of 62 Dutch secondary school students. The students were assigned to two treatment groups: 1) a group that received direct corrections, and 2) a group that received the underlining of errors plus codes. Two control groups were included: 1) a practicing writing group (a control group that received writing practice only without written CF), and 2) a revision without feedback group (a control group that revised their pre-tests but without receiving written CF). The study reported short-term effects on revision for both types of written CF but long-term effects on new writing for the direct written CF group only. They argue that the students who received direct CF could instantly internalize the correct form, but that the students who revised their texts based on indirect CF were unable to do so, since they did not know whether their own hypothesized correction was indeed accurate (Van Beuningen et al., 2008).

In their second study, which involved a larger sample size (n=134), Van Beuningen et al. (2012) found that both direct and indirect comprehensive CF improved the accuracy of the learners' revision and new writing. The learners benefited more from direct written CF in terms of improving their grammatical errors (e.g., articles, inflectional errors and word order errors) and more from indirect written CF in terms of improving their non-grammatical accuracy (e.g. lexical errors and orthographical errors).

Reflecting on studies that found an advantage for direct correction, Bitchener and Storch (2016, p.46) point out that Chandlers' (2003) study could not be compared with other studies that targeted direct and indirect written CF because the learners received consecutive treatments rather than one treatment.

Although the studies of Van Beuningen et al. (2008, 2012) and Bitchener and Knoch (2010b) both found that direct feedback was more influential over time with regard to the acquisition of grammatical structures, a conclusion in favour of direct CF from the three studies cannot be drawn. This is because Van Beuningen et al. (2008, 2012) examined comprehensive written CF while Bitchener and Knoch (2010b) focused on only one linguistic structure (English articles). Bitchener (2012) points out that studies examining the relative effectiveness of direct and indirect written CF should examine whether other, different types of linguistic errors are more responsive to direct CF than to indirect CF.

To summarise the findings of the direct versus indirect written CF research, to date, there exist conflicting results. Some research has found no significant difference between the two strategies, other research favors direct CF and yet other research supports indirect CF. Ferris (2010) and Bitchener (2012) point out that the studies which examined the relative effectiveness of direct written CF and indirect written CF vary widely in terms of the targeted error types, the language teaching and learning context, the amount of treatment and the proficiency level of the learners. These variations might explain the conflicting results existing within the direct and indirect written CF research (Bitchener, 2012).

3.5 Revision studies

Some of the early research examined the effectiveness of written CF on providing L2 learners with feedback that would enable them to revise their writing. These studies (Ashwell, 2000; Fathman and Whalley, 1990; Ferris and Roberts, 2001) were conducted in writing classes where the focus was on helping learners to improve the accuracy of their drafts. The

researchers found that written CF was effective for text revision and that learning was demonstrated through the accurate revision of an original text.

Truscott (2007) argues that 'A writing task that students do with help from the teacher (the revision) is obviously not comparable to one they do on their own (the original essay) and so a study with this design does not yield any measure of learning, short-term or otherwise' (Truscott, 2007, p.257). Truscott and Hsu (2008, p.295) suggest that, to determine that success during revision is a genuine indicator of learning, it is necessary to look at the learners' performance during a new writing task that was received subsequent to the revision.

Three studies (Truscott and Hsu, 2008; Van Beuningen et al., 2008, 2012) examined the potential of text revision in predicting learning via post-tests. All three studies found that learners who received written CF made significantly fewer errors in their revisions than the learners in the control group; however, the results of these studies conflicted with respect to the role of written CF in learning. Van Beuningen et al. (2008, 2012) found that written CF led to improved accuracy within text revision and this was followed by a learning effect with regard to new texts. Truscott and Hsu (2008) reported that the accuracy improvement in their treatment group during revision did not lead to improved accuracy in the writing of new text. They concluded that successful error reduction during revision is not a predictor of learning and that written CF might have some limited, short-term value (editing) but is not useful as a learning tool (Truscott and Hsu, 2008, p. 299).

Based on the limited number and conflicting findings of the revision studies, a conclusion regarding the contribution of text revision to L2 learning cannot be drawn. Nonetheless, text revision is a practice employed by many L2 teachers, and so it is worth examining if it facilitates L2 learning (Bitchener and Ferris, 2012). The current study aims to contribute to the written CF research by examining whether written CF is effective for revision and whether a reduction in errors in revision predicts any learning in new writing. Previous studies which focused on the effectiveness of direct and indirect written CF in both revision and new writing targeted comprehensive errors (e.g. Van Beuningen, 2008, 2012; Truscott and Hsu, 2008). The merit of the current study is that it is highly focused, whereby two linguistic structures are targeted. In addition, these two linguistic structures differ in terms of their complexity: comparatives are rule-governed while prepositions of space are less rule-

governed. Therefore, this allowed a comparison of the findings across the two different linguistic structures.

3.6 Focused written CF studies

Bitchener (2009a) suggests that one reason for the failure of the early studies to draw conclusions about the efficiency of written CF was the unfocused approach adopted regarding the range of error categories treated. Some of these studies included up to 15 error categories, which is likely to produce so much cognitive overload that learners would be unable to attend to the CF (Bitchener, 2009a, p.204).

Van Beuningen et al. (2012) argue that unfocused written CF corresponds to actual teaching practice, as most teachers prefer to provide comprehensive error correction to their students. In contrast, Shintani et al. (2014) point out that focused written CF provides learners with more opportunities to restructure their interlanguage system (when learners receive repeated evidence regarding how to correct the same type of error). To make the feedback more practical, Shintani and Ellis (2013) suggest that teachers can switch the focus of their correction in different pieces of writing; for example, if teachers provide their students with some writing where the focus is on practising certain linguistic structures, the teachers may then focus on these linguistic structures in their written CF. If the aim of writing is to communicate with others, the teacher may focus more on content and communicative errors, that may hinder comprehension. Some teachers may decide to provide written CF on the most common and frequent errors committed by their students.

From a theoretical perspective, researchers (Schmidt, 1994 and Ellis, 2005) highlight the importance of 'attention' and 'understanding' in the cognitive theories of SLA. This suggests that providing focused written CF helps learners to 'attend' to feedback and 'understand' the nature of the error and how to correct it (Ellis et al., 2008). Shintani et al. (2012) point out that one form-structure may be more difficult to learn than another and that different structures may be acquired at different stages, which might explain why focused written CF is potentially a valuable tool. Most recent studies have investigated the effectiveness of written CF, focusing on only one or a few targeted linguistic errors. Ellis et al. (2008) categorized these as 'highly focused' feedback, where written CF is provided on one category of error only and 'less focused CF', where the written CF is restricted to a limited number of targeted error types (Ellis et al., 2008, p.356).

Table 3.4 (below) is developed from Bitchener and Storch (2016) and lists the written CF studies that have focused on specific linguistic categories:

Studies	**Linguistic focus**	**Findings**
Guo (2015)	Regular and irregular past tense; prepositions indicating space	Effective for irregular past tense but not over time
Shintani et al. (2014)	Indefinite article and hypothetical conditional	Not effective for indefinite article. Effective for hypothetical conditional but not over time
Rummel (2014)	Simple past tense and present perfect tense	Effective for both
Hosseiny (2014)	Definite and indefinite articles	Effective for both
Stefanou (2014)	Articles with generic and specific plural referents	Effective for both
Shintani and Ellis (2013)	Indefinite article	Effective in immediate post-test but not over two weeks
Frear (2012)	Regular and irregular verb forms	Effective for regular but not irregular forms
Bitchener (2008 Bitchener and Knoch (2008, 2009b, 2010a, 2010b)	Indefinite article 'a' for first mention and definite article 'the' for subsequent or anaphoric mentions	Effective for both
Sheen (2007)	Indefinite article 'a' for first mention and definite article 'the' for subsequent or anaphoric mentions	Effective for both
Bitchenr et al. (2005)	English articles, past simple tense, prepositions	Effective for articles and past simple tense

Table 3.4: Written CF research that targeted focused linguistic errors

Most of the published written CF research has focused on investigating English articles (Bitchener et al., 2005, Bitchener, 2008; Bitchener and Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007; Shintani and Ellis, 2013; Shintani et al., 2014; Stefanou, 2014, Hosseieny, 2014). Bitchener et al. (2005) investigated the effect of written CF on English articles, the past simple tense and prepositions over 12 weeks and found that it was effective in helping learners to improve their accuracy regarding the use of articles and the simple past tense but not prepositions.

Other studies (Bitchener and Knoch, 2008; Sheen, 2007; Ellis et al., 2008) also found that written CF is effective for both functional uses of the English article system. Bitchener (2008) and Bitchener and Knoch (2008, 2009b, 2010a, 2010b) investigated the two most frequent functional uses of the English article; the use of the indefinite article of 'a/an' for the first mention, and the use of the definite article 'the' for subsequent or anaphoric mentions. Both studies found that written CF is effective in improving learners' accuracy regarding using articles for both functions, for intermediate, low intermediate and advanced learners.

Ellis et al. (2008) and Sheen (2007) also found that written CF is effective for targeting these two functional uses of the English article.

In more recent studies, by Shintani and Ellis (2013) and Shintani et al. (2014), the researchers focused on one functional use of the article system: the use of the indefinite article 'a' for the first mention. They argue that 'restricting the analysis to 'a' for first mention allows for a more reliable scoring of the effect of instruction on acquisition' (Shintani and Ellis, 2013, p.292). They point out that, because learners have a tendency to overgeneralise the use of the definite article, it is difficult to determine, from previous studies (that targeted both functional uses of the article system), whether they had acquired the definite article for specific grammatical functions.

Both of the studies of Shintani and Ellis (2013) and Shintani et al. (2014) found that written CF failed to help the learners to improve their use of the indefinite article over time. Shintani and Ellis (2013) found that the provision of metalinguistic explanations produced improved accuracy in the immediate post-test only but not in the delayed post-test. Direct CF did not facilitate improvement in either the immediate or delayed post-test. In Shintani et al.'s (2014) study, the researchers explain that the learners paid less attention to the indefinite article than the hypothetical conditional, because they felt that the latter was more salient and semantically important (Shintani et al., 2014, p. 124).

Other studies (e.g., Bitchener et al, 2005; Rummel, 2014) examined the effectiveness of written CF in improving learners' accuracy regarding the use of the simple past tense. Both studies found it to be effective. Frear's (2012) study distinguished between the effectiveness of written CF regarding the use of the regular simple past tense (add the suffix 'ed') and irregular simple past tense (item-based-lexical item). He found that written CF is effective for the use of the regular simple past tense but not the irregular forms.

In Bitchener et al.'s (2005) study, prepositions were investigated as a single category and it was found that these were less responsive to written CF compared to the English articles and simple past tense. Because there are subcategories of English prepositions and each might respond differently to written CF, Guo (2015) investigated the effectiveness of written CF for treating errors related to the use of prepositions of space. He found that written CF was ineffective with regard to Chinese EFL learners. Further research on written CF, comparing different preposition subcategories, might be needed before we can draw any conclusions in this regard.

The findings from focused written CF reveal that rule-governed structures (e.g. the regular simple past tense and English articles) are potentially more treatable than less-rule governed or idiosyncratic structures (e.g. prepositions). Research which examined focused written CF targeted only limited types of linguistic structures. In order to draw conclusions about whether some types of errors are more amenable to written CF than others, researchers must expand the scope of the targeting to include more categories of rule-governed and less rule-governed errors. Because of this, the current study aims to contribute to the written CF research by examining a new category of rule-governed errors, comparatives which has not been examined in the previous research.

3.7 Focused versus unfocused written CF studies

In written CF, it has been suggested that focused written CF is more effective than unfocused written CF. It has been suggested that, with focused written CF, learners receive a lower attentional cognitive load, which might facilitate L2 development (Bitchener and Storch, 2016). Several researchers have investigated whether focused written CF is more effective than unfocused written CF; for example, Ellis et al. (2008) provided focused and unfocused written CF to 49 Japanese intermediate students. Direct error correction was provided to the focused group on article errors only and to the unfocused group on both article errors and other types of errors. They found that both the focused and unfocused written CF were equally effective and that no significant difference existed between the two, but also that the focused group continued to increase their accuracy in the delayed post-test, which was not the case for the unfocused group.

Sheen et al. (2009) also compared the effectiveness of focused (English articles only) and unfocused written CF (articles, the verb to be, the regular past tense, the irregular past tense and prepositions) with regard to 80 ESL students. Both groups received direct corrections on these errors. There was also a writing practice group, which received two writing tasks, and a control group. The researchers found that the focused written CF was significantly more effective than the unfocused written CF over the nine week period, but admit that the unfocused group received unsystematic written CF throughout the study, which might have affected the results of the study.

From these two studies, it is impossible to draw a conclusion about the superiority of focused over unfocused written CF. Both of these studies targeted only one type of written CF (direct correction) and targeted English articles in the focused written CF. Written CF research that

compares the effectiveness of focused and unfocused written CF may need to target other types of written CF and different types of focused linguistic structures before any conclusions could be drawn in this regard.

3.8 Studies on newly-learned linguistic structures

Most of the previous written CF studies targeted linguistic structures that had already been learned (e.g. Stefanou, 2014; Bitchener and Knoch, 2010; Bitchener, 2008; Bitchener and Knoch, 2008; Sheen, 2007). These studies found both short- and long-term effects from one or two treatments of written CF.

It could be argued that the effect found in these studies was due to the accumulative benefit of previous exposure to the linguistic structures and written CF, rather than simply the one or two treatments that the students received for the purpose of the study. Bitchener (2008) points out that further research is needed to examine whether learners benefit from one treatment of written CF when targeting newly-learned linguistic structures (Bitchener, 2008, p.116). This research responded to Bitchener's (2008) call, as it targeted newly-learned linguistic structures, which means that the students did not receive any formal instruction on these structures, and that the researcher introduced them to students solely for the purpose of the current study.

3.9 Studies of different instructional contexts (EFL versus ESL)

The instructional context means whether the students are learners of English as a foreign language, EFL or as a second language, ESL. The instructional context may play a role in how motivated the students are to attend to their teachers' written CF regarding their grammatical errors. Foreign language learners might attend better to written CF than second language learners because their instructional activities are more focused on form and grammatical accuracy than on communicating meaning (Bitchenr and Storch, 2016, p. 31), whereas most ESL programs focus on how to use English communicatively, so ESL learners might be less motivated to focus on their grammatical accuracy. The learners' experiences in these two different instructional contexts may, therefore, shape their goals, attitudes and belief about writing and written CF (Bitchener and Storch, p. 31).

Bitchener and Knoch (2008) examined if the instructional context impacted on the learners' responses to written CF, targeting the two functional uses of articles. They compared international students (EFL) and migrant students (ESL), and both groups received treatment

as follow: a) direct correction, b) direct correction plus a written metalinguistic explanation, c) direct correction plus an oral and written metalinguistic explanation and d) a control group which received no feedback. They found that there was no significant difference regarding accuracy improvement between the international learners (EFL) and migrant learners (ESL). They interpreted their results as showing that no difference might exist between these two groups based on the instructional context (Bitchener and Knoch, 2008). The migrants originally came from an EFL context and may have only recently become migrants or their exposure to English language may have been similar to that of the international learners (Bitchener and Knoch, 2008).

The written CF research on the role of the instructional context and whether it influences how learners attend to written CF is very limited. A conclusion cannot be drawn based on a single study, Bitchener and Knoch (2008). Moreover, written CF studies need to target EFL learners who are based in their home country, where English is not the native language, and ESL learners who are based in a foreign country, where English is the predominant language. Research is also needed to explore whether the instructional context plays a moderating role in the effectiveness of written CF that targets different types of written CF and different types of errors.

3.10 Studies on the moderating effect of cognitive factors (the proficiency level of the learners)

Proficiency level is associated with existing knowledge and related to the attention and working memory capacity that learners can devote to cognitive processing (Bitchener and Storch, 2016). In the majority of the published written CF research, the participants in quasi-experimental studies are drawn from pre-existing classes. Frodeson and Holten (2003) claim that learners in the same class vary widely in terms of their level of language skills and sub-skills, so one cannot assume that they are all at the same level. In the majority of previous written CF studies, the level of the program was taken to represent the proficiency level of the participants enrolled on that program, so the participants represent a single proficiency level (Guo, 2015). This creates variation regarding the criteria used to determine learners' proficiency levels across different educational systems around the world (Guo, 2015); for example, what is regarded as low intermediate in South America might be regarded as high intermediate in the Middle East. This might make it difficult to replicate studies or draw comparisons between their results (Bitchener, 2012).

Some written CF studies (e.g. Robb et al., 1986; Semke, 1984) used pre-tests to confirm that all of the participants were at a similar proficiency level before proceeding with the data collection. It could be argued that this pre-test does not provide a sufficient demonstration of the participants' overall proficiency level because it targets only the highly specific, limited linguistic structures which are the focus of the study (Guo, 2015; Van Beuningen et al., 2012). Due to this weakness, some researchers believe that learners' overall proficiency level should be assessed as an initial stage of CF studies (Guo, 2015; Van Beuningen et al., 2012).

To date, only a few published studies (Guo, 2015; Van Beuningen et al., 2008, 2012) have examined the effectiveness of written CF for learners of different proficiency levels; for example, Guo (2015) compared Chinese students with higher and lower proficiency levels. These students were in their first year of college, attending an intensive English course, where accuracy in writing was required. Guo (2015) found that the proficiency level of the learners did not play a significant moderating role regarding the effectiveness of written CF. Guo (2015) concluded that this may have been because the participants in his study were drawn from a similar instructional context and shared the same learning experience. He claims that the difference in the participants' proficiency level scores was insufficient to cause significant differences. He further claims that it was only one test so the learners' scores might not reflect the actual proficiency level of the learners (Guo, 2015, p. 215).

Van Beuningen et al. (2012) investigated whether indirect CF is more helpful for higher level learners (with high metalinguistic knowledge) than lower level ones. They found no significant interaction between the learners' proficiency level and the effectiveness of written CF, and reported that this might have been due to the fact that the difference between the learners' proficiency levels in their study was insufficiently large. They also interpreted their results according to the educational context of the learners, claiming that L2 was the means rather than the goal of the instruction. They thought that their participants' level of metalinguistic awareness was too low to enable them to benefit fully from indirect CF (Van Beuningen et al., 2012, p.34).

Based on the conclusions of both Guo'(2015) and Van Beuningen et al.'s (2012) studies, I think that any study that aims to examine whether proficiency level plays a moderating role in the effectiveness of written CF should take care when selecting the groups. When choosing participants from pre-existing classes, as is the case in this study, the researcher should ensure that these classes are mixed-ability. The researcher can refer back to the students' scores and

overall proficiency in English to provide primary confirmation of a variation in the students' proficiency levels and that the gap between the students in the upper level and lower level, respectively, is obvious. The researcher can then conduct a proficiency level test to ensure that students are labelled at the appropriate level.

3.11 Research on learners' uptake of written CF

While many studies have examined the effectiveness of written CF in improving the grammatical accuracy of learners with regard to both revision and new writing, limited research has explored learners' uptake of the different types of written CF. One of the criticisms of written CF is that learners fail to pay attention to it (Truscott, 1996). Some teachers comment that they spend less time on written CF because their students pay little attention to it (Ferris, 2014). This encouraged some researchers to explore learners' responses to written CF; for example, Ferris and Roberts (2001) provided feedback to ESL university students and found that the students corrected more than 61% of their errors within 15 minutes.

Ferris and Roberts's (2001) study was conducted under controlled experimental conditions. Ferris (1997) conducted a longitudinal classroom study to investigate 1,467 teacher comments on 110 first drafts and revisions of students. She found that 109 of the teachers' comments were related to grammar issues. The students responded to most of the comments, leaving only 14% of the comments unaddressed in their revisions. In her (2006) study, Ferris found that, of the 5,707 errors which were marked by the teacher, the students responded in 90.7% of them. About 9.3% of the errors were coded as no change which means that the learners repeated the same errors in their revision. The findings of these studies suggest that, when learners received feedback from their teachers under controlled or natural classroom conditions, they attended to most of it and they tried to apply it (Ferris, 2006); however, at times, the learners did not attend to their teachers' feedback.

Most of the studies discussed above (Ferris, 2006; Ferris and Roberts, 2001; Ferris, 1997) are descriptive in nature, focusing on examining learners' responses to written CF by providing the total numbers and percentages of the learners' errors, the teachers' written CF and the learners' responses to it, so the results of such studies provide data on the numbers and percentages of the errors which were corrected by the students in response to the written CF. These studies failed to provide any data on the type of uptake, however: repair and needs

repair. The current study aims to fill this gap in the written CF research, as both repair and needs repair are examined.

Repair, in the current study, is defined as a correct response to an error in a subsequent revision. Further, repair is divided into two subcategories: repair with understanding and repair without understanding. The former is a correct response to an error in a subsequent revision where an accurate relevant grammatical rule is explicitly provided, while the latter is a correct response to an error in a subsequent revision with the inaccurate provision of the grammatical rule.

Needs repair refers to an inaccurate response to an error in a subsequent revision. It is divided into three sub-categories: same error, different error and new error emerged. Same error refers to a repetition of the student's initial error; different error means that the student neither corrects nor repeats the initial error, but makes a different error; and new error emerged means that a correct response in the initial writing becomes incorrect in the subsequent revision.

Some researchers highlight the importance not only of learners' using their teachers' feedback but also whether they understand it or not; for example, Zho (2010), in his study, examined the use and understanding of both peer and teacher CF. He found that the students responded to and incorporated more teacher CF (74%) than peer CF (46%) in their revision. However, only 58% of the teachers' CF was understood. Several studies have examined how learners respond to written CF from a socio-cultural perspective. Using retrospective interviews and content analysis of drafts and CF, Hyland (1998), Goldestein (2006) and Lee (2007) found that students noticed-copied their teachers' feedback into their revisions without understanding it.

In order for learners to effectively process written CF, first they need to notice it (Schmidt, 1990; Wigglesworth and Storch, 2012). Qi and Lapkin (2001) point out that the *quality* of noticing is important when processing CF. Noticing with understanding is a key factor for the successful processing of input-written CF (Schmidt, 2001; Qi and Lapkin, 2001; Gass, 1997). Written CF, which is noticed-copied but not understood, might lead to accurate revision but not necessarily contribute to L2 development (Zho, 2010, p.5).

Moreover, the quality of the feedback processing may be affected by the type of feedback provided. It is hypothesized that learners may attend to more explicit types of written CF because the feedback is salient (Wigglesworth and Storch, 2012, p. 368). This might lead to the expectation that learners may attend to and understand direct written CF more than indirect CF as, in the former, errors are underlined and corrections are provided above the errors, so the learners only need to notice the difference between the correct and incorrect forms (Wigglesworth and Storch, 2012, p. 368).

Socio-cultural Theory views learning as a social process which occurs in interaction with others (Swain and Lapkin, 2002). Studies which are informed by socio-cultural theory used qualitative data collection tools (TAP, post-study interviews, pair talk and observation) to determine how the students process written CF and explain why only some of the written CF is incorporated into the learners' revised texts; for example, Swain and Lapkin (2002) examined how learners process written CF in collaborative writing. The researcher used a pre-test and post-test design to demonstrate the effect of reformulation and the students' responses to it. In the study, one pair of students, working collaboratively, were asked to write a story together and received reformulation from the researcher. They were asked to 'talk it through' as they confronted their errors and resolved problems while comparing their original written story with its reformulation. Using pair discussion, the researchers found that the students discussed and accepted the feedback and learned about it during the collaborative talk. They also found that the students explicitly rejected some of the feedback, for two reasons. The first reason was that they sometimes questioned the feedback because it did not match or accord with a rule that they had already internalized. The second reason was to preserve their original meaning. The students felt that the teachers' reformulation changed their intended meaning and so they did not incorporate it into their revision, choosing to preserve their own meaning instead.

About 80% of each student's changes made in their post-test were correct (they were asked to rewrite the story). Swain and Lapkin (2002) point out that the rejection of reformulation does not necessarily mean that no learning has occurred. Both the acceptance and rejection of the reformulations led to 'talking it through', which process mediated the internalization as each student was able to draw on the knowledge that they had previously collaboratively

constructed. It helped them to reflect on the language points and gain a deeper understanding of the proposed changes.

Macqueen (2012) obtained similar findings from a longitudinal study, where she used retrospective interviews after each feedback cycle. By using the data from the post-interviews and tracing certain words and chunks in each student's writing over time (written at different times), she found that some errors and patterns of language were resistant to change over time, despite the written CF provided, because of the learners' strong beliefs and earlier instructional language experiences.

Studies examining learners' uptake and how students process written CF are limited. The majority of the published written CF research examined the effectiveness of written CF by using quasi-experiments, where the focus was on the final product of the learners. I think that more research is needed to find out how students process different types of written CF and why some written CF is not incorporated into their subsequent writing.

To summarize, this chapter started with a discussion of the grammar correction debate and the empirical, theoretical, pedagogical and practical claims that have been raised against it. The remainder of the chapter was devoted to a discussion of the relevant written CF research. The focus was on the design and findings of these studies and how these are relevant to the current research. In the next chapter, Chapter Four, there will be a discussion on the current research methodology, where the research paradigm, methods and procedures for the data collection and analysis will be explained in detail.

CHAPTER FOUR

METHODOLOGY

4.1 Introduction

Chapter four discusses the research methodology. It is divided into four sections. In section 4.2, the research questions will be presented, as a reminder to the reader. A framework of the current research is then presented. It explains the interconnection between the four components: the research paradigm, design, approach and methods (Creswell, 2014, p.5). Each of these components will be discussed in detail in this section.

Section 4.3 discusses the pilot study which was conducted before the main study to test the procedures. The purpose and procedures of the pilot study are explained and the implications of the pilot study findings for the main study are discussed.

Section 4.4 of this chapter describes the main study's data collection process. The data collection tools (Quasi-experiment and TAP) will be explained separately in detail. There will then be a discussion about the instruments and procedures used to collect and analyse the data. The validity and reliability will be highlighted.

In Section 4.5, there will be a discussion of the ethical issues that were considered throughout the planning of the research and the implementation of its procedures. This section provides an overview of the limitations of the current research as well.

4.2 Research Methods and Design

In this section, research questions will be presented. There will be detailed discussion on the research philosophical view, approach, methods and design.

4.2.1 Research purpose and questions

This research examines the effectiveness of direct and indirect written CF in improving the grammatical accuracy of young Omani learners. It targeted two new learned linguistic structures: comparatives and prepositions of space.

The current research implemented a mixed method design by combining both quantitative (quasi-experiment) and qualitative (think aloud protocols) methods to develop a better understanding of the research phenomenon (direct and indirect written CF). In this research, mixed methods were used for the purpose of complementarity, to shed light on different aspects (Angouri, 2018, p. 42) of written CF. The quasi-experiment provided answers to the confirmatory questions regarding whether direct or indirect written CF is effective in improving the grammatical accuracy of students with regard to newly learned linguistic structures. It also provided answers on whether the type of error (comparatives versus prepositions of space), type of written CF (direct versus indirect) and proficiency level of the students (higher versus lower) influence the efficiency of written CF.

The TAP provided answers to the exploratory questions. It provided information on how students repair their errors in response to direct and indirect written CF and what type of repairs they make in their subsequent revisions. It also provided data on why some written CF was not incorporated into the students' subsequent revisions. The TAP shed light on why some students failed to benefit from the direct and indirect written CF they received. Table 4.1 (below) summarizes the research method used to answer the three main research questions and three sub-questions:

No.	**Research Questions**	**Research methods**	
		Quasi-experiment	**TAP**
1	Does written CF help Omani EFL students to improve their grammatical accuracy with regard to newly-learned linguistic structures during revision and in new writing over time?	√	
1a.	Does the effectiveness of written CF vary according to the targeted linguistic structure (the comparative versus prepositions of space)?	√	
1b.	Does the effectiveness of written CF vary according to the type of feedback (direct CF and indirect CF)?	√	
1c.	Does the effectiveness of indirect written CF vary according to the proficiency level of the students (higher versus lower level)?	√	
2	How do the students repair their errors in response to direct and indirect written CF in their subsequent revision?		√
3	Why was some written CF not incorporated by certain students into their subsequent revision?		√

Table 4.1: Current research questions and sub-questions

4.2.2 Research framework

Creswell (2014) introduced a research framework model which illustrates the relationship between four components: research philosophy, research approach, and research methods and design. In Figure 4.1 (below), Creswell's (2014, p. 5) framework is used to explain the interconnection between the current research's philosophy, design, approach and methods.

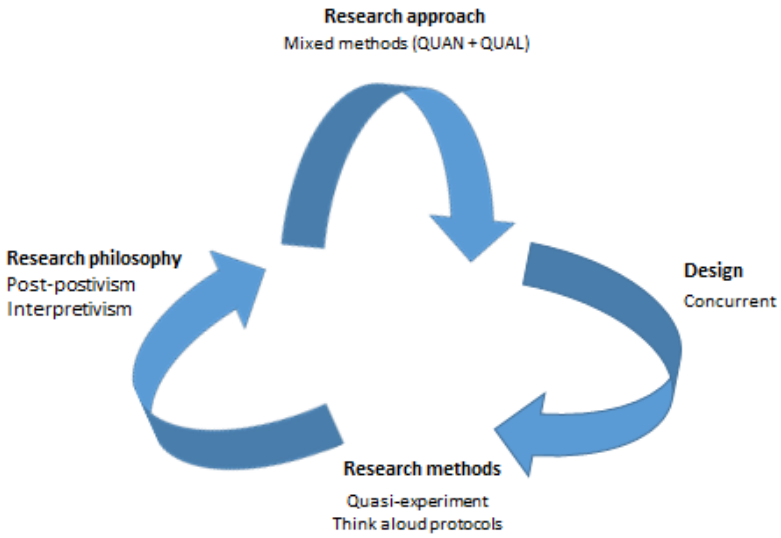

Figure 4.1: Current research framework

This research is framed according to my ontological and epistemological world view that there is no best paradigm. In order to reveal different aspects of knowledge about written CF, I adopted assumptions from multiple paradigms: postpostivism and interpretivism. I employed mixed a methods approach to answer the various questions. I used both quantitative (quasi-experiment) and qualitative (TAP) methods for the data collection and analysis in this research.

The research adapted a concurrent design where both quantitative (quasi-experiment) and qualitative (TAP) data were collected simultaneously. That was because the sample of TAP was taken from the same classes (whole sample) as took part in the quasi-experiment. In the following sub-sections, each component of the current research framework, presented in Figure 4.1 (above), will be discussed in detail.

4.2.3 Research philosophy

This research draws on philosophical assumptions from two paradigms: postpostivism and interpretivism. These two paradigms hold different ontological and epistemological assumptions (Nudzor, 2009). Ontology is related to the nature of reality, while epistemology refers to how knowledge is known and can be acquired (Creswell, 2014).

Postpostivism is variously called the ‘’scientific method’’, ‘quantitative research’ and ‘empirical science’ (Creswell, 2014). It is the predominant philosophy for quantitative research in the human sciences (Teddlie and Tashakkorie, 2009). It evolved as a reaction to the criticism that postivism received regarding the premise that there is absolute true knowledge and that knowledge is based on secure foundations. Postpostivists believe in a critical reality, since all measures and observations are fallible (Creswell, 2014). Nonetheless, postpostivists believe that the world is governed by laws, and that the social world is like the natural world, which is best explained in terms of a determinist philosophy of cause and effect (Creswell, 2014). Based on that presumption, postpostivists believe that people's actions can be explained by the social norms to which they have been exposed (Creswell, 2014). The postpostivists' role is to uncover the laws that govern human behaviour (Creswell, 2014). They start an investigation with theories and hypotheses, then use careful measurements and observations to test these theories and finally additional tests and revisions are conducted to verify them (Creswell, 2014).

Interpretivists, on the other hand, believe in multiple realities (Creswell, 2014), which they believe are created by individuals rather than waiting to be discovered (Cresswell, 2014). They emphasize that human beings differ from physical phenomena because they create meanings. These meanings are varied and multiple and lead the researcher to seek a complexity of views rather than narrow the meanings into a few limited categories (Creswell, 2014). Interpretvisits view knowledge as being socially constructed rather than objectively determined (Creswell, 2014).

They develop their subjective meanings based on the interactions between people, such as conversations and meetings (Creswell, 2014). Furthermore, researchers who adopt the interpretivism approach emphasise the importance of language, culture and history in their interpretations of the social world (Saunders et al., 2016). They often address the 'processes' of interaction among individuals and focus on the specific contexts in which people live and

work in order to understand the historical and cultural settings of the participants (Creswell, 2014).

There has been debate regarding the adoption of multiple paradigms in a single research project. Some researchers believe that it is impossible to combine multiple paradigms (e.g. postpostivists and interpretivists) because they adopt contrasting ontological and epistemological positions about what a social world is like and how it is possible to understand a social phenomenon (Angouri, 2018; Nudzor, 2009). Simply put, from the ontological perspective, postpostivists believe in a single reality whereas interpretivists believe that there are multiple realities. In order to obtain knowledge, postpositivists need to uncover the reality which is out there in social life through tests and measurements. In contrast, interpretivists believe that knowledge is socially-constructed, so researchers need to enter the social world, interact with the individuals within it and interpret their different experiences in order to develop a better understanding of a phenomenon (Nudzor, 2009).

Other researchers believe, however, that combining assumptions from multiple paradigms in a single piece of research is beneficial in revealing different aspects of social 'reality' (Angouri, 2018, Creswell, 2014). I believe that combining different paradigms in a single piece of research is compatible. In this research, I adopted assumptions from both the postpostivists and interpretivists in order to understand more clearly the phenomenon under investigation (written CF) (Teddlie and Tashakkori, 2009, p.99). Because my enquiry sought to find a cause and effect relationship, I decided to adopt the scientific method where I used a quasi-experiment to find whether a treatment, written CF, had an effect on improving students' grammatical accuracy. Based on the theoretical foundations of the written CF research, discussed in Chapter Two, I predicted that certain factors may moderate the effectiveness of written CF: the type of written CF, the type of errors and the proficiency level of the learners. Therefore, I decided to test whether or not these factors have an impact on the effectiveness of written CF.

The knowledge I could obtain through the lens of the postpostivists, however, would provide only the patterns of the groups' performance under certain conditions. That knowledge is also based on the final performance of the students, so it focuses on the product rather than the process of written CF. Moreover, I could not assume that all students would benefit from

written CF similarly especially because, in the current study, the sample includes students of different proficiency levels.

In order to understand how the students respond to CF, I also needed to view them as individuals who have a consciousness, understand things differently and therefore have different reasons for their responses and actions. Therefore, it was necessary to look at the reality from a different perspective, i.e. through the interpretivists' lens. I needed to examine written CF through the eyes of individual students while processing and responding to it. To do so, I employed introspective and retrospective TAP, whereby I interacted with individual students in order to gain an in-depth understanding of how they processed written CF. I scaffolded the students to find out how they cognitively process the feedback and why some of them find it difficult to benefit from direct and indirect written CF. The scaffolding procedure is explained and an example is provided of how the scaffolding was done in the coming sub-section 4.2.6.2.2.

Scaffolded written CF provided an opportunity for the students to negotiate the form and discuss their errors. The scaffolding helped me to understand the students' current developmental level and why some of them find it difficult to move to a zone beyond their current one. Interpretations of the scaffolded interaction helped me to identify different reasons why some students repeated errors and were not able to incorporate feedback into their subsequent revisions.

In this research, I adopted an epistemological perspective, that combining the paradigms in a single piece of research is beneficial for revealing different aspects of 'reality' (Angouri, 2018, 2014). The combination of paradigms provided a more complete picture of written CF (Creswell, 2014), which I might have missed if I had adopted only a single paradigm.

4.2.4 Research approach (mixed methods)

Mixed methods are defined as "the class of research where the researcher mixes or [emphasize mine] combines quantitative and qualitative elements" (Angouri, 2018, 39). Mixed methods research is described as the 'third methodological movement' (Tashakkori and Teddlie, 2003, p. 4), as it incorporates approaches from both the quantitative and qualitative research traditions, and combines them in unique ways to answer research questions that could not be answered in any other way.

In the literature, there exists a theoretical argument about using 'mixed methods' in a single study, as some researchers believe that research methods carry 'epistemological commitments' and see quantitative and qualitative research as belonging to separate paradigms (Bryman, 2012, p.629). The quantitative approach is associated with the postpostivist paradigm, while the qualitative approach with the interpretivist paradigm. Therefore, some believe that mixed methods are incompatible with each other. Other researchers see that combining quantitative and qualitative methods is compatible, since there is a rationale for how it will be done and for what purposes (Angouri, 2018, p.38).

Triangulation was the key reason for adopting a mixed methods approach in the current research. Cohen et al. (2011, p. 195) defined triangulation as "an attempt to map out, or explain more fully, the richness and complexity of human behaviour by studying it from more than one standpoint'' and, according to Denzin (1978, p. 28), the logic of triangulation is based on the premise that "no single method ever adequately solves the problem of rival causal factors. Because each method reveals different aspects of empirical reality, multiple methods of observations must be employed''. Denzin (1970) identified four types of triangulation (reproduced in Angouri, 2018, p.42):

1. Data triangulation involves time, space and persons.
2. Investigator triangulation involves multiple researchers working on an investigation.
3. Theory triangulation involves using more than one theoretical scheme to interpret a phenomenon.
4. Methodological triangulation involves using more than one tool to gather data, such as combining the use of a survey, interviews and documents in a single piece of research.

This research employed the third and fourth types of triangulation: theory and methodological triangulation. Theoretically, the research draws on assumptions from two paradigms: postpostivism and interpretivism, as discussed in Sub-section 1.3.1. As a postpostivist, I was able to examine a cause and effect phenomenon. I used a quasi-experiment to test certain factors-variables (type of written CF, type of errors, proficiency level) that might impact on the effectiveness of written CF. I adopted the position of an experimenter who remained detached from the participants.

However, postpostivism would provide only one aspect of reality about written CF which is taken from the final product of the students and understood from the group's patterns of performance. Therefore, I adopted an interpretivist position in order to understand other realities related to written CF, where the focus is on the process rather than the product. I interacted with individual students (introspective and retrospective TAP) in order to gain an in-depth insight into how different students processed written CF. I took the position of a participant who scaffolded the students in order to support them and understand the difficulties they experience regarding direct and indirect written CF, then interpreted the different meanings of the 'realities' from the scaffolded interaction.

Methodologically, the current research adopted quantitative and qualitative approaches for the data collection and analysis in order to answer different questions. The quasi-experiment (quantitative) provided answers to the confirmatory questions regarding whether written CF was effective or not, and whether the effectiveness of written CF vary according to some factors (type of errors, type of written CF strategy and proficiency level of students), while the TAP (qualitative) provided answers to the exploratory questions about how the participants processed different types of feedback and why some written CF was not incorporated into their subsequent revision (students repeated same errors). In this research, theoretical triangulation helped me to examine written CF from different perspectives (postpostivism and interpretivistm), so different aspects of reality were revealed. Methodological triangulation helped me to select appropriate quantitative and qualitative methods to answer my research questions.

Despite the many advantages that mixed methods research offers, researchers have also identified some challenges associated with it. Creswell and Plano Clark (2011, p.13) mentioned that mixed methods is, in practice, more complex than mono method approaches, as they require a set of skills, intensive resources and a considerable amount of time. Creswell and Plano Clark (2011, p.13) mentioned that researchers need to be acquainted with both the quantitative and qualitative data collection and analysis techniques. This was the case in the current mixed method research where, during the research design stage, I anticipated challenges related to the skills, time and resources required for the study's implementation. Anticipating these challenges gave a broad picture only, so it was necessary to obtain specific details about what works and what does not in this specific research context. It was vital to conduct a pilot study before the researcher started collecting the data

for the main study. The pilot study provided a clear picture of every single detail; the types of skills required by both the researcher and the participants, the types of resources needed and how the time issue could be managed. Based on the pilot study's findings, I was able to set out a clear plan and procedures for the main study data collection and analysis; for example, in order to be able to analyze the data, I required extra training on the Statistical Package for Social Sciences (SPSS).

4.2.5 Research design

Teddlie and Tashakkori (2006, p. 13) presented four mixed methods designs; concurrent, sequential, conversion and fully integrated (Teddlie and Tashakkori, 2006, p. 20). This research adopted the concurrent design, which is presented in Figure 4.2 (below). The concurrent design was used to collect quantitative (quasi-experiment) and qualitative (TAP) data simultaneously.

Tashakkori and Teddlie (2003, p.229) described the concurrent design as the best-known of the mixed method designs. It was advantageous in that, in this research, I could use it to answer the exploratory and confirmatory questions about the research phenomenon (written CF). The use of concurrent data collection in this research resulted in a fast data collection process. I was able to collect both quantitative and qualitative data on each linguistic structure within four weeks. For more details, please see procedures for the quasi-experiment in sub-section 4.4.1.6.3 and the TAP in sub-section 4.4.2.5 in this chapter.

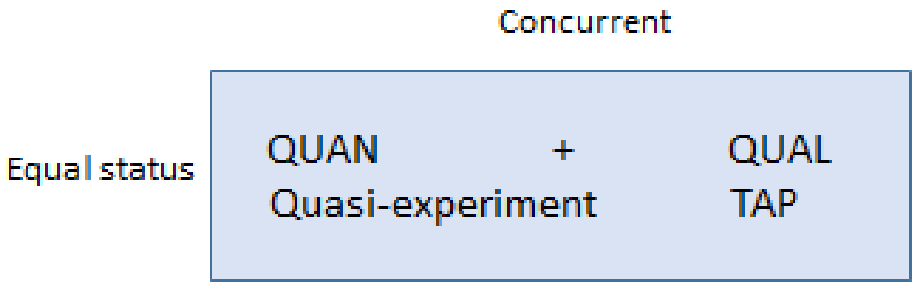

Figure 4.2: Concurrent design

During the data collection, the quasi-experiment and the TAP were concurrent. The sign (+) means that the data collection was performed simultaneously. The participants in the TAP

were chosen from the whole sample used in the quasi-experiment, purposely, for two reasons. First, I was seeking a homogenous whole sample. Second, the data collection procedure was performed during the school day, and so interrupted the students' classes. Collecting both the quasi-experimental and TAP data in parallel meant affecting fewer overall classes. During the procedure for the data collection, the TAP participants received similar treatment to the whole sample except during the revision and immediate post-tests, where they received extra treatment, which was the TAP.

Figure 4.3 (below) shows the three groups and the simultaneous implementation of the quasi-experiment and the TAP for each targeted linguistic structure. The yellow squares show that six students per group received extra treatment (TAP) for the revision and immediate post-test.

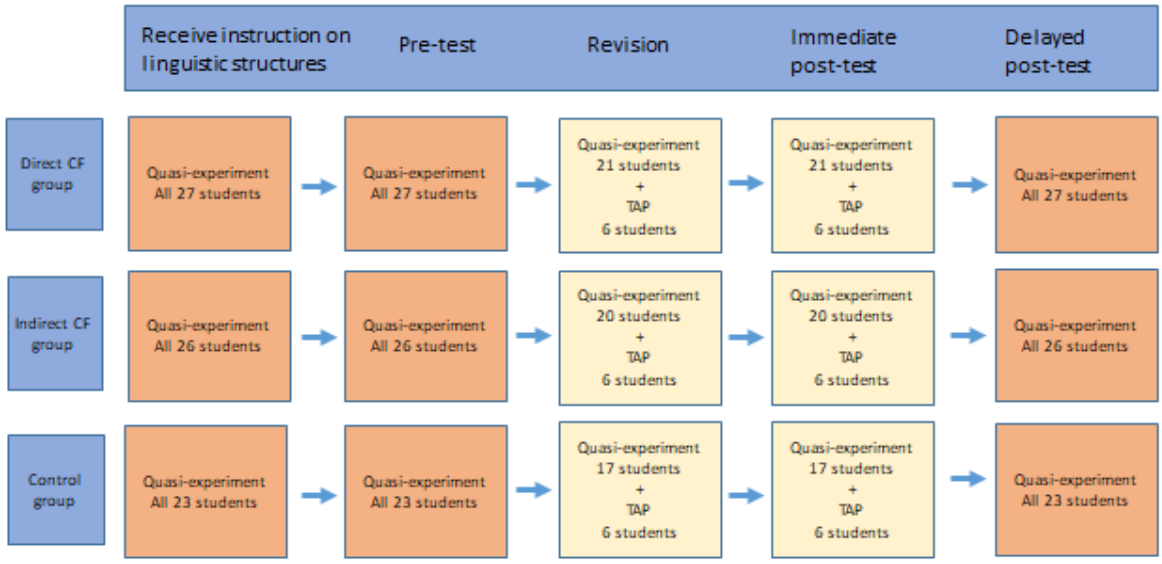

Figure 4.3: The simultaneous implementation of the quasi-experiment and TAP

The data obtained from using each method (the quasi-experiment and TAP) were analyzed separately. SPSS was used to analyze the data obtained from the quasi-experiment. Quantitative and qualitative analysis was conducted using the data from the TAP. Equal priority was given for both the QUAN/Quasi-experiment and QUAL/TAP in the data analysis and discussion because these provided answers to different questions about written CF. The findings were discussed according to each research question.

Despite the advantages offered by the concurrent design, I faced some challenges associated with its use. It required effort (Creswell, 2003, p. 217) to collect the data. I found it difficult to collect quantitative data (the quasi-experiment) simultaneously from three groups, and so involved 12 teachers in the process of the data collection. These teachers played minor administrative roles in distributing and collecting the test papers, whose support enabled me to work with the different groups concurrently. There were also challenges related to time while collecting data from the TAP, as I tried to finish collecting the TAP data within a similar timeframe to collecting that of the quasi-experiments tests.

4.2.6 Research methods

In this sub-section, there will be a discussion of the two research methods (the quasi-experiment and TAP) which were used for the data collection. The rationale behind using each tool will be discussed.

4.2.6.1 Quasi-experiments

An experimental design is a research method which is used to investigate causal relationships (Shadish et al., 2002, p.3-6). It is used in social work to identify what happened to people who received a particular intervention (Thyer, 2012, p. 17).

There are two types of experimental design: randomised experiments and quasi-experiments (Reichardt, 2009, p.46). Quasi-experimental research is similar to experimental research in that there is a manipulation of an independent variable on dependent variable(s), observed on subjects in a controlled environment (Verma, 2016, p.2). It differs from experimental research because there is no random assignment to groups (Reichardt, p.46). Since randomised experiments are not always possible due to ethical and practical considerations, quasi-experiments are often used (Reichardt, 2009, p.46).

Since this study investigated a causal relationship in a natural setting (a classroom), it employed a quasi-experiment design which included a pre-test and post-test, similarly to most empirical research on the effectiveness of written CF. The design of this study included a control group selected from the same school where the experiment groups were based. The control group was included in the quasi-experiment design in order to ensure that, were there any effect/change in accuracy, this was because of the treatment rather than due to other factors.

4.2.6.2 Think aloud protocols (TAP)

The think-aloud protocol (TAP) is a research method that helps researchers to understand the thought processes of individuals as they attempt to complete a specific activity (Bowles, 2010). Charters (2003, p.68) defined the TAP as "a research method in which participants speak aloud any words in their mind as they complete a task". The TAP is advantageous in that it offers a relatively easy way to collect data and allows the investigation of the reactions, feelings and problems that learners may experience while performing tasks (Oh and Wildemuth, 2017, p. 198).

The TAP was used in this research since it allowed the researcher to investigate the reactions of the learners to the different treatments they received (direct, indirect and no feedback). The TAP provided answers to different questions about written CF, shed light on different aspects of written CF and provided a better understanding of the research problem.

Ericsson and Simon (1984, 1993) categorized verbal reports based on a temporal frame. Concurrent or introspective reports are collected as the participants verbalize while performing the task, whereas retrospective reports are collected after the participants have completed the task (cited in Bowles, 2006, p. 361). In addition to categorizing verbal reports in terms of temporal space, Ericsson and Simon (1984, 1993) distinguished them based on what the learners are requested to do while thinking aloud. Non-metalinguistic verbal reports require the participants simply to verbalize their thoughts, while metalinguistic verbal reports require them both to verbalize their thoughts and provide reasons or justifications for what they have just verbalized (Ericsson and Simon, 1984 cited in Bowles, 2006, p.361).

4.2.6.2.1 Introspective metalinguistic TAP

Cooper (1999, p. 241) suggested that verbal reports which follow rapidly after a thought process can reflect conscious thought and so researchers must focus on the immediate awareness of participants rather than delayed explanations of their actions. This study used an introspective metalinguistic TAP to investigate the type of repairs that the students made during their revision (repair with understanding and repair without understanding) in response to different types of written CF (direct and indirect). The students were asked to produce introspective metalinguistic TAP both after receiving treatment and while engaged in their subsequent writing (revision and immediate post-test). They were asked to provide justifications for the sentences they produced. Evidence of repair (with understanding and

without understanding) was obtained from their ability to provide accurate justifications (articulate explicit grammatical rules about the sentences).

4.2.6.2.2 Retrospective TAP

Some researchers rely on TAP transcripts as their sole source for their data collection. However, Ericsson and Simon (1980, p. 235) emphasized that think aloud data from the working memory are always incomplete and exclude some thought processes which cannot be held in the working memory long enough to be expressed verbally. Think aloud reports may also vary in terms of their quality and quantity. In response to these problems, some researchers use follow-up strategies, such as retrospective questioning, follow-up interviews, recall protocols, exit interviews and questionnaires (Charters, 2003, p. 74).

Charters (2003, p. 73) mentioned that, when using retrospective questioning to illuminate and expand on think aloud results, this may add deeper information about the thought processes. Since the TAP data produced by the students in this research were limited in terms of quality, I used retrospective questioning for data expansion, conducted after each student finished producing her TAP data. Gibson (1997, p.55) suggested that data are more reliable when the time between the think aloud recording and exit interview/retrospective questioning is very short. In this study, immediately after each student finished producing her introspective TAP, I used a retrospective TAP, where I further checked the students' understanding of the grammatical rules and written CF. I scaffolded individual students who found it difficult to benefit from direct and indirect written CF. This scaffolding supported the students in resolving their errors and helped me to understand why some students repeated the same errors in their subsequent revision. I used retrospective TAPs where after individual students finished producing concurrent verbal reports, I further negotiated errors made by them in their revisions. The scaffolding started from implicit to more explicit assistance as each individual student required (similar to the scaffolding used by (e.g., Aljaafreh and Lantolf, 1994 and Nassaji, 2011). The example below shows how the scaffolding in the current study was conducted.

Example:

01	R:	Have you finished?
02	S5:	Yes, teacher.
03	R:	Did you check errors? What about sentence 1?
04	S5:	'dangerous'?
05	R:	Yes, read the sentence please.
06	S5:	''A lion is more dangerous.''
07	R:	Why you added 'more' here?
08	S5:	Because it is ''more dangerous''
09	R:	Can you explain more?
10	S5:	(silent)
11	R:	Ok, what about other sentences?
12	S5:	''old''
13	R:	Yes, what did you write?
14	S5:	''Mike is old.''
15	R:	Do you need to make changes in the sentence?
16	S5:	(silent)...''is'', I added ''is''
17	R:	Why you added ''is''?
18	S5:	Because singular.
19	R:	What is singular?
20	S5:	''Mike''
21	R:	Yes we add ''is'', but there is something else missing, have you read the examples?
22	S5:	Yes.
23	R:	Could you please read example number 1?
24	S5:	''Sally is shorter than John.''
25	R:	So what is added in the adjective?
26	S5:	''is'', ''is short''
27	R:	Not ''is'', look at the word ''short'', how it is used in the sentence? Any changes?
28	S5:	''shorter''
29	R:	Yes, why ''shorter''?
30	S5:	(silent)
31	R:	Because the word ''short'' is one syllable, so we add ''er_than'' to make comparative, to compare Sally and John. So what to write for sentence 2?
32	S5:	''old''
33	R:	Yes, what to add?
34	S5:	''er''?
35	R:	Yes, we add ''er''. Good, what about other errors? "Chair A is comfortable chair 2", what is the error here?

In the above example, I scaffolded student S5. The student was not able to provide the grammatical rule for sentence number one, turns (7-10). I tried to make the student notice the error in sentence two, but she was unable to notice the error or what was missing in the sentence, as she replied in turn (16) ''is'', I added ''is''. Then, I tried to make the student notice the difference by reading the examples provided on top of page one. When the student was unable to do notice the comparative form, I explained grammatical rules related to the comparative. So, my assistance started from implicit to more explicit as the student S5 required.

In this section, the research paradigm, approach, methods and design are discussed. The current research combined assumptions from postpostivism and interpretivism to reveal different aspects of written CF. It employed a mixed method approach, whereby both quantitative and qualitative methods were combined to provide answers to different research

questions about written CF. A concurrent design was used, where both quantitative and qualitative data were collected simultaneously. In sub-section 4.3, the pilot study, which was conducted prior to the main study, was presented. In sub-section 4.3, the purpose of the pilot study will be explained. There will be a focus on the implications from the pilot study to the main study.

4.3 Pilot Study

In this section the pilot study which was conducted before the main study will be discussed. There will be a focus on the purpose of the pilot study and the implications from it for the main study.

4.3.1 Purpose of the pilot study

A pilot study can be defined as a "small study to test research protocols, data collection instruments, sample recruitment strategies, and other research techniques in preparation for a larger study" (Hassan, Schattner and Mazza, 2006, p.70).

In this study, the pilot was a small study conducted prior to the main study in order to improve the latter's quality and efficiency. The pilot study had the following aims:

1. To test the procedures to see whether the proposed research methods and instruments were appropriate or not.
2. To identify potential practical problems and challenges related to the research procedures.
3. To modify the main study design and procedures in light of the findings of the pilot study.

4.3.2 Quasi-experiment

A quasi-experiment (pre-test, immediate post-test and delayed post-test) was one of the research tools which was tested in the pilot study. The aim was to see if the designed tasks/tests were appropriate or not. Moreover, I needed to develop skills related to conducting a quasi-experiment and its procedures.

The sample was taken from a Basic Education Cycle Two School in Oman. Thirty students (n=30) from grade six (12 years-old) participated in the quasi-experimental trial. The class was divided equally into two treatment groups, with 15 students per group. One group was provided with direct written CF, and the other group was provided with indirect written CF. There was no control group involved in the pilot study (with no feedback) both due to the small size of the class, and because my focus was mainly on the treatment groups and the procedures for providing and coding the written CF, as well as how the students reacted to it.

4.3.2.1 Implications for the main study

The implications for the main study can be summarized as follows:

a. It was necessary to find a school with three classes in grade six, which would be assigned to two treatment (direct and indirect) groups and a control group.

b. It would be very difficult for a single researcher to manage three different classes during the quasi-experiment, so it would be helpful to ask some of the English teachers at the school to support in the quasi-experiment's implementation (e.g. arrange the seating of the students in the classes, distribute the tests and observe the classes). That support would help me to work with the three classes concurrently.

c. It was necessary to conduct a proficiency level test for the students who would participate in the main study (the quasi-experiment and TAP). I found that the information about the proficiency levels of the students that was provided by the school administration for the pilot study was inaccurate, especially for several medium and low level students, so it was necessary to cross-validate the students' levels based on their scores in English with a proficiency level test, to be taken by all of the students participating in the main study. The proficiency level of the students was one of the study's variables, so it was important to ensure that the students were assigned to the correct level.

d. In Omani Basic Education Cycle Two Schools, each lesson lasts 40 minutes. In the pilot study, the students were given 30 minutes to complete each test, with ten minutes allowed for the test paper distribution and collection. It was found that 30 minutes was appropriate for producing ten short sentences using the targeted linguistic structures.

e. In previous research the time allocated for examining the written CF was between 5-10 minutes. Ten minutes were used where the learners were required to write extended essays. In general, most previous research allocated 5 minutes for examining the written CF

(e.g., Bitchener and Knoch, 2010a; Bitchener and Knoch, 2009b; Bitchener, 2008). Some researchers suggest that five minutes is sufficient for learners to examine feedback (Stefanou and Revesz, 2015, p. 268). The five minutes allocated for the students to examine the written CF provided in the pilot study was found to be appropriate.

f. The tests were piloted for appropriateness. It was found that the writing tests were appropriate as the students could produce the sentences based on picture clues.

g. The error correction criteria were produced following the pilot study.

h. I decided to use a measurement of accuracy, whereby each student's correct responses were counted for each test.

4.3.3 Think aloud protocol (TAP)

Six students from each group participated in the piloting of the TAP (two high, two medium, and two low level proficiency). The sample was a convenience one, selected by the researcher based on the proficiency levels provided by the class' English teacher. The following were the aims in piloting the TAP:

a. To test the TAP procedures and decide how the researcher was going to employ them.

b. To identify any challenges that the students may face while producing the TAP data.

c. To evaluate the clarity and appropriateness of the TAP tests.

d. To time the TAP tasks in order to estimate the total time needed to collect all of the TAP data.

e. To provide the researcher with training on how to lead the TAP task.

4.3.3.1 Implications for the main study

The implications of the pilot for the main study may be summarized under the following points:

a. In order to make the procedure of the TAP data collection easier and faster, the TAP students should be provided with some practice in and demonstration of how to verbalize their thoughts regarding totally different tasks (punctuation- simple present vs present continuous) prior to the data collection.

b. Piloting the TAP procedure was beneficial in that it provided me with some training on how to lead the task.

c. The pilot study was helpful in finding appropriate techniques for the TAP sampling, as some students felt uncomfortable with the TAP sampling technique that I used in the pilot study. Therefore, in order to avoid bias and to provide each student with an equal opportunity to be selected for the TAP, I used a Random Choice Generator Program to select the participants for the TAP employed in the main study. Random Choice Generator Programs are tools that help to generate random numbers. I divided the students in each class into three levels (higher level- medium level- lower level) based on their proficiency level test scores. I assigned a number for each student. I typed the numbers for each level into the Random Choice Generator Program and clicked random choice. I chose 6 students from each class (2 students for each level).

d. As verbalization was time-consuming, especially since I was collecting a relatively high number of verbal reports, piloting the TAP provided me with an estimated time needed to collect the TAP data.
e. The writing tests were piloted to establish whether or not they were appropriate for the TAP. The tests elicited sentences from the students, which involved problem-solving because the students needed to produce verbal reports based on their knowledge of the grammatical rules.

Piloting the quasi-experiment and TAP helped to test the adequacy and appropriateness of the research instruments and also whether the sampling technique employed in my research was appropriate. It supported me to decide which resources that I would need and whether the students required any training on how to engage in the TAP. Information on how training the students on TAPs is provided in sub-section 4.4.2.3. The pilot study made me better prepared to conduct the data collection for the main study.

4.4 Main Study Data Collection

In this section, the main study data collection of the quasi-experiment and TAP will be discussed in detail.

4.4.1 Quasi-experiment

The quasi-experiment was conducted in order to answer Question 1 and Sub-questions 1a-1c. In this section, there will be discussion of the data collection process using this method.

4.4.1.1 Sample

The participants in the quasi-experiment were three classes from class six (12 year-old students) from a female Cycle Two Basic Education School in Oman. It is a public school located in one of the large provincial towns in Oman, with classes from grades 5 to 12. In public schools in Oman, English as a foreign language is taught from grade one based on the educational system reforms which were introduced in 1998/1999. English grammar is taught formally from grade 5 (the first grade in the Cycle Two Basic Education Schools).

Convenience sampling was used in this research. A convenience sample is a type of non-probability or non-random sample, where the subjects are chosen based on certain practical criteria, such as easy accessibility, availability at a given time or a willingness to participate (Etikan, Musa and Alkassim, 2016, p.2). The sample for this study was chosen based on the interests of the researcher and ease of access, as well as the willingness of the school principle, SET and class teacher to cooperate.

Three classes were selected from this school to take part in the quasi-experiment, and randomly assigned to three different treatments: the direct written CF group (n=27), the indirect written CF group (n= 27) and the control group (n=24).

One participant (in the control group) was absent from more than one writing test due to illness. Another student performed only the pre-test and revision (comparatives) before moving to another school. The data related to both of these students were excluded from the quasi-experiment analysis. Six students per group were chosen randomly for the TAP. Since those students received extra treatment (TAP), their tests were excluded from the quasi-experiment's analysis. Table 4.2 (below) shows the total number of subjects who participated in the quasi-experiment, together with the total number, after excluding absent cases and subjects, who took part in the TAP:

Subjects	Treatment Groups		No feedback	Total no.
	Direct written CF Group	Indirect written CF Group	Control Group	
Total no. of participants	27	27	24	78
Total no. after excluding absent cases	27	26	23	76
Total no. after excluding subjects who participated in the TAP (six per group)	21	20	17	**58**

Table 4.2: Total number of subjects who participated in the quasi-experiment

Accordingly, the total sample size which was used for quasi-experiment analysis was (*n=58*) which is in line with that used by established researchers in the field of written CF research, as can be seen in Table 4.3 (below).

Study	Journal	No. of groups	Sample
Bitchener et al. (2005)	Journal of Second Language Writing	3 groups	53
Bitchener and Knoch (2009a)	ELT	4 groups	52
Bitchener and Knoch (2009b)	System	3 groups	39
Bitchener and Knoch (2010a)	Applied Linguistics	4 groups	52
Bitchener and Knoch (2010b)	Journal of Second Language Writing	4 groups	63

Table 4.3: Sample size used in several published written CF studies

4.4.1.2 Independent and dependent variables

The independent variable of this study was the treatment that the subjects received while the dependent variable was the effect of the treatment on the students' accuracy. The independent variable was manipulated to affect the dependent variable. Figure 4.4 (below) depicts the relationship between the dependent variable and the independent variable.

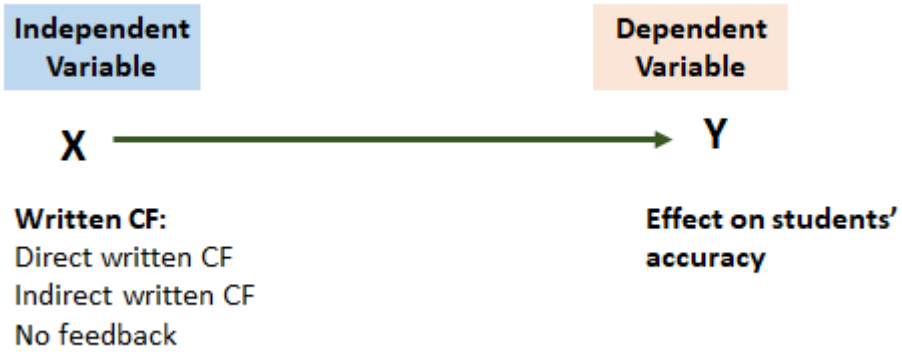

Figure 4.4: Independent and dependent variables of the quasi-experiment

The independent variable had three conditions; treatment 1 was direct written CF, treatment 2 was indirect written CF and the control group had no feedback. Other independent variables were measured in this study: the type of error (comparatives and prepositions of space) and the proficiency level of the students (higher and lower levels). These variables were part of the quasi-experiment design because they provided answers to research questions1a and 1c.

4.4.1.3 Types of treatment

The students involved in this study received two types of treatment: one group received direct written CF and another indirect written CF, while the control group received no feedback. Examples will be given from the students' tests of the two treatments in the following sub-sections.

4.4.1.3.1 Direct written CF

Treatment 1 was direct written CF, where I underlined the errors and provided cursors to indicate missing elements. I provided the correct words above the errors and inserted the missing elements. Figure 4.5 (below) shows a sample of the direct written CF used in this study:

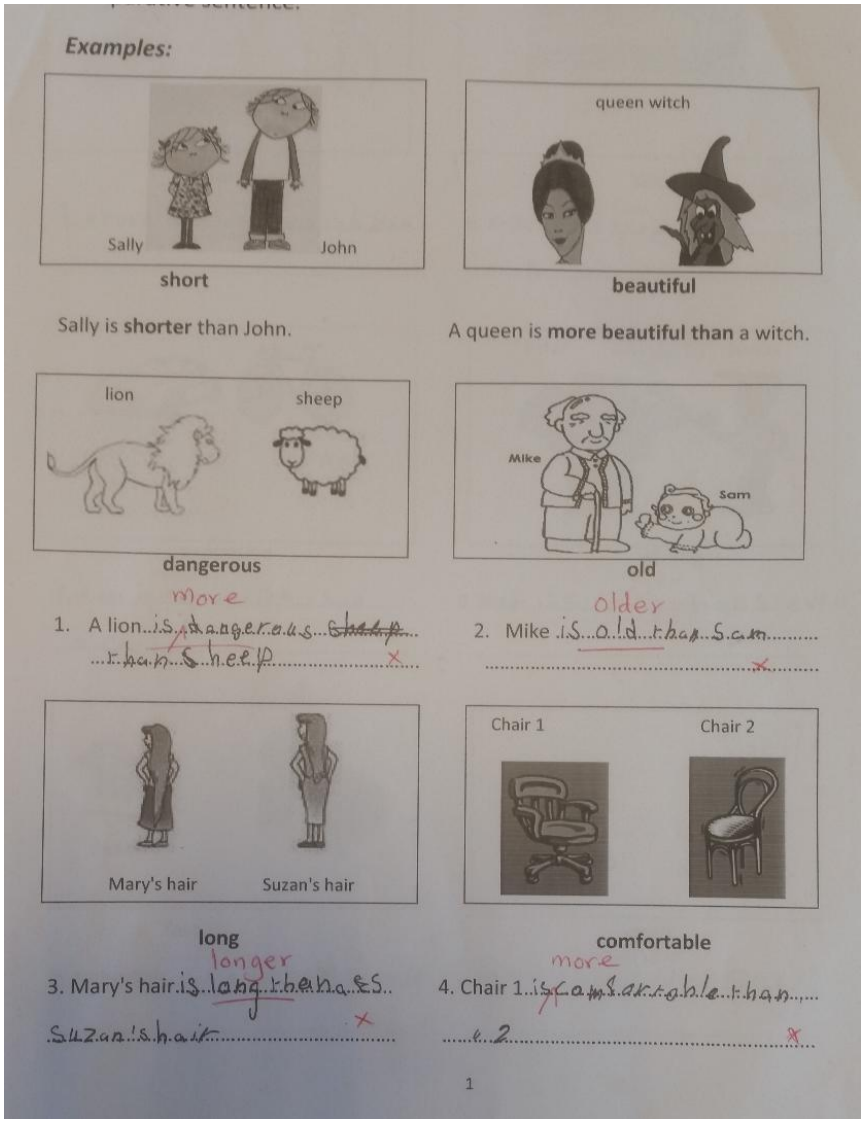

Figure 4.5: Sample of direct written CF

4.4.1.3.2 Indirect written CF

Treatment 2 was indirect written CF, where the researcher indicated an error by underlining it without providing the correction. I used a cursor to indicate missing words but did not provide the corrections. Figure 4.6 (below) shows a sample of the indirect written CF used in this study:

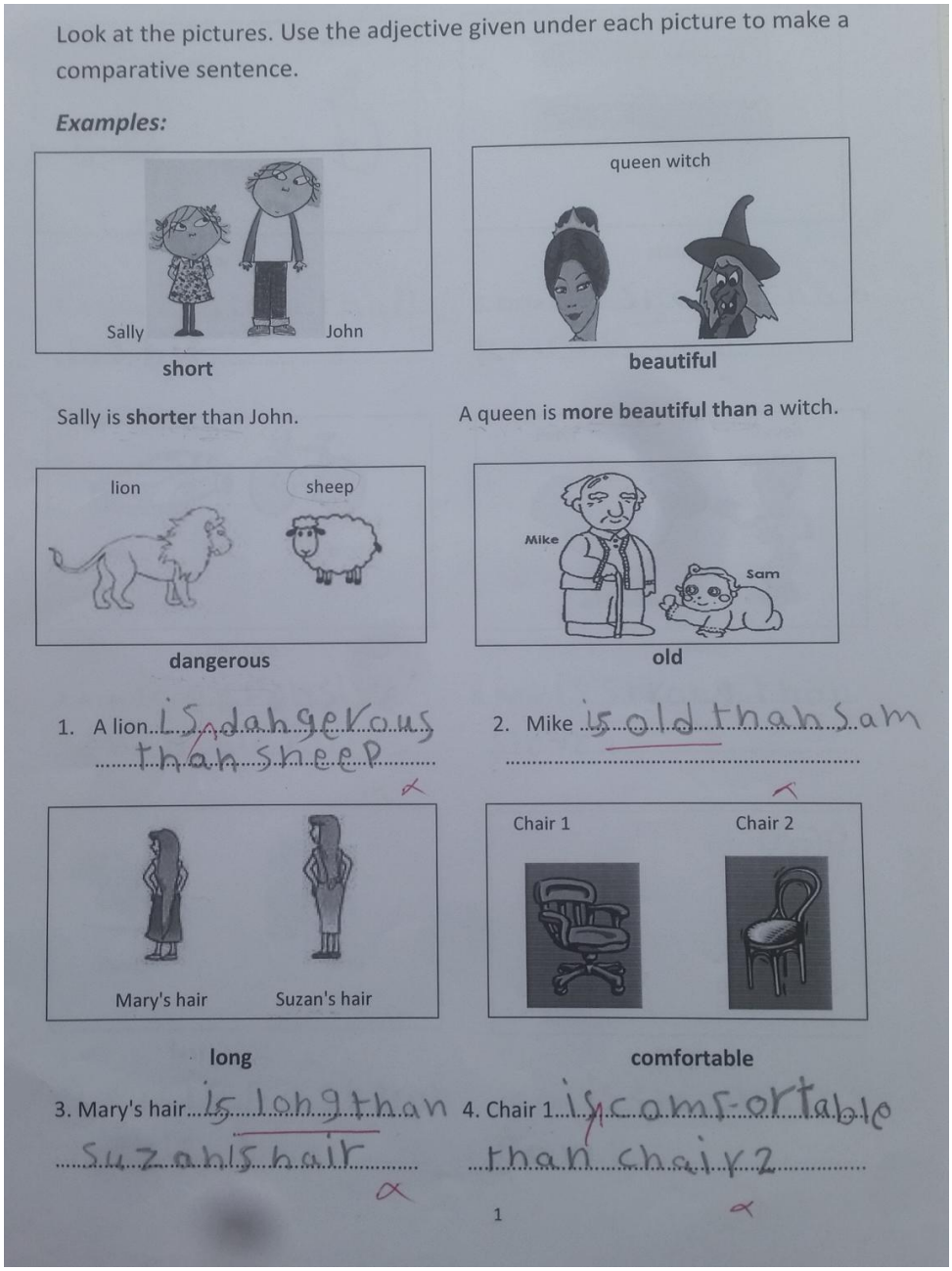

Figure 4.6: Sample of indirect written CF

This study targeted focused written CF, so I provided corrections for the targeted linguistic structures (comparatives/prepositions of space) only while any other errors in the sentences were ignored.

4.4.1.3.3 No feedback (control group)

The control group did not receive any kind of formal treatment. One of the important critiques of the early written CF research was the absence of a control group (Storch, 2010; Bitchener, 2008; Guenette, 2007) which, in quasi-experimental studies, makes it difficult to

ensure that the effect which occurs in the post-tests is due to the treatment given rather than to other extraneous factors or variables (Storch, 2010, p. 32). Therefore, in order to assert a causation relationship, it is necessary to include a control group in a quasi-experimental design (Hudson and Liosa, 2015, p. 85). The quasi-experimental design in this study included a control group which was chosen from the same school as the two treatment groups. The two treatment groups and the control group were all taught by the same English language teacher.

Although the control group did not receive any type of written CF during the data collection, I provided them with copies of their tests containing the direct written CF after the completion of the data collection, to avoid depriving some students from a benefit that had been given to their peers due to ethical commitments.

4.4.1.4 Targeted linguistic structures

As described in Chapter Three, Truscott (1996, p. 343) argues that no single form of feedback is expected to assist the acquisition of all errors. Although there is a growing body of research that supports the effectiveness of written CF on developing learners' accuracy with regard to a number of linguistic structures, different levels of development have been reported (e.g., Ferris and Roberts, 2001, Bitchener et al., 2005). Ferris (1999, p. 6) discussed the 'treatability' of errors, suggesting that some are 'treatable' while others are 'untreatable', because they are idiosyncratic. She suggested that some errors (e.g., verb-tense and form, subject-verb agreement, article usage, plural and possessive noun endings) occur in a "rule-governed" way, while others (e.g., word choice, with the possible exception of some pronoun and preposition uses) are idiosyncratic and so require learners to utilize their acquired knowledge of the language to correct them (Ferris, 1999, p. 6).

To date, the majority of the focused written CF research has targeted very limited types of linguistic structures. Most published written CF research has focused on definite and indefinite articles (e.g., Bitchener et al, 2005; Bitchener, 2008; Bitchener and Knoch, 2008, 2009b, 2010a, 2010b; Ellis et al., 2008; Sheen, 2007; Shintani & Ellis, 2013; Shintani et al., 2014; Stefanou and Ravesz, 2015), the simple past tense (e.g., Bitchener et., 2005; Frear, 2012; Guo, 2015; Rummel, 2014) and prepositions (e.g., Bitchener et al., 2005; Guo, 2015). Researchers recommend that more written CF research is needed on a wider range of linguistic error categories and functional uses (Bitchener and Storch, 2016, p. 56).

This study investigated two linguistic structures; comparatives and prepositions of space. Since this study examined whether the effectiveness of written CF varies according to the type of targeted linguistic structure involved, two linguistic structures were selected, with different degrees of complexity. Comparatives are 'rule-governed' because students can refer to grammatical rules to resolve their errors, while prepositions of space are 'less rule-governed'. Although prepositions of space have some rules, there are exceptions to these rules, so the students are less likely to benefit from using the rules to resolve their errors.

The comparative was targeted because this research aimed to explore rule-governed structures that have not been examined in the written CF research previously, as the majority of the previous research addressed the simple past-tense and definite and indefinite articles ('rule-governed' structures). The comparative was also chosen because this linguistic structure had not yet been introduced to the current study sample (grade six students). Therefore, it is a grammatical item that the students will encounter later and so this research could prove beneficial to them in the long-term.

Prepositions of space had also not yet been introduced to the grade six students, since students in Oman do not learn these formally until grade ten. Another reason for choosing prepositions of space was that they are difficult to learn. Most English learners struggle with using prepositions (Lorincz and Gordon, 2012, p. 1). Bitchener et al. (2005, p. 197) found that 29.23% of the errors committed by students were related to preposition use. Arab EFL/ESL learners have difficulty using prepositions of space due to the different use of prepositions in Arabic and English, respectively (Almaflehi, 2013, p. 259); for example, Arab learners often find it difficult to differentiate between 'in' and 'at' because, in Arabic, the single preposition 'fii/in' is used to express both. Moreover, the Arabic preposition in/'fii' may be used to express 'in', 'on' and 'at' in some cases.

The relative difficulty of the different grammatical structures influences the extent to which they are treatable through feedback (Shintani et al., 2014, p. 108). Targeting two structures (the comparative and prepositions of space) with different degrees of complexity or difficulty made the investigation into the effect of written CF on different linguistic structures more reliable in this study.

4.4.1.5 Writing tests

The majority of the previous research used ready-made writing tasks for the quasi-experiments. The writing tests/tasks used in this study were all designed by me, drawing on extensive feedback from academic staff and doctoral colleagues, to ensure that they were appropriate for the students' level of English. Three tests were used for each linguistic structure (a pre-test, immediate post-test and delayed post-test). The writing was at the sentence level, due to the low proficiency level of the students, as it would be difficult, especially for the medium and low level students of Cycle Two classes (grade 6) to produce a paragraph. Short descriptive sentences are already produced by these students, and so seemed an appropriate choice. Moreover this research targeted focused written CF, so sentence level writing was more appropriate for obtaining higher frequency use of the targeted linguistic structures by the students. The writing tests were supported by pictures to clarify the meaning for the students. I sometimes used local names to make the tests more culturally appropriate, so that the students would be better able to access the meaning.

4.4.1.5.1 The comparative tests

The students were required to produce ten comparative sentences, based on picture clues. There were three tests, that used different adjectives (the pre-test, immediate post-test and delayed post-test). The students wrote new sentences for each task/test (except for the revision, where they revised the pre-test). Each test included some vocabulary (adjectives, names of people and objects) to help the students to produce the sentences. The students were required to use the adjective provided under each picture to produce comparative sentences. Two examples were provided at the top of the page for each task. Appendix A contains an example of the comparative pre-test used for the quasi-experiment and TAP.

In this study I avoided including rules of spelling related to the formation of comparatives; for example, adjectives such as big/bigger, hot/hotter, and happy/happier, where the consonant is doubled or the 'y' converted to an 'i', were not included in the tests. This decision was taken because comparatives were being introduced for the first time and the students may have felt overloaded by the spelling rules related to producing comparatives.

4.4.1.5.2 Prepositions of space tests

The students were required to produce ten sentences using prepositions of space ('in', 'on' and 'at'). Three different tests were used (the pre-test, immediate post-test and delayed post-test), and the students wrote new sentences for each task/test (except for the revision, where they revised the pre-test). Each test included some vocabulary (names of people, objects and places) to help the students to produce the sentences. Two examples were provided at the top of the first page of each task. Appendix B shows an example of the prepositions of space pre-test used for the quasi-experiment and TAP.

4.4.1.6 Procedures

4.4.1.6.1 Proficiency level test

The proficiency test was administered after I received the signed consent forms from the students' parents. It was designed by the researcher and adapted from the Straightforward Beginner and Elementary Placement Test. The names of the people and places were changed to suit Omani culture. I also consulted the course books of students at the previous levels and included materials that had already been covered. I consulted a grade six English teacher as well regarding the appropriateness of the test, which included grammar and vocabulary questions. Since this study investigated grammatical accuracy, it was appropriate to focus on grammar knowledge. Vocabulary was also tested because some earlier research demonstrated that it is a good predictor of learners' overall language proficiency (e.g., Zareva, Schwanenflugel and Nikolova, 2005; Beglar and Hunt, 1999; Van Beuningen et al, 2012). The test consisted of 70 multiple choice items, and lasted 40 minutes (one lesson). A multiple choice test was the most suitable instrument for the tests due to practical and time considerations. It was easy for the students to complete and also practical for me to correct and provide firm scores. The proficiency level test is attached in Appendix C.

All of the students' test papers were corrected by the researcher prior to the data collection. The highest score on the test was around 33/70 for all classes, which indicates that the students found the test challenging. The proficiency level test was administered to provide an indication of the students' overall English language proficiency, for three reasons. First, it ensured that the three classes which participated in the study were almost equivalent in terms of proficiency level before collecting any data, as using inequivalent groups might provide

misleading results. To ensure that the independent variable (written CF) was the only reason for the effect found in the dependent variable (improved accuracy), the three groups had to be equivalent in proficiency level at the beginning of the study. Therefore the proficiency level test ensured that each class (group) included mixed-ability students (of higher, medium, and lower proficiency). The proficiency level test scores for the three classes/ groups are included in Appendix D.

Second, the proficiency level test helped the researcher to select an appropriate sample for the TAP. I documented the students' scores for each class in descending order, then classified them into three groups: higher, medium and lower level proficiency. Based on this classification, I was able to choose the TAP sample (two students from each proficiency level).

Third, the proficiency level of the students was one of the factors that was investigated in this research. Research question 1c examined whether the effectiveness of written CF (indirect CF) varies according to the proficiency level of the students (higher or lower). It was claimed that higher level L2 learners might benefit more from indirect feedback than lower level ones because they possess higher linguistic competence (Ferris, 2004, p.60). The literature on the techniques used in written CF research to classify students according to their proficiency level shows that Van Beuningen et al. (2012) classified their total sample into two groups: a higher level and a lower level group. Using the same approach as Van Beuningen et al. (2012), in this study, the students in each class (group) were classified into two groups, a higher and lower level group, for comparison purposes and to answer research question 1c.

4.4.1.6.2 Teaching the targeted linguistic structures

The targeted linguistic structures in this study (the comparative and prepositions of place) had not been learned by the grade six students. Formally, in Omani public schools, the comparative are taught in grade seven and prepositions in grade ten. In this study, I purposely chose to investigate the effectiveness of written CF on these two new linguistic structures because, to date, almost all of the recent written CF studies have targeted linguistic structures that have already been learned. These studies found significant short- and long-term effects of written CF. Targeting linguistic structures that have already been learned might mean that these structures are already part of the learners' interlanguage system, so it could be argued

that the short- and long-term effects were found because the learners received feedback during the consolidation stage of their L2 knowledge development. There is a gap in the written CF research regarding the effectiveness of written CF in developing new L2 knowledge. One of the current study's aims was to fill that gap by examining the effectiveness of written CF on newly-learned linguistic structures.

Since the targeted linguistic structures had not yet been learned, it was important to teach them to the students first. The linguistic structures (the comparative and prepositions of space) were introduced separately a week prior the students received the pre-test. First, the comparative was introduced. After, I finished collecting data on the comparative, I introduced prepositions of space and the students received tests on this linguistic structure. I introduced the two linguistic structures separately because it would be a heavy load for students to receive instructions on two new linguistic structures on the same day. Moreover, the students received the pre-test on prepositions of space two weeks after they received the pre-test on the comparative, therefore it would be easy for the students to forget about prepositions of space.

The three groups (the direct, indirect and control) received the same amount of instruction on each linguistic structure (the comparative and prepositions of place). Each of the three group received 40 minutes of instruction on each linguistic structure on the same day, a week prior to taking the pre-test. I visited the students in each class. A deductive approach to teaching grammar was used, where I first provided an introduction to the use of the linguistic structure. I presented and explained the grammatical rules, and gave the students some examples, before providing them with some practice of the linguistic structure. I used a deductive approach to teaching grammar, as this approach is commonly adopted by teachers when teaching grammatical rules in Cycle Two Basic Education schools. The lesson plans for teaching the comparative and prepositions of place are attached in Appendixes E and F. The teaching of the grammatical structures was done In English. I followed the same methods used in EFL classrooms in Oman Basic Education schools as teachers are instructed to use English in EFL classrooms. I used some Arabic words to explain some terms such as syllable and comparison.

In this study, the 'newly-learned' structures contributed to the study validity by assuring that the participants were equivalent in the amount of knowledge they had about the linguistic structures at the beginning of the study.

4.4.1.6.3 Treatment

The effectiveness of written CF was measured by means of a pre-test, revision, immediate post-test and delayed post-tests. The outlined procedure for the quasi-experiment for each linguistic structure (the comparative and prepositions of space) was as follows:

Procedure

Week	*Experimental Groups (direct & indirect written CF)*	*Control Group*
Week 1	The researcher briefed the students about the study and gave them consent forms for their parents to sign.	The researcher briefed the students about the study and gave them consent forms for their parents to sign.
	The researcher administered the proficiency level test.	The researcher administered the proficiency level test.
Week 2	The researcher taught the linguistic structure (a 40-minute lesson for each group).	The researcher taught the linguistic structure (a 40 minute lesson for each group).
Week 3	The students sat the 30-minute pre-test.	The students sat the 30-minute pre-test.
	Two days later, the students were given five minutes to look at the written CF on their pre-tests before the papers were taken away. The students were then given 30 minutes to revise their pre-tests on fresh sheets of paper.	Two days later, no written CF was provided. The students were given five minutes to look at their pre-tests, then 30 minutes to revise them before the papers were taken away. The students were given 30 minutes to revise their pre-tests on fresh sheets of paper.
Week 4	The students sat a 30-minute immediate post-test (a new task).	The students sat a 30-minute immediate post-test (a new task).
	Three days later, the students received written CF on their immediate post-tests. The students were given five minutes to look at the written CF on their pre-test tasks.	Three days later, the students received their immediate post-tests but without any written CF. The students were given five minutes to look at their pre-test tasks.

6 weeks after the pre-tests	The students received a 30-minute delayed post-test without being informed about it.	The students received a 30-minute delayed post-test without being informed about it.

Table 4.4: Procedure of the quasi-experiment

In Table 4.4 (above), it can be seen that the quasi-experiment design for this study includes both revision and a new test (an immediate post-test). The immediate post-test was added to the current study's design to avoid flaws in the previous research, where the effectiveness of written CF was measured based on the learners' accuracy in revision only. I followed a sequential technique to collect data on the comparative and prepositions of space. The data were first collected on the comparative, then the same procedure explained in table 4.4 (above) was used to collect the data on prepositions of space.

4.4.1.6.4 Error correction criteria

All error identification and correction were carried out by the researcher. To achieve consistency in error correction, it was important to decide on specific criteria regarding what constituted an error. For the comparative (e.g., A bicycle is cheaper than a car), the students must write 'cheaper than' for this to be coded correct. If they wrote 'cheaper' and misspelled 'than', it was still coded correct. If they wrote 'cheaper' but omitted 'than', it was coded incorrect. If the word 'cheaper' was missing or written in a different form (e.g., 'cheap', 'cheapest'), the sentence was coded incorrect. Any additions to the sentence like 'more cheaper' were unacceptable, as were word order errors. Table 4.5 shows the error correction protocol used for the comparative (adjective_ er + than).

Comparative responses (adjective_er + than)	**Coding**
'A bicycle is cheaper than a car.'	Correct
'cheaper + than', the word 'than' was misspelled (e.g., thn, then, thane)	Correct
The word 'cheaper' was misspelled but with no change of meaning (e.g., cheeper) + than	Correct
One or both of these words 'cheaper' and 'than' were missing	incorrect
The word 'cheap' was written in a different form (e.g., cheap, cheapest, etc.)	incorrect
Using both forms (more cheaper than)	incorrect
Word order (e.g., a bicycle is than cheaper)	incorrect

Table 4.5: Criteria for error correction related to 'er_than'

For sentences with ‘more than’ (e.g., A car is more expensive than a bicycle), the students had to write 'more expensive than' for it to be coded correct. If they wrote 'more expensive' and misspelled 'than', it was still coded correct. If they omitted one or more of the words 'more', 'expensive', or ‘than’, the sentence was coded incorrect. Spelling mistakes in the words 'more' and 'expensive' were acceptable unless these changed the meaning of the words. Table 4.6 (below) shows the error correction protocol used for the comparative (more + adjective + than).

Comparative responses (more + adjective + than)	**Coding**
‘A car is more expensive than a bicycle.’	correct
‘more expensive’ + misspelled the word ‘than’(e.g, thn, then, thane)	correct
The words ‘more’ and/or ‘expensive’ were misspelled but without changing the meaning (eg., mor, expnsive..) + than	correct
One or more of these words ‘more’ ‘expensive’ ‘than’ were missing	incorrect
Using both forms (e.g., more expensiver than)	incorrect

Table 4.6: Criteria for error correction related to ‘more_than’

Prepositions of space (in, on and at) are short words and were provided in the tasks as options, so spelling mistakes were unacceptable. Spelling mistakes, such as ‘at’ for ‘it’ or ‘one’ for ‘on’, changed the meaning of the sentence. If two prepositions were given in a sentence, it was coded incorrect. The omission of prepositions or writing a preposition in the wrong place in the sentence was coded incorrect. Table 4.7 below shows the error correction protocol used to correct the prepositions (in, on and at) tests.

Preposition responses (in, on and at)	**Coding**
The correct preposition, with the right spelling and in the right place in the sentence	correct
Omission of the preposition from the sentence	incorrect
The correct preposition is used but misspelled (e.g., at for it or one for on)/meaning changed	incorrect
Two different prepositions in the same sentence	incorrect

Table 4.7: Criteria for error correction related to prepositions of space

4.4.1.6.5 Coding accurate responses

The students were asked to write ten sentences for each test. Each student was given a score out of ten, and the total number of correct responses for each participant on each test was

transferred from the test papers to an Excel spreadsheet and classified according to the different tests (pre-test, revision, immediate post-test and delayed post-test). The pre-test was to measure the students' accuracy before receiving the treatment. The revision was to measure the students' accuracy when revising the same test (pre-test). The immediate post-test was to measure the short-term learning effect of written CF. The delayed post-test was to measure the long-term learning effect of written CF. The coding of the accurate responses was done separately, according to each targeted linguistic structure (the comparative and prepositions of space). Appendix G shows the coding of the accurate responses across the different comparative tests for the direct CF group.

4.4.1.6.6 Measurement of accuracy

Skehan defines accuracy as (1996, p.23) as "how well the target language is produced in relation to the rule system of the target language". Different procedures were used to measure accuracy in the previous written CF research; for example, Kepner (1991) used the mean number of errors, including morphological, vocabulary, and syntactic errors, other researchers used ratio measures, such as the total number of errors divided by the total number of words in a text (e.g. Ashwell, 2000; Ferris & Roberts, 2001; Chandler, 2003), while yet others used a ratio of error free T-units divided by the total number of T-units (e.g. Robb et al, 1986; Polio et al., 1998). These approaches were used because most of these studies focused on comprehensive error types, where the written CF targeted different types and categories of error (punctuation, sentence structure, morphological, vocabulary and syntactic errors) in a single study.

In studies of written CF (e.g., Bitchener, 2008, Bitchener et al. 2005; Bitcner and Knoch, 2008, 2009b), where the focus was on limited number of linguistic structures, the degree of accuracy was calculated as a percentage of correct usage for each script, giving the range of obligatory occasions arising in each script; for example, in any one script, three correct uses of the targeted linguistic structure from ten obligatory occasions meant a 30% accuracy rate (Bitchener, 2008, p.112).

In some written CF studies, improvement was measured by the increase in accuracy in the revision and post-tests (Bitchener, 2008; Bitchener and Knoch, 008, 2009b, 2010a, 2010b), while in other studies (e.g., Truscott and Hsu, 2008; Van Beuningen et al. 2008, 2012) it was measured by the degree of error reduction in the revision and post-tests.

Since the current study targeted highly-focused linguistic structures (one structure at a time) with a fixed number of sentences (ten sentences per test), it was relatively easy to measure the accuracy. This study used a similar approach to Bitchener (2008), whereby improvement was measured by the degree of increase of accuracy in the revision and post-tests. Accuracy was measured by calculating the percentage of correct usage of the targeted linguistic structure in each script; for example, if a student had six correct uses of the comparatives out of the ten on the script, this meant that she had achieved 60% accuracy in that test.

4.4.1.7 Data analysis

The data obtained from the four writing tests (pre-test, revision, immediate post-test and delayed post-test) of the 58 students were computed using SPSS. The total number of tests included in SPSS for each linguistic structure was 232 (58 x 4).

The pre-tests in the quasi-experiments confirm that the groups were equivalent at the beginning of the study (Hudson and Liosa, 2015, p. 87). A one-way analysis of variance test, ANOVA, was conducted to investigate the between-group differences in the pre-test of the separate linguistic structures (the comparative and prepositions of space) to see if any initial significant difference existed between the groups at the beginning of the study. An ANOVA test was used because it allows an examination of the differences among three or more groups regarding one independent variable, a 'pre-test' (Roever and Phakiti, 2018, p.117). No between-group differences were found in the pre-test for either structure (comparatives P = .073 and prepositions of space P = .610).

To address research question 1 and research sub-questions 1a-1c, tests of the statistical significance were carried out using repeated measures of ANOVA. This test is commonly applied in studies in which the participants receive a pre-test, take a treatment and finally receive one or more post-tests (Roever and Phakiti, 2018, p.154). Therefore, repeated measures of ANOVA were used because this made it possible to investigate the changes in the mean scores at different time points; pre-test, revision, immediate post-test and delayed post-test, as well as investigate the differences in the mean scores under different conditions: direct CF, indirect CF and the control (Roever and Phakiti, 2018, p.154).

An analysis of each linguistic structure was conducted separately since the linguistic structure was a variable that was investigated in this study (research question 1a). In the analysis, tests

(pre-test, revision, immediate post-test and delayed post-test) were used as the 'within-subjects variables'. The different treatment types (direct written CF, indirect written CF and the control group) were used as the 'between-subjects factors'. Tables of descriptive statistics for the means and standard deviations were produced, presented and explained in the analysis chapter. Figures were produced to show the different trends in the groups across the different test times.

Based on the initial repeated measures ANOVA analysis, further post-hoc pairwise comparisons were conducted to look for any significant difference between two specific tests. A one way ANOVA post-hoc comparison was also used to investigate the significant difference between the improvements in the accuracy of the different groups in a specific test.

To address research question 1c, which examined whether the effectiveness of written CF varied according to the proficiency level of students, I conducted comparisons using data on the higher and lower levels in each group.

4.4.1.8 Study validity and reliability

The validity and reliability of the current study was established during the study design and the process of the data collection. Validity is defined as "the extent to which a concept is accurately measured in a quantitative study" (Heale and Twycross, 2015, p. 66). It is concerned with whether a piece of research measured what it was intended to measure (Drost, 2011, p.114).

4.4.1.8.1 Internal validity

Researchers define some common threats to the internal and external validity of quasi-experiment research. Internal validity refers to "the extent to which the results of a study are a function of the factor that the researcher intends" (Mackey and Gass, 2005, p.109). In other words, it is concerned with controlling the extraneous variables and outside influences that could potentially account for the results (Mackey and Gass, 2005). This is important in quasi-experimental studies that attempt to demonstrate causation in order to ensure that the independent variable 'experimental treatment' is responsible for a change in the dependent variable (Mackey and Gass, 2005, p.109).

In order to confirm that the change in the dependent variable was actually caused by the independent variable, the researcher took the necessary steps to ensure that the validity

threats were controlled as far as possible. As mentioned earlier, this study targeted completely new linguistic structures, which means that the students had not received any previous formal input on them. All three classes received the same amount of instruction on each linguistic structure, a week prior to the data collection. All three classes were taught English by the same teacher. The teacher also assured the researcher that she had not provided the students with any further information about the structures. None of the participants was informed about the number and timing of the tests to prevent them preparing for them during the treatment period. The participants came from a provincial town that is located some distance from the capital city, Muscat, so it was unlikely that they received any outside input in English (e.g., from English courses, from their parents at home).

Researchers believe that including a control group strengthens the validity of quasi-experimental written CF research (e.g., Storch, 2010; Bitchener, 2008; Guenette, 2007). The treatment effect is estimated based on the difference between the outcomes of the treatment group and control or comparison group, respectively, so the control group allows a comparison to be made with the other treatment groups and rules out the impact of other extraneous variables (Shadish and Clark, 2003, p.154). It could be argued that including a control group in the current study's quasi-experiment design was essential in order to ensure that the effect on the dependent variable (accuracy improvement) was due to the independent variable (written CF) rather than other extraneous factors.

4.4.1.8.2 External validity

External validity was also essential. It refers to the extent to which the results of a study can be generalised or applied to other members of the larger population being studied (Mackey and Gass, 2005, p.119).

As explained earlier, the sample for the quasi-experiment was not selected randomly. Since second language researchers do not have access to the entire population (Mackey and Gass, 2005), a convenience sample was used, chosen by the researcher, based on the school's willingness to cooperate.

In an attempt to exclude/reduce any bias and extra variables that might affect the findings of the quasi-experiment, I chose a homogeneous sample (three classes) with maximum overlap (e.g., same gender, age, educational level and proficiency level) (Hudson and Liosa, 2015, p.79). The three classes involved in the quasi-experiment were all female, from the same

school, with the same educational level (grade 6) and age (12 years-old). The three classes were taught English by the same teacher. The only way to develop their English knowledge was via formal instruction. It is common that, in Omani public schools, students are placed in mixed-ability classes. The proficiency level test which was administered at the beginning of the study showed that the three classes were almost equivalent. The design of the quasi-experiment included a pre-test which provided additional support for the argument that the three groups were equivalent in terms of English proficiency at the beginning of the study (Hudson and Liosa, 2015, p. 87). Although I selected pre-existing classes, the members of these classes were assigned randomly to the treatment groups.

Therefore, the sample of this study could represent a wide population of Omani EFL students at Cycle Two Basic Education Schools who learn English as a Foreign Language via formal instruction. The sampling technique and quasi-experimental design were chosen to ensure the high validity of the findings.

4.4.1.8.3 Reliability

Reliability refers to the ability of a measure to yield consistent results each time it is used (Drost, 2011). It is concerned with interrater reliability and instrument reliability (Mackey and Gass, 2005). Interrater reliability refers to the relative consistency of the judgments that are made of the same stimulus by two or more raters (Drost, 2011)

In this study, the provision of written CF and coding of the correct responses on all of the test papers was undertaken by the researcher. I collaborated with three trained teachers from the same school to perform an interrater reliability check. I provided them with the correction criteria presented in Sub-section 1.6.4. In total, there were seven cases where my correction diverged from that of the teachers. We discussed the cases and I made the appropriate changes.

The choice of statistical tests was made with the assistance of a statistician from the University of Stirling and the tests were conducted under her supervision. The quasi-experimental analysis was presented to another expert statistician from the University of Stirling for further checking and feedback. He found that I had used appropriate tests to analyze the data.

Instrument reliability was also achieved by collaborating with several staff and doctoral colleagues to determine whether the tests (pictures and sentences) were appropriate or not. The proficiency level test was designed by the researcher to suit the level of the students and be culturally appropriate. The proficiency test was further checked by the class teacher for appropriateness.

4.4.2 The Think aloud protocol (TAP)

The TAP was used to answer research questions 2 and 3. In this section, there will be a discussion of the TAP sample and procedure.

4.4.2.1 Subjects

The sample for the TAP was chosen randomly, using a Random Choice Generator Program, from the whole sample. Six students (2 high, 2 medium, and 2 low proficiency) from each class took part in the TAP.

4.4.2.2 TAP Tasks

Leow et al. (2014, p.115) noted that researchers need to be careful when designing and selecting tasks for TAP to ensure that they are compatible with the think aloud protocol. The tasks used for TAP were similar to those used for the quasi-experiment. Sentence level writing was appropriate because asking the participants to write short paragraphs might overwhelm them and create a "high cognitive load", which might interfere with their verbalization (Ericsson and Simon, 1980). A task which can be broken down into shorter units, so that it can be completed one unit at a time, is recommended for TAP tasks because it avoids overloading the working memory (Charters, 2003, p. 72).

The tasks used in this study can be described as problem-solving, because the students were asked to write sentences based on their knowledge of the grammatical rules; for example, for comparative tasks, the students received written CF on their pre-tests, were given five minutes to process it, and were then required either to revise the same task (revision) or write a new one (immediate post-test). While writing and producing verbal reports, they needed to explicitly reflect back on the relevant grammatical rules and apply these rules to correct their sentences based on the type of written CF they received. I was interested here to explore how the students repaired their errors in response to the different treatments (direct, indirect, no

feedback), and whether the more salient type ‘direct written CF’ would generate more repair with understanding. I was also interested to find out how students cognitively processed the CF.

The tasks used for TAP required cognitively demanding language use, beyond mere word recognition level (Bowles, 2010), as the students were asked to provide explanations of the grammatical rules while processing the written CF and revising their writing. Most importantly, the tasks used provided data for answering research question 2: How do the students repair their errors in response to direct and indirect written CF in their subsequent revision?

4.4.2.3 Warm-up and practice regarding TAP

The participants who completed the verbal reports in this study were given a pre-task orientation and demonstration session. They were briefly provided with explanations on the form and rationale of the verbal reports that they were going to produce in order to reduce the “cold start effect", as suggested by Gibson (1997). Some researchers assume that the participants should not need coaching in TAP but should express their inner dialogue spontaneously; however, I found from the pilot study that it was necessary to demonstrate to the participants how the TAP would be conducted. Therefore, I selected at random three students and demonstrated the TAP procedure with them in front of the other students. The tasks used for this practice differed from those used for the main study, as they focused on different linguistic structures and aspects of language (punctuation and simple present versus present continuous tasks). Appendix H shows these tasks.

Moreover, on the day when the TAP was collected and before each student started to produce her verbal report, clear oral and written instructions were provided to the participants in Arabic to remind them of the procedure and avoid any speculation/misunderstanding regarding the metalinguistic introspective verbal reports that they would produce (Leow et al. 2014, p.115). Before each student started producing verbal reports, she needed to read the instructions for TAP first. Then I asked her orally if the instructions are clear and if she had any questions about the them. I further explained the instructions orally to make sure that each student understood what she was required to do. Appendix I shows the written instructions for TAP.

4.4.2.4 The issue of prompting

In this study, while the students were verbalizing their thoughts, it was necessary to prompt them to continue verbalizing because sometimes they forgot to do so or paused for a short time.

I used the phrases ‘keep talking’ and ‘keep justifying’, in Arabic, to remind the participants to continue talking and providing justifications for the sentences they wrote. To minimize the interruption to the students’ verbal reporting, I sometimes also used gestures to encourage them to continue talking.

I tried to keep the TAP as natural as possible. The TAP data were collected by audiotaping rather than videotaping the participants because the main focus of the verbal reports was the linguistic output which could be obtained from the audiotapes' transcripts. I collected the TAP utterances while sitting next to rather than across from the participants in order to minimize the degree of intimidation.

4.4.2.5 Procedure of the TAP

Table 4.8 (below) illustrates the TAP procedure:

Procedure for the TAP	
Week 1	The researcher briefed the students about the study and gave them consent forms for their parents to sign. The researcher explained that six students from each group would be randomly selected to conduct the TAP. The researcher administered the proficiency level test to the three classes.
Week 2	The researcher taught the linguistic structure (a 40-minute lesson for each class). The researcher provided the TAP participants with training and a demonstration regarding how to produce verbal reports.
Week 3	The students sat a 30-minute pre-test (with the whole class).
	Two days later, each student met the researcher in a small office for TAP1. Each student was provided with oral and written instructions on how to produce verbal reports. Each student was given five minutes to look at her pre-test (written CF/no feedback).

	The pre-test paper was taken away. Each student was provided with a fresh sheet of paper on which to revise the same test. Each student revised her pre-test and produced TAP1.
Week 4	Each student met the researcher in a small office for TAP2. Each student was provided with oral and written instructions on how to produce verbal reports. Each student performed the immediate post-test and produced TAP2.
	Three days later, the students received the treatment (written CF/no feedback) on their immediate post-tests (in class). The students were given five minutes to look at the written CF on their pre-test tasks.
6 weeks after the pre-test	The students were given 30 minutes in which to complete the delayed post-tests, without any prior warning of this (with the whole class).

Table 4.8: The TAP procedure

As explained earlier, the TAP sample was drawn from the whole sample. They went through a similar procedure as the quasi-experiment but differed in that they produced the TAP data while performing the revision and immediate post-test.

4.4.2.6 Language of the TAP

Due to the low proficiency level of the students, they were instructed to produce the TAP in Arabic, and I also used Arabic. The students used a mixture of standard, colloquial Arabic and formal English to produce their verbal reports. English was used mainly when they produced the sentences during the tests and at times for terms such as 'one syllable', 'comparing' and 'er_than'. A mixture of standard and colloquial Arabic was used when making comments, providing justifications and responding to the teacher's questions. The students were asked to complete the TAP in Arabic in order to provide them with a safe space and stress-free environment in which to verbalise their thoughts.

4.4.2.7 Transcription of the TAP

Once I had become familiar with the TAP data through repeated listening to them, I transcribed the entire audio-recordings. I used certain transcription conventions, as listed in Table 4.9 (below):

Key	Use
S5:	Student number
R:	Researcher
Sent. 1 Sent. 2	A number is given to each sentence produced by the student during the introspective TAP.
01 02 03	A numeric is given to each intervention in the retrospective TAP made by a student or researcher.
“ ”	Quotation marks are used for: a word, phrase or sentence produced/ uttered by a student or researcher in English.
[Student provides an accurate, targeted sentence in Arabic]	If a student provides an accurate, targeted sentence in Arabic, it is enclosed between brackets.
…	Used to indicate a short pause.
(silent) (read examples given in the task)	Brackets are used to indicate that a student pauses for a while, and so that the student is reading the examples given in the task.
{fouq} {dakhil}	Arabic translation of terms, for example translation for preposition “on” {fouq} and “in” {dakhil}

Table 4.9: Conventions of the TAP transcription

Appendix J provides a sample of the transcription together with a transcription key.

4.4.2.8 Translation of the TAP

Since a mixture of standard and colloquial Arabic was used by the students, I adopted both literal and free approaches when translating from Arabic into English.

Standard Arabic	English translation	Literal meaning of words	Standard + colloquial Arabic
لأنهم حاليا في باريس.	Because they are in Paris.	Going to	لأنهم هم **رايحين** باريس
لماذا استخدمنا in في هذه الجملة؟	Why we said 'in' in this sentence?	wonder	**عجب ليش** في هلجملة قلنا in
عندما تكون الكلمة مكونة من مقطع واحد نضيف er than	When the word is one syllable we add ' er than'.	day	**يوم** تكون الكلمة مكونة من مقطع واحد نضيف er than
لأننا في هذه الجملة نستخدم صيغة المفاضلة بين السيارة والدراجة الهوائية.	Because we are making comparison between a car and a bicycle.	sitting	عشان احنا هنا **جالسين** نسوي مقارنة بين السيارة والسيكل.

Table 4.10: Examples of utterances that could not be translated literally

Literal translation is designed to translate the original text adequately, keeping the original message form and structure, including the word order, image used and so on, unchanged, while free translation aims to produce an accurate representation of the original text, paying little attention to the form and structure" (Hassan, 2014, p.12). Free translation was used in cases where a literal translation might prove incomprehensible; for example, Table 4.10 (above) includes some colloquial utterances that could not be translated literally because they would distort the meaning and would be incomprehensible to the reader.

4.4.2.9 The TAP analysis

The data from the students' introspective TAPs were transcribed and analyzed. The analysis initially focused on uptake. Uptake, here, means the students' written response that follows the teachers' written feedback and constitutes a written reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial response. In the uptake analysis, I examined how the students repaired their errors in response to direct and indirect written CF. Repair occurs when L2 students successfully repair their errors in the light of written CF and incorporate the corrections into their revised texts (Sheen, 2011, p.8). In this study, a repair is defined as a correct response to an error in a subsequent revision. The study examined whether the sentences were repaired with or without understanding.

The uptake analysis also examined the types of errors that the students committed during their revision and identified any error that 'needs-repair'. Needs repair in this study refers to an inaccurate response to an error in a subsequent revision that needs additional written CF. There were three categories of needs repair: where the students committed the 'same error' as in their initial task (pre-test), where they committed a 'different error' than that in their pre-test, or where they produced 'a new error'. A new error is a linguistic structure which was used accurately in the pre-test but inaccurately in the revision.

As explained earlier in this chapter, I collected TAP data from each student twice: once during the revision and again when she was performing the immediate post-test. The TAP data regarding the revisions were only used to conduct an uptake analysis. Since the students performed the same task in both the pre-test and the revision, I was able to track the changes (repair and needs repair) that the students made during their revision. In the immediate post-test, the case was different, as the students performed a different task compared to the pre-test, so it was difficult to track the changes that they made in the immediate post-test. More

details about the uptake scheme of coding are provided in Chapter 6 (TAP analysis and findings).

In the retrospective TAP, I negotiated written CF with students using a way similar to the one used by Nassaji (2011) and Al Jaafreh and Lantolf (1994), that is, a guided help was used where I provided implicit to explicit support to individual students. The retrospective TAP was conducted to explore further whether the students understood the grammatical rules or not, because some students failed to provide justifications in their introspective TAP. It was also used to understand why some students failed to benefit from written CF in their subsequent revisions.

4.5 Ethical considerations and study limitations

4.5.1 Ethical considerations

The ethical issues related to the study and the procedures advised by BERA and the University of Stirling were considered. Permission to conduct this study was sought from the University of Stirling's Ethics Committee. Since this study took place in Omani public schools, permission from the Ministry of Education was obtained as well in order to obtain access to the schools supervised by the Ministry.

The school principal, where the study was implemented, was approached by the researcher. Once the principal had granted permission, the Senior English Teacher (SET) and English class teacher were then approached and briefed about the study. Explanations of the aim, focus, methods and procedures of the study were provided. They were assured that anonymity and confidentiality were top priorities and they were free to withdraw from this study at any time. I explained also that the data collected from the sample would be used solely for the purpose of the study and that a summary of the study findings would be sent to the school, if they wished. They received information sheets containing details about the data collection's purpose and procedure and were asked to sign consent letters. An ongoing informed consent procedure was applied, whereby I repeatedly reminded the participants about their right to withdraw from the research at any point, if they wished.

For the students, I explained the purpose of the study and their role as participants. They were informed that some students would be selected randomly to conduct the TAP. Consent letters in Arabic were sent to their parents to sign. Throughout the process of the data collection, I ensured that the students wished to proceed with the research. For the analysis, the students were given reference numbers (e.g. S1, S2) to protect their identity. The paper format of the data was kept in a locked cabinet in the researcher's office in the faculty, in line with the General Data Protection Regulations of the University of Stirling. The signed consent forms of the school principal, SET, class teacher and parents are provided in appendixes K-L-M-N.

Conducting research in educational settings can prove challenging, as the competing demands of research, teaching and learning raise significant ethical issues (Konza, 2012, p.77). One of the ethical issues that I faced was how to access the students during the school day, and whether this would affect their class and syllabus timeline? I discussed this issue with the school principal, SET and English class teacher. The school agreed to provide me with a timetable of the classes to be used for the data collection, which were compensated for by 'substitution classes', which are available because a teacher is absent for some reason. The teachers who missed classes because of the study's intervention were compensated by being offered these classes to teach instead.

Using TAP raised considerable issues for this study as well. During the pilot study, the students expressed their dislike of the fact that I would select only some students to perform the TAP. They explicitly discussed this with me as they felt that the TAP students were being privileged in some way and so questioned the procedure used to select those students, which inspired me to seek a way whereby all of the students would have an equal opportunity to be selected for the TAP. A Random Choice Generator program was used to select the TAP students for the main study and the students were informed of this. To include as many students as possible in the TAP in the main study, those who completed the TAP regarding the comparative were different from those who completed the TAP regarding prepositions.

The fact that the selected students left their class in order to conduct the TAP raised another ethical issue. Prior to the data collection, I discussed this issue with the school principal and SET. The school principal sent a letter to the teachers requesting their permission for individual students to meet me to conduct the TAP. The teachers were also kindly asked to

cooperate in explaining any new materials that were missed by those students while engaged in the TAP.

Another ethical concern was linked to the control group, who received no feedback during the quasi-experiment. Was it ethical to withhold a benefit from a certain group of students for the sake of achieving my study's aims? Accordingly, after the data collection process finished, I sent photocopies of the control groups' pre-tests and immediate post-tests with direct written CF.

4.5.2 Study limitations

Although this study provided a deep understanding of the effectiveness of direct and indirect written CF on newly-learned rule-governed structures and less rule-governed structures regarding Omani EFL students, it has some limitations. The first limitation is that this study targeted totally 'newly-learned' linguistic structures, so the findings cannot be generalised to studies that targeted almost acquired or 'already learned' linguistic structures, as this study examines the effectiveness of written CF in developing new L2 knowledge.

Another limitation is that the sample of this study was young, female Cycle Two Basic Education students in a provincial region. It was highly likely that their only way of learning EFL was via formal instruction at school. The participants were less likely to receive any extra input outside school (e.g., parents, the internet, nannies and English courses). Therefore, the results of the study were generalizable mainly to students learning English in similar contexts, but not to those in the capital city or at private schools.

The results could also not be generalized to male Omani EFL students, as gender could be considered a variable in EFL learning, nor to adult learners at high schools or colleges, since the L2 learning strategies employed by young EFL/ESL learners might differ from those used by adult EFL/ESL ones; for example, Munoz (2007) mentioned that young learners rely more on their memory than on analysis, as they adopt a memory-oriented approach to language processing. Adults, on the other hand, tend to use their analytical ability when processing a language (Munoz, 2007, p. 231-232).

The sample size for the quasi-experiment might be another limitation of this study. A total sample of (n=58) was convenient but using a larger sample might increase the statistical

power of the quasi-experiment. Hudson and Liosa (2015, p.91) point out that any test statistic will be significant if the sample size is sufficiently large. This point should be considered in future research investigating the causal relations of written CF.

To conclude, Chapter four provided a detailed explanation of the research philosophical view, approach and methods. It discussed the implications of the pilot study for the main study, and it provided detailed information on procedures of the quasi-experiment and TAP data collection and analysis. It also discussed some ethical issues that have been considered throughout the implementation of the study and highlighted limitations of the current research. Chapter five discusses quasi-experiment analysis and findings, while Chapter six discusses TAP analysis and findings of the TAP.

CHAPTER FIVE

Analysis and findings regarding the quasi-experiment

5.1 Introduction

As explained in Chapter 4, the quasi-experiment was conducted to find answers to confirmatory questions. In this chapter, the quasi-experiment analysis and findings are presented. The findings for each research question (research question 1 and sub-questions 1a, 1b and 1c) are presented and explained.

Research question 1 examines whether written CF on newly-learned linguistic structures is effective in revision and whether it has both a short- and long-term learning effect. The short-term learning effect was measured by the students' performance in a new piece of writing, via an immediate post-test. The long-term effect was measured by the students' performance in a delayed post-test.

Research sub-questions 1a, 1b and 1c examine some of the moderating factors that may impact on the effectiveness of written CF (type of errors, type of written CF and the proficiency level of the students). These questions were formulated based on the theoretical foundations of written CF, discussed in Chapter 2. Research question 1a examines whether the effectiveness of written CF varies according to the type of linguistic structure; rule-governed (comparatives) and less rule-governed (prepositions of space). Research question 1b examines whether the effectiveness of written CF varies according to the type of feedback (direct or indirect written CF). Research question 1c investigates whether the effectiveness of indirect written CF varies according to the proficiency level of the students (higher versus lower level).

5.2 Analysis and findings regarding the quasi-experiment

The data obtained from the quasi-experiment were analyzed using a repeated measures ANOVA to test for between-group differences. As explained in the methodology chapter (section 1.6.6), each student's score for each test was recorded. The students were required to produce ten sentences for each task, so each structure had to be employed ten times in each task. Following Bitchener (2008), the accuracy was calculated as a percentage of the correct

usage of the total obligatory use in each task. For example, in a task, six correct uses of the targeted linguistic structure out of ten means a 60% accuracy rate. The percentages of the accuracy of each student in each test were used to conduct an analysis using the Statistical Package for the Social Sciences, SPSS. This analysis was conducted to answer:

RQ1. Does written CF help Omani EFL students to improve their grammatical accuracy of newly-learned linguistic structures during revision and in new writing over time?

To address research question 1, the treatment was added to the ANOVA as an independent variable (between-subjects factor). The performance of the students on the different tests (pre-test, revision, immediate post-test and delayed post-test) was added as a dependent variable (within-subjects variable). This question examined the effectiveness of written CF in improving the grammatical accuracy of the students during revision. It also examined the short- and long-term effect of written CF. In order to answer research question 1 and the three sub-questions, an analysis of each linguistic structure was conducted separately.

5.2.1 Analysis & findings regarding the comparative

The performance of the three groups (direct CF, indirect CF and the control group) with regard to the comparative was compared across the four testing points (pretest, revision, immediate post-test and delayed post-test) using a repeated measure ANOVA. Mauchly's Test of Sphericity was violated, and the F values were corrected using a Greenhouse-Geisser adjustment (Bitchener, 2008, p.112). The violation of sphericity is serious for the repeated measures ANOVA, with violation causing the test to become too liberal (i.e., an increase in the Type I error rate). Therefore, determining whether sphericity has been violated is very important. Luckily, if violations of sphericity do occur, corrections have been developed to produce a more valid critical *F*-value (i.e., reduce the increase in Type I error rate). This is achieved by estimating the degree to which sphericity has been violated and applying a correction factor to the degrees of freedom of the *F*-distribution (Lane, 2016). The repeated measure ANOVA test revealed no significant difference between the accuracy scores across the four tests ($F = 1.32$; d.f. = 4.54, 124; $p = .263$). Table 5.1 (below) shows the descriptive statistics for the comparative tasks across the four tests.

Targeted linguistic structure: the Comparative

Groups	N	Pre-test		Revision		Immediate post-test		Delayed post-test	
		M	*S.D.*	*M*	*S.D.*	*M*	*S.D*	*M*	*S.D*
1.Direct written CF	21	68.09	34.44	75.23	32.95	75.71	30.58	41.90	36.41
2.Indirect written CF	20	45.00	42.85	55.00	42.11	56.50	47.27	37.00	37.85
3.Control	17	40.00	43.30	51.17	47.15	48.82	44.56	34.70	37.93

Table 5.1: Means and standard deviations by group and test time (the comparatives)

The repeated measures ANOVA, post-hoc pair wise comparisons revealed a significant difference between the pre-test and revision scores (p = .034), a significant difference between the pre-test and delayed post-test (p = .017), and no significant difference between the pre-test and immediate post-test (p = .108). There was also a highly significant difference between the immediate post-test and the delayed post-test (p = .000). Figure 5.1 (below) shows the performance of the three groups over the four test points.

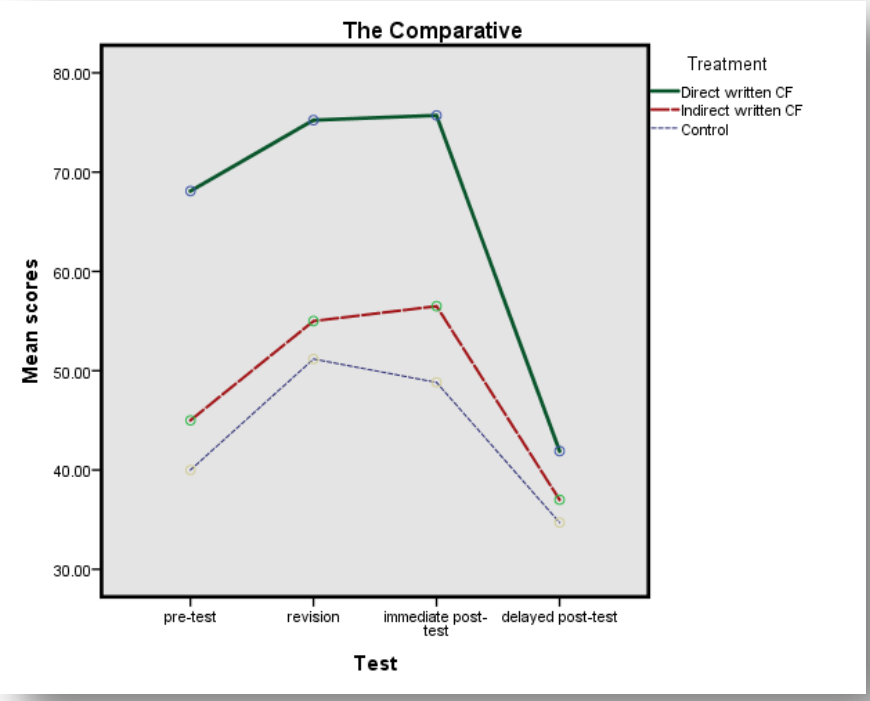

Figure 5.1: Performance by the three groups over time with regard to the comparative

In the previous paragraph, significant differences between two tests are discussed for the three groups regarding the comparative. Repeated measures ANOVA post- hoc pair wise comparisons were used to find out whether there is any significant difference between two tests for each group, as shown in table 5.2 (below).

	Pre-test Revision	Pre-test Immediate post-test	Pre-test Delayed post-test	Revision Immediate post-test	Immediate post-test Delayed post-test
Direct written CF	(p = .163)	(p = .107)	(p = .001)	(p = .853)	(p = .000)
Indirect written CF	(p = .094)	(p = .198)	(p = .208)	(p = .778)	(p = .033)
Control Group	(p = .106)	(p = .152)	(p = 550)	(p = .361)	(p = .043)

Table 5.2: Differences between two tests for each group (the comparative)

Table 5.2 (above) shows that, for the direct written CF group, there is a significant difference between the pre-test and the delayed post-test (p = .001), and between the immediate post-test and the delayed post-test (p = .000). For the indirect written CF group, there is a significant difference between the immediate post-test and the delayed post-test (p = .033). For the control group, there is a significant difference between the immediate post-test and the delayed post-test (p = .043).

Figure 5.1 (above) shows that the performance of the direct and indirect written CF groups increased in the immediate post-test. However, table 5.2 (above) shows that there is no significant difference between the pre-test and the immediate post-test, and between revision and the immediate post-test for neither treatment groups (direct written CF group and indirect written CF group).

Figure 5.1 (above) also shows that the performance of each group declined in the delayed post-test. However, data in table 5.2 (above) shows that there is a significant difference between the pre-test and the delayed post-test for the direct written CF group only (p = .001). This result might be explained by the high performance of the direct written CF group in the pre-test. As it can be seen in table 5.1 (above), that the mean score of the direct written CF group (68.09) is higher than the mean scores of the indirect written CF group (45.00) and the control group (40.00). So the direct written CF group started at a higher point than the other two groups. Nevertheless, the direct written CF group performance declined steeply in the delayed post-test to almost a similar level of decline as that of the indirect written CF group

and the control group. This might explain why the direct written CF has significant difference between the pre-test and the delayed post-test.

Although One Way ANOVA tests show no between-groups differences in the pre-test (p = .073), the direct written CF group mean score in the pre-test (68.09) is higher than the other two groups (direct written CF group 45.00 and control group 40.00). This result raises the question of why the direct written CF group started at a higher point than the other two groups. As a researcher I considered all of the issues and threats that might affect the validity of the quasi-experiment. The three classes took part in this study were assigned randomly to groups. The proficiency level scores were almost the same in the three groups. The three groups received the same amount of instruction regarding the targeted linguistic structure a week prior the pre-test. A possible explanation for the higher performance of the direct written CF group in the pre-test might be due to something happened during the process of data collection. Another possible explanation might be that the performance of the direct written CF group was higher because of chance.

One way ANOVA post hoc comparisons was used to find out whether there is a significant difference between two groups in each test as illustrated in table 5.3 (below).

	Pre-test	Revision	Immediate post-test	Delayed post-test
Direct written CF group Indirect written CF group	(p = .213)	(p = .351)	(p = .421)	(p = 1.000)
Direct written CF group Control group	(p = .109)	(p = .226)	(p = .150)	(p = 1.000)
Indirect written CF group Control group	(p = 1.000)	(p = 1.000)	(p = 1.000)	(p = 1.000)

Table 5.3: Differences between two groups in each test (the comparative)

Results in table 5.3 (above) show that there is no significant difference between the direct written CF group and the indirect written CF group in each of the four tests (pre-test, revision, immediate post-test and delayed post-test). There is no significant difference between the direct written CF group and the control group in each of the four tests. There is also no significant difference between the indirect written CF group and the control group in each of the four tests. However, the results of the treatment groups and the control group in

the immediate post-test are interesting, see figure 5.1 (above). Despite the fact that there is no significant difference between the performance of each of the treatment groups and the control group in the immediate post-test, the treatment groups' performance increased, while the performance of the control group declined. This point will be explained in more details in sub-section 5.2.1.2 (below).

5.2.1.1 Revision effect

The repeated measures, post-hoc pair wise comparisons revealed a significant difference between the pre-test and revision scores ($p = .034$). Regarding the performance of the students on the comparative tasks, Figure 5.1 (above) shows that the group which received direct written CF and indirect written CF, respectively, increased their accuracy during revision. The one way ANOVA post hoc comparisons show no significant difference between the direct group and the indirect group in terms of accuracy improvement during revision ($p = .351$). This means that both methods of feedback were equally effective. This result was surprising. It was expected that direct CF would help the students to improve their accuracy more than the indirect CF during revision because, in the former, the students had their errors underlined and corrections were provided while, in the indirect CF, errors were only underlined without any provision of corrections. This result might indicate that indirect written CF on rule-governed errors (the comparative) had the potential to help the students to improve their accuracy because the students could refer to the grammatical rules when processing the feedback. Another possible explanation is that, because the feedback is highly focused, it may have not been difficult for the students to process the indirect CF when revising their writing.

It was striking that the control group, which received no feedback, also increased their accuracy during revision. The increase in the accuracy of the control group during revision could be related to the effects of the revision process. Van Beuningen et al. (2012, p. 10) pointed out that it might be possible that learners benefit from having a critical look at their writing (the process of revision) even if they have not received any written CF from their teacher. Another possible reason for the improvement in the accuracy of the control group was that they might have received some feedback from their friends in higher level classes in the school (on their performance in the pre-test) before receiving their treatment and revision.

Comparing the accuracy in the improvement of the treatment groups to that in the control group during revision, no significant difference was found between each treatment group and the control group, as presented in Table 5.4 (below):

Groups	Significant difference	P value
Direct written CF > Control	No	p = .226
Indirect written CF > Control	No	P = 1.00

Table 5.4: Significant differences between the two treatment groups and the control group during revision (the comparative)

For the comparative, an effect for written CF on revision cannot be claimed because the control group also improved.

5.2.1.2 Short-term learning effect (new task-immediate post-test)

The results for the comparative show that both the direct and indirect written CF groups, respectively, improved their accuracy during revision (regardless of the fact that the control group also improved). However, Truscott (2007) argues that improved accuracy during revision can signal that learning has only been initiated and that, in order to determine whether or not the learning process has begun, it is necessary to provide learners with an opportunity to write a new task. Therefore, in the context of the current study, to establish whether the learning process had begun or not, it was important to examine the students' performance on the immediate post-test, in which they performed a new writing task using the same targeted linguistic structure.

Although there was no significant difference between the pre-test and the immediate post-test across the three groups (p = .108), the results show some difference between the groups. As illustrated in Figure 5.1 (above), the level of accuracy for the direct written CF group and the indirect written CF group increased in the immediate post-test, while it decreased for the control group. The retention of accuracy for the direct group and the slight increase in accuracy for the indirect group versus the slight decrease in accuracy for the control group might indicate that there was a positive effect because of the treatment (direct and indirect written CF) and that the learning process had just begun.

Although the results show no significant difference between the immediate post-test and the pre-test, the results of students in the immediate post-test in the comparative are interesting.

The results show that the direct written CF group and the indirect written CF group benefited from the written CF they received during revision while the lack of written CF for the control group affected the students' performance negatively in the immediate post-test. The increase of accuracy of the direct written CF group and the indirect written CF group show that there was some short-term learning effect of written CF.

5.2.1.3 Long-term learning effect (new task-delayed post-test)

The results show that there was a significant difference between the accuracy of the three groups in the delayed post-test ($p = .017$). As illustrated in Figure 5.1 (above), the improvement in the direct and indirect written CF groups (in the immediate post-test) was not retained in the delayed post-test. Instead, all three groups' accuracy declined in the delayed post-test. Over a period of six weeks, the accuracy of the indirect group declined while that of the direct group declined steeply in the delayed post-test, their new score in both cases falling below their pre-test score.

The decline in accuracy among the three groups in the delayed post-test might indicate that the students easily forgot what they have learned because there was no reinforcement during the period between the immediate post-test and the delayed post-test with regard to the targeted linguistic structure. Reinforcement here means that the students have an opportunity to practice the linguistic structure in their writing and receive more treatment (more episodes of written CF).

The students' comparative writing tasks in the delayed post-test show that the majority of their errors followed certain patterns. Some students used no comparative forms in their tasks for the delayed post-test (e.g. “A lion is dangerous a sheep”), which might indicate three things. The first is that those students easily forgot the rules and how to use the linguistic structure so that, once they received another episode of written CF (direct or indirect), their knowledge of the linguistic structure might be reactivated.

The second is that certain low level students may have a serious problem regarding understanding the comparative and may not yet have internalized the grammatical rules and use of this linguistic structure. They benefited neither from the one lesson of instruction on the comparative nor the two written CF episodes they received. This might suggest that, if those students continue to receive further episodes of the same written CF strategies (direct

and indirect), they might not benefit from them, and require instead more explicit types of written CF (e.g. direct CF plus oral meta-linguistic CF or scaffolded CF), where the rules and use of the comparative are re-explained, with some controlled practice.

Third, in some scripts for the delayed post-test, the students' performance suggested that they understood the comparative but were confused about how to use it accurately. For example, some students over-generalized the use of one form over the other (using "er_than" instead of "more_than" or "more_than" instead of "er_than") or used both forms in the same sentence (e.g. "A queen is more beautifuller than a witch"). These error patterns might indicate that the learning process has only just begun, as the students might still be in the modification stage of L2 development where they are testing a hypothesis, and structuring and restructuring their L2 knowledge (the comparative). In this case, it could be argued that more written CF episodes of (direct and indirect) might help the students to confirm or reject their hypothesis, especially in the case of the current study, where the comparative was introduced for the first time. For example, if a student received another episode of written CF on her delayed post-test, she would have an opportunity either to confirm or reject her hypotheses. If the old hypotheses was rejected, the student might create a new hypotheses, which requires confirmation or rejection based on a further written CF episode (Gass, 1997).

In the case of this study, it can be argued that two episodes of written CF were insufficient to bring about long-term learning regarding how to use new linguistic structures. It is possible that, had the students received reinforcement during the period between the immediate post-test and the delayed post-test, where they practiced the linguistic structure in their writing, and received more episodes of written CF, their long-term accuracy might have been more positive. Therefore, the long-term effect might be better captured from longitudinal studies, where the students receive a series of written CF episodes on the same linguistic structure (Bitchener and Storch, 2016).

5.2.2 Analysis and findings regarding prepositions of space

For the preposition tasks, the performance of the three groups was assessed across the four testing points (pretest, revision, immediate post-test and delayed post-test). Mauchly's Test of Sphericity was violated, and the F values were corrected using the Greenhouse-Geisser adjustment. The repeated measure ANOVA test revealed a statistically significant difference in the accuracy scores across the four tests ($F = 4.54$; d.f. = 5.55, 152; $p = .000$). Table 5.5 (below) shows the descriptive statistics for the preposition tasks.

Targeted linguistic structure: Prepositions									
Groups	N	Pre-test		Revision		Immediate post-test		Delayed post-test	
		M	*S.D.*	*M*	*S.D.*	*M*	*S.D.*	*M*	*S.D.*
1.Direct written CF	21	51.90	11.67	63.80	22.24	51.90	8.72	55.71	19.89
2.Indirect written CF	20	47.50	19.43	54.00	22.57	45.50	13.56	62.00	15.42
3.Control	17	51.17	12.18	44.70	13.28	51.76	14.24	70.00	16.58

Table 5.5: Means and standard deviations by group and test time (prepositions)

The post-hoc pair wise comparisons revealed no significant difference between the pre-test and revision (p = .984) and no significant difference between the pre-test and the immediate post-test (p = 1.000), but a significant difference between the pre-test and the delayed post-test (p = .000) and the immediate post-test and the delayed post-test (p = .000), respectively.

In the previous paragraph, significant differences between two tests are discussed for the three groups regarding prepositions of space. Repeated measures ANOVA post- hoc pair wise comparisons was used to find out whether there is any significant difference between two tests for each group, as shown in table 5.6 (below).

	Pre-test Revision	Pre-test Immediate post-test	Pre-test Delayed post-test	Revision Immediate post-test	Immediate post-test Delayed post-test
Direct written CF group	(p = .031)	(p = 1.000)	(p = .455)	(p = .022)	(p = .437)
Indirect written CF group	(p = .263)	(p = .666)	(p = .001)	(p = .108)	(p = .000)
Control Group	(p = .029)	(p = .868)	(p = .002)	(p = .055)	(p = .001)

Table 5.6: Differences between two tests for each group (prepositions of space))

The results show significant difference between the pre-test and revision for the direct written CF group (p = .031) and for the control group (p = .029). As it can be seen in Figure 5.2 (below) the performance of the direct written CF group increased in revision, while the performance of the control group decreased in revision. No significant difference was found between the pre-test and the immediate post-test for the three groups (direct written CF group (p = 1.000); indirect written CF group (p = .666) and the control group (p = .868)). There is a significant difference between revision and the immediate post-test for the direct written CF group (p = .022) and the control group (p = .055). The performance of the direct written CF group declined to a level as their performance in the pre-test. The performance of the control group increased to a level as their performance in the pre-test.

There is a significant difference between the pre-test and the delayed post-test for the indirect written CF group (p = .001) and the control group (p = .002). There is also a significant difference between the immediate post-test and the delayed post-test for the indirect written CF group (p = .000) and the control group (p = .001). The indirect written CF group and the control group increased accuracy in the delayed post-test as it is illustrated in Figure 5.2 (below).

One way ANOVA post hoc comparisons were used to find out whether there is a significant difference between two groups in each test as illustrated in table 5.7 (below).

	Pre-test	Revision	Immediate post-test	Delayed post-test
Direct written CF group Indirect written CF group	(p = 1.000)	(p = .376)	(p = .301)	(p = .765)
Direct written CF group Control group	(p = 1.000)	(p = .016)	(p = 1.000)	(p = .046)
Indirect written CF group Control group	(p = 1.000)	(p = .505)	(p = .381)	(p = .514)

Table 5.7: Differences between two groups in each test (prepositions of space)

Table 5.7 (above) shows no significant difference between the direct written CF group and indirect written CF group in the pre-test (p = 1.000). There is no significant difference between the direct written CF group and the control group in the pre-test (p = 1.000). There is also no significant difference between the indirect written CF group and the control group in the pre-test (p = 1.000).

There is a significant difference between the direct written CF group and the control group in revision (p= .016), whereas no significant difference was found between the indirect written CF group and the control group in revision (p =.505). Both treatment groups increased accuracy in revision, and no significant difference was found between the direct written CF group and the indirect written CF group in revision (p = .376).

There is no significant difference between the direct written CF group and the control group (p = 1.000), or between the indirect written CF group and the control group (p = .381) in the

immediate post-test. There is also no significant difference between the direct written CF group and the indirect written CF group in the immediate post-test (p = .301).

The performance of the three groups increased in the delayed post-test, see Figure 5.2 (below). One way ANOVA post hoc comparisons show that there is a significant difference between the direct written CF group and the control group (p = .046). No significant difference was found between the indirect written CF group and the control group in the delayed post-test (p = .514). No significant difference was found between the direct written CF group and the indirect written CF group in the delayed post-test (p = .765).

5.2.2.1 Revision effect

The results of the preposition tasks differed from those of the comparative tasks. The accuracy of both treatment groups (direct written CF and indirect written CF) increased during the revision, while that of the control group substantially decreased, as illustrated in Figure 5.2 (below):

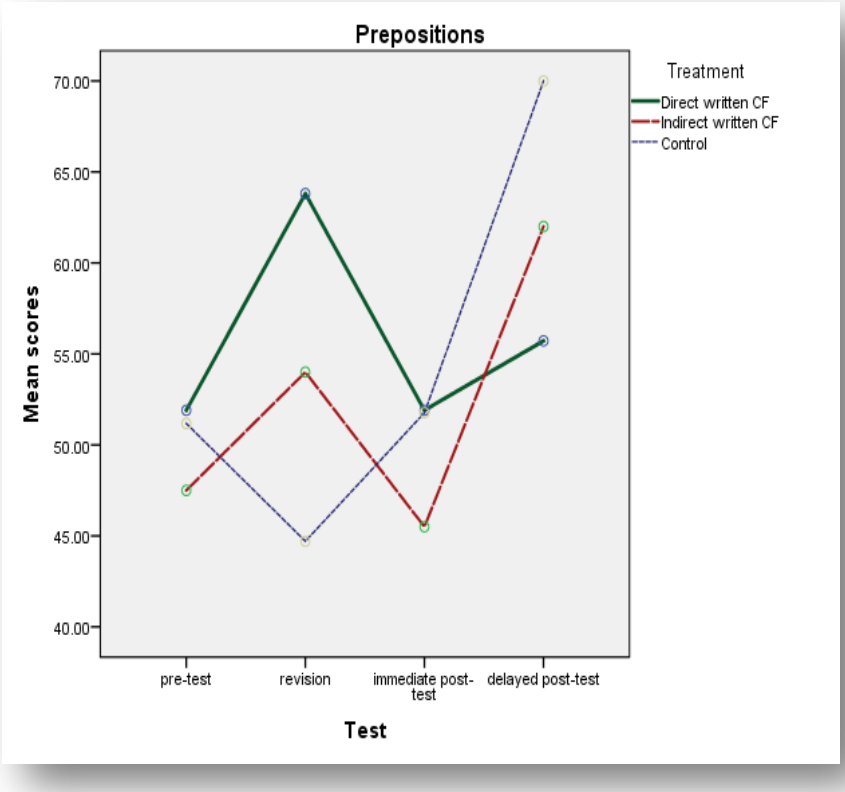

Figure 5.2: Performance by the three groups over time regarding prepositions of space

The one way ANOVA post hoc comparisons revealed that there was a statistically significant difference between the direct written CF group and the control group with regard to revision ($p = .016$), but no statistically significant difference was found between the indirect written CF group and the control group ($p = .505$). The lack of a statistically significant difference between the indirect written group and the control group does not mean that there was no difference at all. The indirect written CF group, as illustrated in Figure 5.2 (above), also increased their accuracy during revision and a further one way ANOVA post hoc comparison revealed that there was no statistically significant difference between the direct written CF group and the indirect written CF group ($p = .376$).

For the control group, the sharp decline might indicate how difficult the students found it to revise the task without the help of written CF. The control group might have felt confused and lacked confidence about their performance in their first tasks, and so may have made changes during their revision, which resulted in a sharp decline in their performance.

5.2.2.2 Short-term learning effect (new task-immediate post-test)

The results for the students' performance on the immediate post-test were interesting. The performance of the direct CF group declined in the immediate post-test to their previous level (pre-test), while that of the indirect CF group further declined to a level lower than that of their performance on the pre-test. Therefore, the improved accuracy during revision was not evident in the subsequent, new preposition task for either the direct or indirect groups. This result is similar to that found in studies (e.g. Truscott and Hsu, 2008) that reported accuracy improvement in their treatment groups during revision but not during a subsequent, new task. The performance of the control group on the immediate post-test was similar to that on their pre-test.

The results for the preposition tasks differ from those of the comparative tasks during revision. For the latter, the improved accuracy in revision was retained on the immediate post-test for the direct CF group, and was slightly increased on the immediate post-test for the indirect CF group while, for the preposition tasks, the improved accuracy in revision for the direct CF group declined on the immediate post-test to the level of the pre-test, and declined even further for the indirect CF group. Therefore, improved accuracy during revision was evident in the new writing task only for the comparative and not for prepositions. This result might be due to the fact that prepositions are less-rule governed. Although prepositions of space have rules, there are always exceptions to these rules. For example, written CF on a

sentence such as “Sam is in the car”- “Mary is in the house”, may not help the student to produce accurate sentences such as “Tom is on the bus” or “Nadine’s family is at home” in a subsequent new task. Although the students were required to use the same prepositions of space (“in”, “on” and “at”) in all of the tasks, the feedback on their pre-test might not always have helped them to produce accurate sentences in a subsequent new task (immediate post-test).

Moreover, written CF on prepositions can be confusing at times. For example, feedback on the same task such as “Mary is in the kitchen” and “Roy is at dentist” might not explain why two different prepositions are used to describe someone in an enclosed space. The use of prepositions indicating space also depends on the specific linguistic context. Sentences such as “Noora is in school” and “Noora is at school” express different meanings (Guo, 2015). Factors related to differences in task difficulty and the possibility of encountering different or similar uses/contexts of the same preposition in different tasks might also affect the students’ performance on each test.

5.2.2.3 Long-term learning effect (new task-delayed post-test)

Looking at accuracy over time regarding the prepositions, Figure 5.2 (above) shows that the three groups increased their accuracy in the delayed post-test. This result was unexpected, since there was a decline in the immediate post-test but a statistically significant improvement in the delayed post-test ($p = .000$). Since neither treatment group outperformed the control group on the delayed post-test, however, the long-term effectiveness of written CF for prepositions cannot be claimed.

An explanation for the increased accuracy of the treatment groups with regard to prepositions could be that a hypothesis made in one instance might not be helpful in one subsequent writing task but might be helpful in another. This would depend on whether a certain preposition occurred in the same context or in a different context in the subsequent writing task. For example, written CF on a sentence in the pre-test such as “Sam is in the car” might not help the students to produce a sentence in the immediate post-test such as “The children are on the bus.”, but would help them to produce a sentence in the delayed post-test such as “Mark is in the helicopter”. Another example is that written CF on the pre-test. “Noora is in the classroom” may not help students to produce a sentence in the immediate post-test such as “Mike is at the dentist” but might helpful them to produce a sentence in the delayed post-test such as “Mary is in the kitchen” or “Emily and Sam are in the room”.

However, since the control group increased their accuracy as well as the treatment groups, another possible explanation could be that the students obtained extra input on prepositions from their teacher during the interval between the immediate post-test and the delayed post-test. This is one of the internal validity threats that has been frequently discussed in the literature. This includes the events that occur during the course of the treatment that are not part of the treatment itself (Hudson and Liosa, 2015, p.82). Bitchener (2008, p.114) points out that, in any longitudinal study, it is impossible to control for the effect of intervening variables, such as additional exposure to the targeted linguistic structures. In the case of this study, the participants could seek, be exposed to or receive extra input on the targeted linguistic structures either inside or outside the classroom. I contacted the class English teacher to enquire about this. The teacher said that she had not given the students any formal input on prepositions, based on our prior agreement before conducting the study. She explained that the students might have benefitted from incidental exposure to prepositions (in, on and at) in their everyday English classes, and also received incidental exposure to prepositions through their text books (reading texts). Through examining the students' text books, I found instances where prepositions of space (in, on and at) were used in different tasks. Appendix O presents samples of these instances.

5.3 Findings regarding research question 1

Does written CF help Omani EFL students to improve their grammatical accuracy with regard to newly-learned linguistic structures during revision and in new writing over time?

From the above analysis, the findings regarding this question can be summarized as follows. Written CF helped the Omani EFL students to improve their grammatical accuracy during revision. There was a short-term effect of written CF on the comparative but not on prepositions of space. There was no long-term effect for written CF on either linguistic structure.

5.4 Findings regarding research sub-question 1a

Does the effectiveness of written CF vary according to the targeted linguistic structure (the comparative versus prepositions of space)?

Figures 5.1 and 5.2 (above) show that the grammatical accuracy of the students improved during revision for both linguistic structures (the comparative and prepositions of space). However, the revision task was performed under controlled conditions as the students

received feedback and revised the same task. Therefore, it was important to explore whether there were any differences between the students' performance regarding the two linguistic structures when performing a new task (immediate post-test) related to the same linguistic structures (the comparative and prepositions of space). It was found that the results for the comparative differed from those for prepositions in the immediate post-test. For the comparative, there was a retention of accuracy for direct CF and a slight increase in accuracy for indirect CF in the immediate post-test. This result indicates that the learning process had begun due to the written CF provided (some degree of short-term effect). For prepositions, there was no evidence that the learning process had begun, as the students' performance with both types of written CF declined in the immediate post-test.

The results of the current study suggest, therefore, that written CF (both direct and indirect) was more effective regarding rule-governed errors (the comparative) than for less-rule governed errors (prepositions) in the short-term. This result was similar to other studies (e.g. Bitchener et al. 2005), which found that written CF was more effective for rule-governed errors (simple past tense and English articles) than for less-rule governed errors (prepositions) as, with rule-governed structures, learners could refer to rules to resolve their errors.

5.5 Findings regarding research sub-question 1b

Does the effectiveness of written CF vary according to the type of feedback (direct versus indirect)?

In the written CF literature, there has been a debate about the effectiveness of the different types of written CF. Some researchers argue that indirect written CF is more effective than direct written CF (Lalande, 1982) because it may engage learners in hypothesis testing, deep processing and problem-solving, once an error has been identified. Others argue that indirect written CF is unlikely to be effective because it might not provide the learners with sufficient information to resolve idiosyncratic and complex linguistic errors (e.g. prepositions and syntactic errors) (Van Beuningen et al., 2012, p.7). Following this argument, learners would be expected to benefit more from explicit types of written CF than from implicit ones, as learners may better attend to and notice more salient types of input (Bitchener and Storch, 2016).

In this study, direct written CF can be regarded as more explicit than indirect written CF because, with the former, the error was highlighted and the correct form provided while, with the latter, the error was only highlighted without any provision of the correct form.

A. Effectiveness during revision

The results of this study show that both types of written CF (direct and indirect) followed a similar pattern with regard to the revision of both linguistic structures. The accuracy of the students increased during revision, which means that both types of written CF were effective for the comparative and prepositions. Comparing each type of written CF to the control group, the direct CF group significantly improved their accuracy during revision with regard to both linguistic structures. This may be expected as, with direct written CF, the students were provided with corrections and so some students may simply memorize and copy them into their revisions.

B. Effectiveness on new task (immediate-post-test)

With regard to a short-term learning effect, the indirect CF group performed better, as they improved their accuracy on the immediate post-test with regard to the comparative, while the direct CF group retained the same level of accuracy during their revision.

With regard to prepositions, both direct and indirect CF's groups declined performance on the immediate post-test: the direct CF group's accuracy level declined to the same level as in their pre-test, and that of the indirect CF group further declined to a level below their pre-test. Comparing the direct and indirect CF groups' performance in prepositions, students benefited less from the latter than from the former in their immediate post-test.

With regard to the short-term learning effect (immediate post-test), the students benefited from indirect CF on rule-governed structures (the comparative). For less-rule governed structures (prepositions), the indirect CF was less effective, as the students' performance declined to a level below their performance on the pre-test. This result might go with what Ferris (1999) suggests that indirect CF is better to be used with rule-governed errors that follow strong rules.

C. Effectiveness on new task (delayed post-test)

Although both the direct and indirect CF groups' accuracy declined on the delayed post-test with regard to the comparative, that of the direct CF group declined more steeply. This might indicate that the students who received indirect CF processed it in more depth than did those

students who received direct CF. As mentioned earlier, the students who received direct CF might depend more on memorization, which decayed over time.

5.6 Findings regarding research sub-question 1c

Does the effectiveness of indirect written CF vary according to the proficiency level of the students (higher versus lower level)?

This question examines the potential influence of the proficiency level of the students on the efficiency of written CF. The question has educational implications, as it would be valuable for teachers and written CF practitioners to know whether students with different proficiency levels are equally able to benefit from indirect written CF. Moreover, the answer to this question has theoretical implications. It has been suggested in the written CF literature that the proficiency level of the learners is indicative of their linguistic competence and that learners with lower levels of linguistic competence might be less able to correct their errors based on indirect written CF (e.g. Hyland and Hyland, 2006; Ferris, 2004).

This study was conducted in an L2 learning setting which involves focusing on the grammatical rules, so the students gained an explicit awareness of the different linguistic structures and the terms used to describe them. Individual learners differ with regard to their metalinguistic competence, which may lead to the expectation that students of a higher proficiency level might benefit more from indirect written CF (underlining) than students of a lower proficiency level because, in the indirect written CF, the errors were only underlined and the students need to refer back to their existing metalinguistic knowledge in order to resolve them.

To answer research question 1c, the proficiency levels of the students was added as another (between-subjects) factor. To analyze the proficiency levels of the students, comparisons were made between the higher and lower proficiency level groups for each linguistic structure to see if the proficiency level of the students had any moderating role on the effectiveness of indirect written CF.

5.6.1 The effect of proficiency level on the use of indirect written CF regarding the comparative

Table 5.8 (below) shows the descriptive statistics for accuracy by proficiency level, treatment type and tests regarding the use of the comparative.

Proficiency level	Group	N	Pre-test		Revision		Declined-improved	Immediate post-test		Declined-improved	Delayed post-test		Declined-improved
			M	SD	M	SD		M	SD		M	SD	
Higher	Direct written CF	10	82.00	21.49	87.00	25.40	5+	85.00	25.49	3+	52.00	37.35	30-
	Indirect written CF	10	48.00	46.61	62.00	38.23	14+	64.00	43.76	16+	44.00	42.73	4-
	Control	9	50.00	41.53	64.44	42.75	14.44+	60.00	40.92	10+	43.33	44.15	6.67-
Lower	Direct written CF	11	55.45	39.84	64.54	36.43	9.09+	67.27	33.49	11.82+	32.72	34.66	22.73-
	Indirect written CF	10	42.00	41.04	48.00	46.61	6+	49.00	51.73	7+	30.00	32.99	12-
	Control	8	28.75	45.17	36.25	50.12	7.5+	36.25	47.79	7.5+	25.00	29.27	3.75-

Table 5.8: Mean scores and standard deviations by group, testing time and proficiency level (the comparative)

It can be seen in Table 5.8 (above) that the students with a higher proficiency level used the comparatives with higher accuracy throughout all tests.

The one way ANOVA post hoc comparisons results show that the difference between the higher and lower groups was close to significance both during the revision (p= .061) and in the delayed post-test (p = .080). The analysis might have yielded a significant p value if the sample had been larger.

In order to establish whether or not the proficiency level of the students had an influence on the degree to which they were able to benefit from the indirect written CF, their scores for improvement and decline in accuracy were added (the difference between the mean scores in the pre-test and revision; the immediate post-test and the pre-test; the delayed post-test and the pre-test). In Table 5.5 (above), the sign "+" means that the accuracy improved while the sign "-" means that it declined.

The results show that students with both higher and lower proficiency levels improved their degree of accuracy both during revision and in the immediate post-test. The higher proficiency level group benefited from direct written CF as their performance improved by five during the revision and three on the immediate post-test. The improvement of the higher group which received indirect written CF was greater as the students improved by 14 during revision and by 16 on the immediate post-test.

The lower level group, on the other hand, benefited more from the direct CF during the revision (9.09+) and (11.82+) on the immediate post-test. The lower level group benefited less from the indirect CF during revision (6+) and (7+) on the immediate post-test.

For the comparative, the results suggest that the proficiency level of the students had an influence on the degree to which they were able to benefit from the indirect written CF in the short-term. The higher proficiency level group benefited more from the indirect written CF (16+) than the lower proficiency level group (7+) in the short-term (new writing-immediate post-test).

In the long-term, the accuracy of both the higher and lower proficiency level groups who received indirect written feedback declined. However, the decline among the lower proficiency level group (12-) was greater than that among the higher proficiency level group (4-). These results concord with the theoretical claim that learners with a low level of metalinguistic competence might be less able to correct their errors using indirect written CF.

5.6.2 The effect of the proficiency level on the use of indirect written CF regarding prepositions of space

Table 5.9 (below) presents the descriptive statistics for accuracy by proficiency level, treatment type and tests regarding the use of prepositions of space.

Proficiency level	Group	N	Pre-test		Revision		Declined-improved	Immediate post-test		Declined-improved	Delayed post-test		Declined-improved
			M	SD	M	SD		M	SD		M	SD	
Higher	Direct written CF	10	51.00	14.49	60.00	26.24	9+	51.00	5.67	0	62.00	22.50	11+
	Indirect written CF	10	50.00	14.90	50.00	25.81	0	42.00	10.32	8-	64.00	9.66	14+
	Control	9	52.22	12.01	45.55	16.66	6.67+	55.55	16.66	3.33+	70.00	17.32	17.78+
Lower	Direct written CF	11	52.72	9.04	67.27	18.48	14.55+	52.72	11.03	0	50.00	16.12	2.72-
	Indirect written CF	10	45.00	23.68	58.00	19.32	13+	49.00	15.95	4+	60.00	20.00	15+
	Control	8	50.00	13.09	43.75	9.16	6.25-	47.50	10.35	2.5-	70.00	16.90	20+

Table 5.9: Mean scores and standard deviations by group, testing time and proficiency level (prepositions of space)

For the prepositions, the one way ANOVA post hoc comparisons show that there was no significant difference between the higher and lower groups during revision ($p = .328$), on the immediate post-test ($p = .835$) and on the delayed post-test ($p = .195$).

The results show that there was no influence of proficiency level on the effectiveness of indirect written CF regarding prepositions. The higher level students who received indirect CF did not improve during their revision (0), and their mean scores declined by eight on the immediate post-test. They improved their accuracy by 14 on the delayed post-test. The lower level students who received indirect CF improved their accuracy by 13 during their revision, by four on the immediate post-test and by 15 on the delayed post-test.

The prepositions of space results are interesting. They show that the proficiency level of the students did not play any moderating role regarding the efficiency of the indirect CF, as the higher level students did not gain more benefit from the indirect written CF than the lower level ones. One possible explanation for that is that prepositions of space are 'less rule-governed', so trying to apply rules to prepositions may cause errors. The higher level students who received indirect written CF may be trying to apply the rules, as a result of which they were unable to resolve their errors during revision and committed more errors on the immediate post-test.

Summarizing the results for research question 1c, it was found that the low proficiency level students were less able to benefit from indirect written CF regarding the comparative but not the use of prepositions of space. Therefore, the influence of the proficiency level of students on the effectiveness of the indirect written CF was found only for a rule-governed structure (the comparative) but not less-rule governed structure (prepositions of space).

To conclude, this chapter presented the results of the quasi-experiment. The results for research question 1 show that both types of written CF helped the students to revise their tasks related to the comparative. However, an effect for written CF on the comparative cannot be claimed since the control group also improved. There was a short-term effect for both types of written CF regarding the comparative but no long-term effect for either type of written CF. The results for the prepositions of space show that both types of written CF outperformed the control group during revision. No short- or long-term effect was found for both types of written CF regarding prepositions of space.

Regarding the factors that may moderate the effectiveness of written CF, the results for research question 1a show that the type of errors impacted on the effectiveness of written CF. It was found that both types of written CF (direct and indirect) had a short-term effect regarding the comparative but not prepositions of space. For research question 1b, the type of written CF was not found significantly to impact on the effectiveness of written CF related to both linguistic structures. Although the results for the comparative show that the group which received indirect CF performed better than the one which received direct CF on the immediate post-test, no significant effect was found between the two types of written CF (direct and indirect). The results for research question 1c show that the proficiency level of the students impacted on the effectiveness of indirect written CF, as it was found that students with a higher proficiency level benefited more from indirect written CF than those from a lower proficiency level in comparatives. The next chapter presents the analysis and findings related to the TAPs.

CHAPTER SIX

TAP Analysis & Findings

6.1 Introduction

In order to answer research question 2, regarding how the students repair their errors in response to direct and indirect written CF in their subsequent revision, an analysis of the students' uptake in their subsequent revision was conducted using TAP data. In this study, I used an uptake analysis scheme adapted from Lyster and Ranta (1997). I developed the scheme by adding two further criteria: "repair with understanding" and "repair without understanding", in establish whether the students understood the written CF that they had received and could implement it when they revised their tasks. Before presenting the TAP analysis, Lyster and Ranta's (1997) uptake analysis model is first presented. The uptake analysis scheme of coding used in the current study is consequently explained. Finally, an analysis of the TAP data is presented to provide answers to research question 2 and 3.

6.2 Lyster and Ranta's (1997) uptake analysis model

In Lyster and Ranta's (1997) study, uptake refers to what the student attempts to do with the teacher's feedback, as explained in the methodology chapter. Lyster and Ranta (1997) examined the uptake of learners' oral error correction in communicative classes. Nevertheless, the concepts of uptake and repair also apply to written CF (Sheen, 2011). Repair occurs when L2 students successfully repair their writing based on written CF and incorporate the corrections into their revised texts (Sheen, 2011, p.8). Some students may fail to repair their writing based on written CF and end up repeating similar errors or producing different ones (Sheen, 2011, p.8). Both oral interaction and writing share similar basic components: the students make errors, and then receive either oral or written CF on these. The students' response to the errors is based on their teachers' oral or written feedback.

Lyster and Ranta (1997, p. 49) identified two types of uptake: (a) uptake that results in the "repair" of the error on which the feedback focused and (b) uptake that results in an utterance that still needs-repair. Repair, in Lyster and Ranta's (1997, p. 49) model, refers to "the correct

reformulation of an error as uttered in a single student turn and not to the sequence of turns resulting in the correct reformulation; nor does it refer to self-initiated repair" (Lyster and Ranta, 1997, p.49). The "needs-repair" category is "one that can lead to additional feedback from the teacher and thus allows for error treatment sequences to go beyond the third turn" (Lyster and Ranta, 1997, p. 50).

6.3 The scheme for coding the students' uptake in their subsequent revisions in the current study

Uptake in this study is defined as the students' written response to the teachers' written feedback that constitutes a written reaction in some way to the teacher's intention to draw attention to some aspect of the student's initial response.

In this study, the two types of uptake from Lyster and Ranta (1997) are included in the analysis: 'repair' and 'needs-repair'. 'Repair' is defined as a correct response to an error in a subsequent revision while 'Needs-repair' refers to an inaccurate response to an error in a subsequent revision that needs additional written feedback. Since this study aims to investigate the type of repair made by the students, the 'repair' category is further subcategorized into:

1. ***Repair with understanding****:* a correct response to an error in a subsequent revision, with explicitly having the ability to provide an accurate relevant grammatical rule. The understanding evidence is taken from the introspective TAP data. It is identified by the students' providing the accurate grammatical rule related to the targeted linguistic structure when producing verbal reports (introspective/concurrent meta-linguistic TAP). Example 1 provides an illustration of 'repair with understanding'.

Example 1

Pre-test

"Mike is more old than Sam".

(Incorrect sentence-student received indirect CF, underlining error)

Revision

"Mike is older than Sam", I added 'er_than' here because the word old is one syllable.

In this example, the student produced an incorrect sentence in her pre-test ("Mike is more old than Sam)", then received indirect written CF (underlining error). She produced a correct

sentence in her subsequent revision and provided an accurate verbalization of the grammatical rule (“I added 'er_than' here because the word old is one syllable”).

2. ***Repair without understanding:*** a correct response to an error in a subsequent revision with an inaccurate provision of the grammatical rule. Evidence of “repair without understanding” is taken from the introspective TAP data as well, and is identified by the students' inaccurate provision of the grammatical rule of the targeted linguistic structure when the student was producing a verbal report (Introspective/concurrent meta-linguistic TAP).

Example 2

Pre-test

more expensive

“A car is ʌ expensiver than a bicycle”.

(Incorrect sentence/student received direct CF, correction is provided above the wrong structure)

Revision

“A car is more expensive than a bicycle”, I added 'more_than' because the word expensive is one syllable.

Example two provides evidence of a “repair without understanding”. The student produced an incorrect sentence during her pre-test (“A car is expensiver than a bicycle”). She received direct written CF (underlining and direct correction), and produced a correct sentence in her revision but with an inaccurate justification of the grammatical rule (“I added 'more_than' because the word expensive is one syllable”).

As explained in the methodology chapter, in this study, two types of TAPs were used: introspective TAP and retrospective TAP. For the introspective TAP, the students were required to produce concurrent verbal reports and provide a justification for the sentences they produced. The retrospective TAP was conducted immediately after each student finished the introspective TAP, where I further scaffolded them and asked them about the grammatical rules they had applied during the task.

Although all of the students were instructed (in both the written text and orally) to provide justifications for the sentences they produced during their revisions (concurrent meta-linguistic TAP), there were some scripts where the students failed to provide a justification of

the repair for some sentences. The retrospective TAP data were used further to identify the type of repair that the students made.

Although I reminded the students to provide justifications while doing the TAP from time to time, some students, whether intentionally or unintentionally, failed to do so. By comparing the different proficiency level of the students' TAP scripts, I found that the majority of those containing such cases belonged to students with an average or low level of proficiency, which might indicate that they intentionally avoided justifying their repair because they found this difficult. The retrospective TAP data show that these students struggled to understand the grammatical rule related to the specific linguistic structure.

Needs-repair was used to code the errors that the students committed during their subsequent revision. The category of 'needs-repair' includes the following three types:

1. ***Same error*** refers to a repetition of the student's initial error. (Lyster and Ranta, 1997, p. 50).

Example 3

Pre-test

"The children are <u>in</u> the bus."

Revision

"The children are <u>in</u> the bus."

2. ***Different error*** refers to a student's uptake that is in response to the teacher's feedback but that neither corrects nor repeats the initial error; instead, a different error is made (Lyster and Ranta, 1997, p. 50).

Example 4

Pre-test

"Muscat is <u>wonderfuler</u> than Ibri."

Revision

"Muscat is more wonderfuler than Ibri."

3. ***New error emerged*** refers to uptake that includes totally new errors. Correct responses in the initial pre-test became incorrect in the subsequent revision.

Example 5

Pre-test

‘Peter is stronger than Steven’ √

Revision

“Peter is more stronger than Steven” ×

The category of “new error emerged” was added to the coding scheme of this study because the students' performance in the subsequent revision yielded some data that showed errors of this type.

6.4 Analysis and findings related to research question two

How do the students repair their errors in response to direct and indirect written CF in their subsequent revision?

In order to answer research question 2, three methods were adopted: a) content analysis of the students’ first and revised tasks to examine the students’ use of written CF (repair and needs-repair); b) introspective metalinguistic TAP to examine the students’ understanding of written CF; and c) retrospective TAP to examine the students’ understanding of written CF in cases where some students did not provide justifications in their introspective metalinguistic TAP data.

I produced a scheme of coding to analyse the students’ uptake during revision. This scheme included the elements which have been explained earlier: repair (repair with understanding, repair without understanding) and needs-repair (same error, different error and new error emerged). An analysis was carried out to examine the amount and type of uptake that each student engaged in during her subsequent revision. The coding and analysis of the errors, repair and needs-repair were conducted for each student in the three groups.

Table 6.1 (below) presents an example of the uptake analysis of a low proficiency level student (S24) using the scheme of coding for the students’ uptake during revision. The analysis shows the number of preposition errors she committed during the pre-test and the amount and type of repair and needs-repair she made in her subsequent revision.

Linguistic structure	Treatment	Student ID	Sentence No.	Errors in pre-test	Students' uptake in revision						
					Repair			Needs-repair			
					Total repair	Repair with understanding	Repair without understanding	repair-Needs	Same error	Different error	New Error emerged
Prepositions	Direct written CF	S24	1	×				×	×		
			2	×				×		×	
			3	√							
			4	×	√	√					
			5	√				×			×
			6	×	√		√				
			7	√							
			8	×	√		√				
			9	×				×		×	
			10	√				×			×
			Total	**6**	**3**	**1**	**2**	**5**	**1**	**2**	**2**

Table 6.1: Scheme of coding students' uptake in subsequent revision

Table 6.1 (above) shows that student S24 committed six preposition errors in her pre-test. She was able to repair three of these errors in her revision, one with understanding and two without understanding. The student committed five errors in the (needs-repair) category: one same error, two different errors, and two new errors emerged in her revision.

Data from the uptake analysis of each individual student (see Table 6.1) were used to produce a summary table of all of the students' uptake in revision, presented in Table 6.2 (below). The table presents the uptake of the three groups (direct, indirect and control) for each linguistic structure (the comparative and prepositions of space).

Treatment	The Comparative									
			Uptake							
			Repair				Needs-repair			
	No. of students	Proficiency level	No. of errors in pre-test	Total repair in revision	Repair with understanding	Repair without understanding	Total of needs-repair	Same error	Different error	New error emerged
Direct	1	High	0	-	-	-	0	-	-	-
	2	High	2	2	0	2	0	-	-	-
	3	Medium	5	0	0	0	10	3	2	5
	4	Medium	0	-	-	-	0	-	-	-
	5	Low	10	0	0	0	10	9	1	0
	6	Low	10	0	0	0	10	10	-	-
Indirect	7	High	1	1	1	0	0	-	-	-
	8	High	0	-	-	-	0	-	-	-
	9	Medium	6	5	5	0	1	0	1	0
	10	Medium	0	-	-	-	0	-	-	-
	11	Low	10	0	0	0	10	10	-	-
	12	Low	10	0	0	0	10	0	10	0
Control	13	High	0	-	-	-	0	-	-	-
	14	High	0	-	-	-	0	-	-	-
	15	Medium	2	2	2	0	0	-	-	-
	16	Medium	0	-	-	-	0	-	-	-
	17	Low	10	5	0	5	5	1	4	0
	18	Low	10	0	0	0	10	9	1	0
Prepositions										
Direct	19	High	6	6	5	1	1	0	0	1
	20	High	4	4	3	1	0	-	-	-
	21	Medium	5	2	2	0	3	2	1	0
	22	Medium	5	2	2	0	4	3	0	1
	23	Low	2	1	0	1	5	1	2	2
	24	Low	6	3	1	2	5	1	2	2
Indirect	25	High	8	6	4	2	2	0	2	0
	26	High	4	2	1	1	2	0	2	0
	27	Medium	4	1	0	1	4	3	0	1
	28	Medium	7	1	0	1	8	3	3	2
	29	Low	7	4	4	0	6	3	0	3
	30	Low	6	2	1	1	7	0	4	3
Control	31	High	5	0	0	0	6	3	2	1
	32	High	4	1	1	0	5	2	1	2
	33	Medium	5	0	0	0	6	4	1	1
	34	Medium	7	0	0	0	8	3	4	1
	35	Low	3	0	0	0	4	3	0	1
	36	Low	5	1	1	0	6	3	1	2

Table 6.2: Summary of the students' uptake during their revision

Table 6.2 shows that all of the students, whatever their proficiency level, committed preposition errors, but that the majority of the errors related to the comparative were made by low and medium proficiency level students. This may be due to the fact that the use of the comparative is rule-governed, so the higher and medium level proficiency students found it easy to apply the grammatical rules when they performed the pre-test. Prepositions of space, on the other hand, are less rule-governed, so it can be challenging to refer back to the rules, because the rules have exceptions and the use of certain prepositions of space depend on the context, so the students need to have acquired a knowledge of preposition use in order to use them accurately. It appears that the majority of the student involved in this study have not yet reached that stage.

Data from table 6.2 (above) were used to establish how the students repair their errors in response to direct and indirect written CF. Due to the small size of the TAP sample (six students from each group) and the small number of errors committed by those students, a statistical analysis would not have been valid, so a descriptive analysis was conducted for the uptake analysis. The analysis was applied to the separate linguistic structures and both combined.

6.4.1 The Comparative

Table 6.3 (below) shows the comparative errors committed in the pre-test by the TAP students from the three groups (direct, indirect, control) and the amount and type of uptake they engaged in during their revision.

The Comparative																	
Treatment	No. of students	Errors in pre-test		Uptake in revision													
				Repair						Needs-repair							
				Total repair		Repair with understanding		Repair without understanding		Total needs repair		Same error		Different		New error emerged	
		No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Direct CF	6	27	45%	2	7%	0	0%	2	100%	30	50%	22	73%	3	10%	5	17%
Indirect CF	6	27	45%	6	22%	6	100 %	0	0%	21	35%	10	48%	11	52%	0	0%
Control (No CF)	6	22	37%	7	32%	2	29%	5	71%	15	25%	10	67%	5	33%	0	0%

Table 6.3: Comparative errors made by the three groups and the amount and type of uptake that the students engaged in during their revision

Table 6.3 (above) includes the numbers and percentages related to the different types of uptake. Appendix P presents how the percentages in the analysis are calculated.

Table 6.3 shows that the indirect and control groups engaged in a higher number of total repairs than the direct group: direct CF 7% (n=2), indirect CF 22% (n=6) and control 32% (n=7). Comparing the direct and indirect CF groups, the latter repaired (22% n=6) whereas the former repaired only 7% (n=2) of their errors in their subsequent revision.

Looking at the type of repair generated by the different treatments (direct CF, indirect CF and control/no feedback), the control group was able to repair with understanding 29% (n=2) of their errors and 71% (n=5) without understanding.

Comparing the direct CF and the indirect CF groups, 100% (n=6) of the errors of the indirect CF group were repaired 'with understanding', whereas the direct CF group repaired 100% (n=2) of their errors ‘without understanding’.

For a closer analysis of the number of errors that the students committed during their revision (needs-repair), the data in Table 6.3 (above) shows that the direct CF group committed the highest number of errors (50%; n=30), while the number of errors for the indirect CF group, was lower, dropping from 45% (n=27) in the pre-test to 35% (n=21) in the revision. The control group also improved, as their number of errors dropped from 37% (n=22) in the pre-test to 25% (n=15) in the revision. These results suggest that the indirect CF group benefited more from the feedback compared with the direct CF group.

Looking closely at the “needs-repair” section, the control group made 67% (n=10) same errors and 33% (n=5) different errors in their revision. Since the control group received no feedback on the pre-test, most of their ‘needs-repair’ were linked to the same error, so their lack of written CF affected their performance in their subsequent revision.

Comparing the direct CF and the indirect CF groups, the former made more same errors (73%; n=22) than the indirect CF group (48%; n=10). This result was unexpected because the direct CF group received direct written correction above their errors.

6.4.2 Prepositions of space

Table 6.4 (below) shows the preposition errors committed in the pre-test by the three groups (direct, indirect, control) and the amount and type of repair they engaged in during their revision.

Prepositions																	
Treatment	**No. of students**	**Errors in pre-test**		**Repair made during revision**													
				Repair						**Needs-repair**							
				Total repair		**Repair with understanding**		**Repair without understanding**		**Total needs repair**		**Same error**		**Different error**		**New error emerged**	
		N.	%	N.	%	N	%	N.	%	N.	%	N.	%	N.	%	N.	%
Direct CF	6	28	47%	18	64%	13	72%	5	38%	16	27%	7	44%	3	19%	6	37%
Indirect CF	6	36	60%	16	44%	10	62.5%	6	37.5%	29	48%	9	31%	11	38%	9	31%
Control (No CF)	6	29	48%	2	7%	2	100%	0	0%	35	58%	18	51%	9	26%	8	23%

Table 6.4: Preposition errors made by the three groups and the amount and type of repair that the students engaged in during the revision

For prepositions, the direct CF and the indirect CF groups achieved a higher percentage of total repair than the control group; 64% (n=18) for the direct CF group, 44% (n=16) for the indirect CF group, only 7% (n=2) for the control group. For the type of repair, the control group repaired all of the errors with understanding, 100% (n=2). The direct CF group was able to repair with understanding 72% (n=13) of the errors and the indirect CF group was able to repair with understanding 62.5% (n=10)

For the needs-repair, the control and the indirect CF group got the highest percentage of total 'needs-repair' in the revision for prepositions; direct CF 27% (n=16), indirect CF 48% (n=29), control 58% (n=35). For the direct CF group the majority of 'needs-repair' errors is divided between same error 44% (n=7) and new error emerged 37% (n=6). For the indirect CF group, most of the 'needs-repair' errors fall under different error 38% (n=11). The rest of the indirect CF group errors spread equally between same error 31% (n=9) and new error emerged 31% (n=9). Most of the control group's 'needs-repair' errors are under same error 51% (n=18) which was unsurprising since this group did not receive written CF.

6.4.3 Combined linguistic structures (the comparative and prepositions of space)

Due to the small sample size and since the uptake analysis focuses on the amount and type of uptake engaged in by the treatment groups (direct CF and indirect CF), the uptake data on both linguistic structures (the comparative and prepositions) are merged in the following table (Table 6.5). The analysis of the uptake will focus on data related to when these two linguistic structures are combined.

The Comparative & Prepositions																	
Treatment	**No. of students**	**Errors in pre-test**		**Uptake in revision**													
				Repair						**Needs-repair**							
				Total repair		**Repair with understanding**		**Repair without understanding**		**Total needs repair**		**Same error**		**Different error**		**New error emerged**	
Direct CF	12	55	46%	20	36%	13	65%	7	35%	46	38%	29	63%	6	13%	11	24%
Indirect CF	12	63	53%	22	35%	16	73%	6	27%	50	42%	19	38%	22	44%	9	18%
Control (No CF)	12	51	43%	9	18%	4	44%	5	56%	50	42%	28	56%	14	28%	8	16%

Table 6.5: Comparative and preposition errors made by the three groups and the amount and type of uptake engaged in during the revision

The first column of Table 6.5 shows the type of treatment. The second column shows the numbers and percentages of comparative and preposition errors committed by each group; for example, the direct group committed a total of (n=55) errors, that is 46% of the total. It was calculated as follows: 27 comparative errors + 28 preposition errors ÷ 120 sentences of obligatory use of these linguistic structures × 100 = 46%. After merging the data on the comparative and prepositions, the total number of students doubled, from six to twelve (12 students × 10 sentences = 120 sentences).

6.4.3.1 Analysis of the students' repairs

Table 6.5 (above) shows that both the direct and indirect groups achieved almost the same percentage of total repairs in the revision when both linguistic structures were combined: direct CF 36% (n=20) and indirect CF 35% (n=22). The control group achieved the lowest percentage for repair (18%; n=9). This result is unsurprising since the control group received no feedback on

their pre-test. Therefore, the lack of written CF on their pre-test may have negatively affected the amount of repair that the control group engaged in during the revision.

It is claimed, in the written CF research, that learners may notice and understand more explicit types of written CF because the feedback is more salient (Bitchener, 2017, p.133). Therefore, one might expect that the students would benefit more from the direct than the indirect written CF during their revision. This was because, with the direct written CF, the students received corrections above their errors while, with the indirect written CF, the students had their errors underlined only, without any corrections being provided. The results of the uptake in this study suggest that both types of written CF generated approximately the same amount of total repair.

In this study, although the indirect written CF is less explicit than direct written CF, it seems that the former was equally effective as the latter. The lack of explicit corrections may have pushed the students to engage in deeper processing of the written CF.

6.4.3.2 Analysis of the type of repair

Regarding the type of repair generated by the three groups when both linguistic structures were combined, both treatment groups generated more repair with understanding than did the control group; direct CF 65% (n=13); indirect CF 73% (n=16); control 44% (n=4). The direct and indirect CF groups generated approximately the same amount of repair with understanding: direct CF (n=13) and indirect CF (n=16).

The results for the uptake in this study suggest that both the direct and indirect written CF groups were able to generate repair with understanding during their revision. It was expected that the students who received direct written CF would be better able to repair their errors with understanding than the group which received indirect CF. This was because providing the corrections above the errors might help the students to notice the gaps (between their output/errors and the teachers' input/direct written CF), which might help them to repair their errors with understanding during their revision.

However, the results of the direct CF group show that 35% (n=7) of their repairs was without understanding. This may suggest that some of the students in the direct written CF group had merely memorized the corrections and copied them in their revision, so noticing that some input-

direct written CF had been provided on the students' writing might generate repair during revision but does not always guarantee repair with understanding. This may be applicable at all proficiency levels, as the data presented in Table 5.8 show.

The following example is extracted from a low proficiency level student's (S23) introspective TAP script when revising her initial task. Student S23 received direct written CF on her initial task (the pre-test). Although she repaired the sentence during her revision, this was without understanding. The direct written CF helped the student to produce an accurate sentence during her revision but did not help her to understand the feedback.

Revision

Sentence 6
S23: 'Nadines' family at home.', because it is a family.

The indirect written CF group generated 73% (n=16) of the repair with understanding. This result may be explained by the potential of indirect written CF to engage learners in problem-solving and hypothesis-testing, that promotes L2 learning (Lalande, 1982; Ferris & Roberts, 2001). The indirect written CF group may have processed the written CF in greater depth, trying to understand their errors and figure out both the corrections and the grammatical rules. The indirect CF group generated 27% (n=6) of the repair without understanding, which might indicate that some students were making guesses based on inaccurate hypotheses (grammatical rules).

However, it is important to note that most of the indirect group's repair with understanding was undertaken by the high and medium level proficiency students (about 11 instances), as shown in Table 6.2. This means that the low proficiency level group was less able to benefit from the indirect written CF and so repair their errors with understanding compared with the high proficiency level group, possibly due to the former's limited existing knowledge. This suggests that the proficiency level of the students may have an impact on whether they repair their errors in response to indirect written CF with understanding.

6.4.3.3 Analysis of needs-repair

In Table 6.5 (above), the 'needs-repair' category shows that the indirect written CF and control group had the same number of total of 'needs-repairs': the indirect CF 42% (n=50) and the control group 42% (n=50). The direct written CF group had 38% (n=46) of 'needs-repair'.

It is important to examine in detail the types of 'needs-repair' for each group. Table 6.5 (above) shows that the majority of the control group's 'needs-repair' was related to the same error 56% (n=28). This result is interesting and indicates that the control group was affected negatively by the lack of written CF. Because this group did not receive any kind of written CF on their pre-tests, they may have found it difficult to make changes and repair their errors. Therefore, they repeated the same errors during their revision. This finding provides further evidence for the role of written CF in supporting students to revise their writing.

The majority of the indirect group's 'needs-repair' falls under different errors (44%; n=22). Different errors might indicate that the students were in the process of learning/acquiring L2 knowledge, as they were engaged in hypothesis-testing. Different errors might mean that the students were creating a hypothesis (thinking about the problem and trying to find a solution). The following example is taken from student S9's pre-test and revision scripts, and illustrates how different errors in the revision might indicate thinking/hypothesizing on the part of the student who received the indirect CF.

Example 1:

Pre-test

S9: "Peter is <u>strong</u> Steven." (error/student received indirect CF in pre-test)

Revision

S9: "Peter is <u>more strong than</u> Steven". (different error)

In both tasks, student S9 got sentence 8 incorrect. In task 1, the student did not use any comparative form. In task 2, she added "more_than", which indicates that she had recognized that something was wrong and that she needed to do something about it. Drawing on Gass's (1997) model of processing of input, hypothesis-testing is an important stage in the processing of L2 knowledge. According to Ferris (2002), hypothesizing induces deeper internal processing and promotes the internalization of the correct forms and linguistic structures.

The above example suggests that hypothesizing is part of the process of learning/acquiring L2 knowledge. The benefit of hypothesizing when processing the indirect CF might not be obvious until more than one episode of error correction (indirect CF) is provided to the learner regarding the same linguistic structure. For example, if student S9 received indirect CF on her sentence 2 above again, she might try another solution and make a different error again, or might try adding "er_than" and get the correct sentence ("Peter is stronger than Steven"). However, indirect CF had 38% of same errors in their subsequent revisions, despite the fact that their errors were underlined, which provided an indication and location of errors.

Table 6.5 (above) shows that the majority of the direct written CF group's needs-repair falls under same error. This is a surprising result, as the direct written CF group received corrections above their errors. The direct written CF group also produced a high percentage of new errors.

For research question 2, the findings from the students' uptake analysis when both linguistic structures are combined may be summarized as follows:

- Both the direct and indirect written CF groups generated a similar amount of repair during their revision.
- Both types of written CF (direct and indirect) generated almost a similar amount of repair with understanding during the revision. The direct written CF, as the more 'salient' type of written CF, did not generate more repair with understanding than the implicit indirect written CF, as I hypothesized. I expected that the direct CF would help the students to repair their errors with more understanding than the indirect CF because, in the former, the students' errors were underlined and corrections were provided while, in the latter, the students' errors were simply underlined. This result shows that indirect CF is equally effective as direct CF for revision. However, it could be argued that the indirect CF in this study was not very implicit since it was highly focused, whereby only one linguistic structure was targeted in each task.
- The results also suggest that the direct written CF (providing corrections above the errors) may generate repair during revision but does not always guarantee repair with understanding, as (35%) of the direct written CF group's repair was without understanding.
- The analysis also shows that the majority of the students who had repaired their errors with understanding in response to the indirect CF were high and medium proficiency level

students. This finding suggests that the proficiency level of the students might play a role in whether or not they understand the indirect CF.

- The uptake analysis also found that most of the control group's 'needs-repair' fell under the same error. This might indicate that the lack of written CF on their pre-test negatively affected their performance during their subsequent revision.
- The direct group had a high percentage of same error (63%; n=29), despite the fact that this group received corrections above their errors.

6.5 Analysis and findings related to research question three

Why was some written CF not incorporated by certain students into their subsequent revision?

As we have seen in the analysis and results, both treatment groups (direct CF and indirect CF) repeated the *same errors* in their subsequent revision; direct written CF 63% (n=29) and indirect written CF 38% (n=19). Qualitative data from the retrospective questioning provided some evidence regarding why some students repeated same errors in their revision. The analysis below provides answers for research question three: why was some written CF not incorporated by certain students into their subsequent revision?

6.5.1 Not noticing the gap

The following two examples were taken from students S5 and S6, who received direct CF on their first task (pre-test). The excerpt shows the students' replies when asked why they had repeated the same errors during their revision.

Example 1:

(S5- low level- direct CF)

88	R: Yes, was that useful? Look here. You wrote 'Mike is old Sam' in your first draft. The teacher corrected that and wrote "Mike is older than Sam. A lion is more dangerous than sheep". Why did you repeat the same errors during the revision?
89	S5: Maybe I need more time to go through the corrections.
90	R: Was the time insufficient to revise the task?
91	S5: It is confusing teacher.
92	R: What is confusing?
93	S5: The errors.
94	R: Aha, and what is about the grammatical rule? Did you use the grammatical rule when you completed the task?
95	S5: What do you mean?
96	R: We have grammatical rules in English, so when we talk and write we use those grammatical rules. In this task, we want to make a comparison between people and things, OK?
97	S5: Yes.

Example 2:

(S6- low level- direct CF)

116	R:	Did you see the corrections on your first task?
117	S6:	Yes.
118	R:	Did you benefit from the corrections?
119	S6:	Yes.
120	R:	You repeated the same errors in the revision. Why?
121	S6:	(silent) It's confusing.
122	R:	What's confusing?
123	S6:	Errors and corrections.
124	R:	I underlined the errors and wrote the correct words above the errors.
125	S6:	Yes, a lot of errors, I didn't understand, confusing.
126	R:	Do you prefer the teacher to underline the errors only for you?
127	S6:	No, I need to know the correct answers.

Both students S5 and S6 received direct CF but they repeated the same errors in their revision. When asked why, student S5 said "It is confusing, teacher" in turn 91, and student S6 said "It's confusing" in turn 121. It seems that both students failed to understand the direct written CF as, in turn 124, when I said "I underlined the errors and wrote the correct words above the errors", student S6 replied in turn 125 "Yes, a lot of errors, I didn't understand, confusing". An important point here is that students S5 and S6's comments (for example "Yes, a lot of errors, I didn't understand, confusing") suggest that they noticed the teacher's CF on their first task and so were aware that something was wrong with their sentences but, to their insufficient existing knowledge, felt confused and were unable to benefit from the written CF.

To gain a clear picture of the type of 'noticing' that S5 and S6 experienced while processing the written CF, it is important to return to Schmidt's (1995) 'noticing hypothesis', where he explains that learners need to notice or apperceive that some aspect of new linguistic information has been provided (Schmidt, 1995, p. 29). He further explains that, in the case of negative input/corrective feedback, the learner needs to notice that there exists a mismatch or gap between his/her output and the target language input that has been provided. He suggests that noticing with awareness and understanding (knowing the grammatical rules) are necessary for the effective processing of new L2 information (Schmidt, 1995, p. 29).

It seems that S5 and S6 have noticed, or 'apperceived', that new information, negative evidence (written CF), has been provided (for example, in turn 125, the student says, "Yes, a lot of errors, I didn't understand"), but were not 'noticing the gap-mismatch' between their output (errors) and

the teacher's input (direct CF) regarding their pre-test; otherwise, they would simply reform or copy the errors during their revision.

Example 3 is taken from the first part of the negotiated CF with low proficiency level student (S6). The student applied no comparative rules to any sentences during her revision, despite the direct written CF she had received regarding her pre-test. The turns show that student S6 did not benefit from the direct written CF she received on her pre-test, as she was unable to notice the mismatch in her erroneous sentence.

Example 3:

(S6 - low level proficiency- direct CF)

7	R:	Is there anything wrong in the sentence?
8	S6:	(silence)..."long"
9	R:	Yes, what's wrong with it?
10	S6:	(silence)
11	R:	What do you want to say here?
12	S6:	[The student provided an accurate comparative sentence but in Arabic]
13	R:	How would you say that in English?
14	S6:	"Mary's' hair is long is Suzan's hair?"
15	R:	No, we need to add something to the word "long".
16	S6:	(silence)
17	R:	Look at example 1. Read it.
18	S6:	This one?
19	R:	Yes.
20	S6:	"Sally is shorter than John."
21	R:	Look at the word "short". How is it written in the sentence?
22	S6:	"short".
23	R:	No, read it from the sentence.
24	S6:	"shorter".
25	R:	Yes, so what has been added?
26	S6:	"is?"

There is also another possible justification for why some students repeated their errors during the revision, which is related to the cognitive processing of information (learner internal cognitive factors). The working memory is a cognitive factor that might affect learners' processing of data (Bitchener and Storch, 2016, p. 26). The term 'working memory' refers to "a brain system that provides temporary storage and manipulation of the information necessary for such complex cognitive tasks as language comprehension, learning, and reasoning" (Baddeley, 1992, p.556).

Bitchener and Storch (2016) explain that the working memory is where new input is stored and integrated with information that is already encoded in the long-term memory and therefore where automatic and controlled cognitive processing occurs (e.g., attention, noticing, hypothesizing, restructuring, practice).

In his capacity-limited model, Skehan (1998) explains that the working memory is limited in capacity, requires conscious effort to control, and that such a limitation places a fundamental constraint on how the input is handled (Skehan, 1998, p. 44). He explains that learners with a large working memory capacity are better equipped to attend to and process input (Skehan, 1998, p. 44).

Bitchener and Storch (2016) suggest that lower proficiency level learners need to process new information in a more consciously controlled manner. More attention may need to be paid in their working memory to noticing gaps, encoding linguistic structures, and testing new hypotheses about correct usage (Bitchener and Knoch, 2016, p. 27). In the current study, comparing the low and high proficiency level students, the former might have a limited working memory capacity/span, which negatively affected their processing of the written CF during the revision. In example 2 (above), S5 stated "Maybe I need more time…" in (turn 89). This might indicate that the student was unable to process the written CF within the time allowed. Her comment about a lack of time might also indicate that she needed to process the written CF in a more consciously controlled manner.

6.5.2 Students rejecting and questioning the written CF

The TAP data also provided evidence that some students repeated their errors not because they had failed to notice the gaps/mismatch between their writing and the written CF but because they rejected the teacher's CF. The following examples (4 and 5) relate to students S23 and S22. They show how the students noticed the feedback provided by their researcher but intentionally rejected and questioned it.

Example 4:

(S23 - low level proficiency - indirect)

13	R:	And sentence 8?
14	S23:	"Peter in train".
15	R:	Is there anything wrong?
16	S23:	"in train" because Peter is inside the train.
17	R:	No, I corrected it on your first task.
18	S23:	Yes, but it is "in", teacher: "in car", "in taxi", so "in train", same.
19	R:	No, for a train, we say "on" not "in".
20	S23:	Why teacher?
21	R:	In English, it is like this, maybe in the past trains used to be uncovered so they used "on", so like a platform, uncovered.
22	S23:	Strange, in Arabic we say "in" for all: "car, taxi, train..."
23	R:	Yes, Arabic is different to English, we have different grammatical rules for different languages.

Example 5:

(S22-average level- direct CF)

23	R:	What about sentence 8?
24	S22:	"Peter in the train". I added "in" because Peter is inside the train.
25	R:	It is "on", "Peter is on the train", Why did you repeat the same error during your revision?
26	S22:	It is "in" teacher. See here, "Sam is in the car".
27	R:	Yes, we say "in" for a car, but "on" for a train.
28	S22:	Why teacher? Both are the same: "car, train".
29	R:	For a car, it is "in", yes, but for "a train", we need to use "on" in English. When someone is travelling by train, we say "on a train". OK?
30	S22:	Yes.

The above two examples (4 and 5) represent students with low and average proficiency levels. In these episodes, both students used "in" instead of "on" on their first task (pre-test) in sentence 8. Both students repeated the same error during their revision. When the researcher negotiated the CF with them, their replies indicated that they had noticed the teacher's feedback but had intentionally rejected it. For example, when the researcher said "No, I corrected it on your first task" (turn 17), S23 replied "Yes, but it is 'in', teacher: 'in car', 'in taxi', so 'in train', same" (turn 18). "Yes" indicates that the student had noticed the teachers' CF. Then, in turn 20, the student questioned the feedback by saying "Why, teacher?" Student S22 also rejected and questioned the teacher's CF (turns 23-29). Three students from the direct written CF group (S21, S22 and S23) repeated the same error in sentence 8 during their revision, as did a fourth student (S27) from the indirect written CF group.

In example six, student S22 also showed a rejection of the teacher's feedback. This time, the student insisted on using the preposition 'in' in sentence 6: "Nadine's family in the home" (turn 15). When the researcher negotiated the error with her, she said "Yes, we say in the house, so the same for home" (turn 17). Then she questioned the feedback "Why 'at' teacher?" (turn 19).

Example 6:

(S22- average level- direct CF)

14	R:	What about sentence 6?
15	S22:	"Nadine's family in the home".
16	R:	Is it "in"?
17	S22:	Yes, we say "in the house", so the same for "home".
18	R:	For "home", we do not say "in", we say "at". I corrected it on your first task and you repeated the same error.
19	S22:	Why "at" teacher?

20	R:	For home, we use “at” in English...”I am at home”.
21	S22:	Why not “in” teacher?
22	R:	In English it is like that…So if I call and ask you where are you right now, you will say “I am at home”. “Where is Nadine's family? Nadines' family is at home.OK?”

The above examples (4-6) show that, although the students noticed the teacher’s feedback, they deliberately chose to reject it. The data in the above examples suggest that the students rejected the teacher’s written CF and questioned it because it did not accord with their prior knowledge. For example, S23 stated (turn 18) “Yes, but it is 'in', teacher: 'in car', 'in taxi', so 'in train', same”. The student may already know “in a car, in a taxi” because she uses these phrases in the classroom (reading, writing, listening, speaking) and so has over-generalized the use of the preposition “in” for means of transportation (e.g. a train). When she received the researcher’s written CF, she rejected it because it did not accord with her 'prior knowledge' and she may have overgeneralized the use of “in” for means of transportation. The same applies to S22, who might have assumed that “in” accompanies “home” because of the effect of her 'prior knowledge' (‘in a house’), so she preferred to continue using the same preposition, “in home” during her revision rather than accept the teacher’s correction/written CF.

The fact that the students rejected some feedback intentionally was an interesting finding, which led me to consider alternative reasons for such a response. One possible explanation might be that some students did not trust my feedback because I was not their regular English teacher. Another explanation might be that some students thought that the researcher may have made a mistake in her corrections. Therefore, they decided to keep their own words based on what their logic told them. (S23 said “Yes, but it is 'in', teacher: 'in car', 'in taxi', so 'in train', same”.)

In this section, two main possible reasons were identified regarding why some of the students failed to incorporate the written CF during their revision. One was that some students noticed that some information has been added to their writing but failed to notice the gap/mismatch between their output and the researcher’s input (written CF). This might be due to their limited existing knowledge and low level of cognitive processing capacity. The second possible reason was that some students noticed the written CF but rejected it intentionally because it conflicted with their prior knowledge.

In summary, this chapter presented the TAP analysis and findings. The findings from the introspective TAP show that both the direct and indirect CF generated the same amount of repair

with understanding. Although direct CF is an explicit feedback strategy, some of the students found it challenging to repair their errors with understanding. This suggests that not all feedback which was noticed and repaired during the revision was understood. The findings from the introspective TAP also show that the majority of the students who repaired their errors with understanding in response to indirect CF were higher and medium proficiency level students. It was also found that the majority of the students who repeated exactly the same errors during their revision of the comparative were low proficiency level students. These findings suggest that the proficiency level of the students plays an important role in the degree to which they benefited from both the direct and indirect written CF.

The findings from the retrospective TAP shed light on some of the reasons why some of the written CF was not incorporated into the students' subsequent revision. In the next chapter, the findings of the quasi-experiment and TAP will be discussed, drawing on relevant SLA theories and the previous written CF research.

CHAPTER SEVEN

Discussion

7.1 Introduction

In this chapter, there will be a discussion of the findings of the quasi-experiment and TAP. This discussion of the findings draws on relevant SLA theories and the written CF research that were reviewed in Chapters 2 and 3. The findings are discussed according to each research question.

7.2 Findings regarding research question 1

Does written CF help Omani EFL students to improve their grammatical accuracy with regard to newly-learned linguistic structures during revision and in new writing over time?

Although written CF is one of the most widely-used practices in the L2 classroom, its efficiency has been debated by some researchers (Truscott, 1996). Truscott (1996) claims that written CF on learners' grammar errors is ineffective and potentially harmful. He argues that research has demonstrated no positive effect of written CF. His argument was also based on theoretical and practical issues, as explained in Chapter Three.

Since Truscott (1996) mounted a case against written CF, researchers have been keen to examine the various arguments made against it, particularly the claim that written CF is ineffective. Most recent research has found short- and long-term effects for written CF, but these studies examined the efficiency of written CF on already learned linguistic structures. The present study aimed to add to the existing research on written CF by examining its effectiveness on newly-learned linguistic structures. The findings related to research question 1 might shed light on the role of written CF in developing new L2 knowledge. To discuss the findings for research question 1, the revision, short-term and long-term effects of written CF are discussed separately.

7.2.1 Effectiveness of written CF during revision

Revision plays a central role in good writing in terms of content and form (Truscott and Hsu, 2008, p. 292). Early research (e.g. Ferris and Roberts, 2001; Ashwell, 2000, Fathman and Whalley, 1990) found that teachers' corrections helped learners significantly to improve their

accuracy during revision. For example, Fathman and Whalley (1990, p. 183) found that students significantly improved their grammatical accuracy during revision. Ferris and Roberts (2001, p. 171) found that the groups which received written CF (codes and underlining) outperformed the no-feedback group with regard to self-editing. More recent written CF studies (e.g. Van Beuningen, 2012; Van Beuningen, 2008) examined the relative effectiveness of direct and indirect written CF during revision. They found that both types of written CF were effective in improving learners' accuracy during revision.

In the current study, written CF was effective in improving the grammatical accuracy of Omani students during revision of both the comparative and prepositions of space. This finding extends the evidence for the effectiveness of written CF, as it suggests that it was effective during the revision of totally new linguistic structures.

One of the unexpected results of the quasi-experiment in this study was that the control group, which received no feedback, also improved their accuracy during revision of the comparative. Furthermore, there was no significant difference between the treatment groups and the control group with regard to revision. One possible explanation for the control group to improve their accuracy during revision despite their lack of written CF might be that the students benefited from critically examining their own text and revising it, even without receiving any written CF, as suggested by Van Beuningen (2012, p. 10).

7.2.2 Short-term learning effect of written CF (new writing-immediate post-test)

In the early research (e.g. Ferris and Roberts, 2001; Ashwell, 2000; Ferris, 1997; Fathman and Whalley 1990), learning was demonstrated through the accurate revision of an original text. However, Truscott (1996) points out that asking students to rewrite an original text does not constitute evidence of learning, as learners may simply copy the corrections in the case of direct CF. Truscott (2007) claims that accuracy gains during revision may only be a sign that learning or development has been initiated. To identify whether or not the learning process has begun, it is important to give learners an opportunity to write a new text. In this study, the students performed a new task (immediate post-test) three days after revising their initial task.

Van Beuningen et al. (2008, 2012) and Truscott and Hsu (2008) examined whether improved accuracy in revision was evident in the writing of new text. Truscott and Hsu (2008) found that improved accuracy in revision was not evident when the learners were asked to write a new text. They concluded that written CF is not useful as a learning tool but might have some

limited value as an 'editing tool'. However, the findings of Van Beuningen et al. (2008, 2012) contradicted what Truscott and Hsu (2008) found. Van Beuningen et al. (2008) reported that improved accuracy during revision was evident in new writing following direct written CF. Following this, Van Beuningen et al. (2012) found that both the direct and indirect written CF groups improved in terms of their accuracy in new writing one and four weeks later, respectively.

In the current study, four days after the students revised their tasks, they received an immediate post-test in which they performed a new writing task on the same linguistic structure. The results show that the improved accuracy during revision was evident in the new writing on the comparative but not on prepositions of space. In this study, the written CF was found to improve the accuracy in the new task with regard to the comparative, which might indicate that the learning process has begun. This result extends the findings of the written CF research, as it provides evidence that written CF has a short-term learning effect for rule-governed errors when targeting new linguistic structures (the comparative).

7.2.3 Long-term learning effect of written CF (new writing-delayed post-test)

The findings of this study show no long-term effect of written CF on the comparative. Although the students who received direct and indirect written CF improved their accuracy on the delayed post-test regarding prepositions, the control group also improved, so a long-term effect could not be claimed for prepositions. Therefore, no long-term effect was found in this study for either linguistic structure.

The majority of the recent written CF studies which targeted focused linguistic structures (e.g. Rummel, 2014; Bitchener and Knoch, 2010a; Sheen et al., 2009; Bichener, 2008; Bitchener and Knoch, 2008; Ellis et al., 2008; Sheen, 2007) reported both short- and long-term effects of written CF. However, one of the differences between these studies and the current study is that the former targeted 'already learned' linguistic structures while the current study targeted 'newly-learned' linguistic structures. As explained in the literature review chapter, this study sought to fill in a gap in the literature and contribute to the written CF research by examining whether written CF on newly-learned linguistic structures has the potential to improve the grammatical accuracy of the students.

In this study, each linguistic structure was introduced once (40 minutes of instruction) before the students received the treatment. They received written CF twice; once on their pre-test

and once on their immediate post-test. The students did not receive any extra formal instruction or practice (writing and written CF) on these linguistic structures between the immediate and the delayed post-test, which was performed six weeks after the pre-test.

The lack of a long-term effect found in this study could be explained by the theories of how new L2 is developed. Housen and Pierrard (2006, p.6) suggested that new L2 knowledge is developed through three sequential processes; knowledge internalization, knowledge modification and knowledge consolidation. In knowledge internalization, learners receive the new input and establish form-meaning connections. In knowledge modification, learners receive additional input (positive or negative-written CF), modify and test hypotheses and restructure their L2 knowledge (Williams, 2012, p.322). In knowledge consolidation, the L2 knowledge is strengthened via practice (including written CF) and the retrieval of L2 knowledge becomes more accurate and faster (Housen and Pierrard, 2006, p 6).

In this study, the students were likely to have been at the stage of developing their explicit knowledge regarding the targeted linguistic structures (the comparative and prepositions of space), a position between knowledge internalisation and knowledge modification. Some students might have been trying to make form-meaning connections, hypothesizing, modifying and restructuring their new L2 knowledge. The lack of any reinforcement or practice (written CF) between the immediate and the delayed post-test probably caused the decline in the performance of the students in the long-term (for the comparative). Some of the students might simply have forgotten the grammatical rules or mixed them up.

Bitchener and Ferris (2012, p. 12), drawing on the skill acquisition theories of McLaughlin and Anderson, viewed practice as a key element in the cognitive processing of explicit knowledge, and proposed that explicit knowledge could be converted into implicit knowledge via practice. In the current study, the explicit knowledge of the linguistic structures (the comparative and prepositions of space) had recently been established. The students did not receive sufficient opportunity to proceduralize this explicit knowledge via practice (more episodes of written CF). Two written CF episodes might have been insufficient to produce a long-term learning effect. It could be argued that the lack of practice (practicing linguistic structures in writing and receiving more written CF) between the immediate and delayed post-test might have been the reason for the lack of a long-term learning effect for written CF found in this study.

The lack of a long-term effect of written CF found in this study did not necessarily mean that the written CF was completely ineffective, however. If the students had practiced these linguistic structures, through receiving more episodes of written CF, the results might have shown more positive trends regarding the efficiency of written CF or, if the interval between the pre-test and the delayed post-test had been less than six weeks, the results might have shown some long-term effect. Thus, longitudinal studies, where the students receive a series of episodes of written CF, may better capture the long-term effect of written CF (Bitchener and Storch, 2016) in improving the grammatical accuracy of students with regard to newly-learned linguistic structures.

It could be argued (e.g. Truscott, 1996) that written CF is ineffective and that it is better for teachers to direct their attention and efforts toward providing students with extra practice rather than written CF. I think that practice (instruction) is important as it provides students with extra positive input of the targeted linguistic structures. However, students need to produce output (writing) in order to learn how to use the linguistic structures (Swain, 1995). Output provides learners with the opportunity to test their hypotheses about L2 (Swain, 1995). Since errors are unavoidable and learners are expected to commit them in their output-writing, the role of written CF is justified. Learners need written CF in order to notice the gaps in their writing and to understand how to resolve them. I believe that, without proper feedback, the errors of learners can become fossilized.

Moreover, some written CF studies (e.g. Van Beuningen et al., 2012) examined Truscott's claim that practice is more beneficial for learners than written CF. Van Beuningen et al. (2012) included two control groups in their study design: one group received practice activities without any written CF and the other control group received no practice and no written CF. They found that the two groups which received written CF (direct CF group and indirect CF group) outperformed the practice group and the control group. This finding provides an evidence that written CF is more beneficial for L2 learners than practice alone.

To summarize the findings for research question one: the results of this study show that written CF helped the students to improve their accuracy during their revision with regard to both linguistic structures (the comparative and prepositions of space). Although the control group improved their accuracy during revision regarding the comparative, their performance on the immediate post-test declined, while the performance of the treatment groups increased. This might provide an indication that the control group was affected by the lack of (written)

CF on their initial task (pre-test). There was no long-term effect for either linguistic structure. Chapter Five, in section 5.2.1.3, some possible reasons for why the three groups' performance decreased in the delayed post-test in the use of the comparatives were provided, and in Chapter Five, section 4.2.2.3, some possible explanations for why the three groups' performance increased in the delayed post-test in the use of prepositions of space.

A short-term effect (new task) was only found regarding the comparative but not prepositions of space. This important finding will be discussed in more detail in relation to the next research sub-question, 1a.

7.3 Findings regarding research sub-question 1a

Does the effectiveness of written CF vary according to the targeted linguistic structure (the comparative versus prepositions of space)?

In the written CF research, there has been a debate about the types of written errors which are more responsive to written CF. It has been suggested that some errors are more amenable to correction (Ferris, 1999). Ferris (1999, p. 6) classified errors as 'treatable' and 'untreatable' and suggested that treatable errors are those errors that follow strong rules (e.g. verb forms and tenses, subject-verb agreement, article usage, plural and possessive noun endings). Untreatable errors (e.g. lexical errors, sentence structure errors, missing words, unnecessary words, word order errors) are idiosyncratic so learners are required to utilize their acquired knowledge of the language to resolve them. Bitchener and Storch (2016, p. 53) refer to errors which follow strong rules as 'rule-based' and to untreatable, idiosyncratic errors as 'item based'. Most focused written CF research, which targeted rule-governed errors, found that written CF was effective (e.g. Bitchener and Knoch, 2010a, 2010b, 2008, 2009b; Bitchener, 2008; Ellis et al., 2008; Sheen, 2007). Item-based errors, on the other hand, were found to be less responsive to written CF (e.g., Guo, 2015; Bitchener et al, 2005).

This study examined two linguistic structures which vary regarding the degree to which they are rule-governed. The comparative is 'rule-governed', as students can refer to strong grammatical rules to resolve their errors. Prepositions of space are described as 'less rule-governed' in this research. The use of some prepositions depends strongly on the context and, although some of these have grammatical rules, there are a lot of exceptions, so learners are less likely to benefit from referring to grammatical rules when writing and resolving their errors.

The current study provides evidence for a short-term learning effect of written CF on rule-governed errors (the comparative). This finding contributes to our understanding of the effectiveness of written CF regarding rule-governed errors, as errors related to the comparative have not been researched as a separate category in the previous research. The majority of the previous research examined the simple past tense and English articles, as 'rule-governed' errors.

No short-term learning effect was found for less rule-governed errors (prepositions) in the current study. This finding was similar to that of other research that targeted prepositions (e.g. Guo, 2015; Bitchener et al, 2005). For example, Bitchener et al. (2005) targeted all types of prepositions and found that they were less responsive to written CF compared to the rule-governed linguistic structures targeted in their study. Guo (2015) examined prepositions of space as a separate category and found that written CF was ineffective for improving the grammatical accuracy of Chinese learners.

The finding of the current study confirms the hypothesis that students might benefit from written CF for rule-governed errors, while less rule-governed errors are less responsive to written CF. As suggested by Bitchener and Storch (2016), learners might be better able to form correct hypotheses when receiving written CF on rule-governed errors as they can reflect on and retrieve the rules from their long-term memory. With idiosyncratic and less-rule governed errors, students may be less likely to form a correct hypothesis and, if they do, the correct hypotheses in one instance might not be useful for another (Bitchener ans Storch, 2016). For example, regarding prepositions, written CF on 'in the house' might not help the student to produce a sentence in subsequent writing that includes the phrase 'at home'. Students who attempt to apply rules to prepositions of space could encounter problems because the rules governing prepositions are opaque and have numerous exceptions. Therefore, the students may need to learn them contextualised in prepositional phrases (e.g. "I am on the bus"; "I am at home").

The finding for the control group during revision was interesting because of its relevance to the learners' ability critically to evaluate rule-governed linguistic structures even without written CF, but not less rule-governed linguistic structures. This suggests that, by critically examining their writing, the students might be able to resolve their rule-governed errors, even without written CF. With less rule-governed error (prepositions), the case might be different,

as the findings of this study show that the control group's accuracy regarding preposition use was negatively affected by their lack of written CF during revision.

7.4 Findings regarding research sub-question 1b

Does the effectiveness of written CF vary according to the type of feedback (direct CF and indirect CF)?

It has been suggested that the level of explicitness of written CF may determine whether or not learners comprehend or understand the feedback (Bitchener, 2017). In more recent years, researchers have become more concerned about the relative effectiveness of different types of written CF in improving the grammatical accuracy of learners and whether learners benefit more from explicit (direct) or implicit (indirect) types of written CF. Direct written CF consists of an indication that an error has been made, such as underlining and the provision of corrections, while indirect written CF consists only of an indication that an error has been made and leaves the learner to resolve it. The relative effectiveness of these two types of written CF carries some theoretical implications.

Theoretically, some researchers believe that indirect CF (e.g. underlining errors and using codes) requires learners to engage in guided learning and problem-solving, so it promotes the type of reflection that fosters acquisition (Lalande, 1982, p.140). Indirect CF also has the potential to engage students in problem solving and push learners to engage in hypothesis testing once their error has been pointed out. This process induces deeper internal processing and promotes the internalisation of the correct linguistic structures (Ferris, 2002). Other researchers (e.g. Bitchener and Knoch, 2010b) point out that direct CF is more helpful for learners because it is more immediate, offers explicit feedback on hypotheses that may have been made and it provides learners with information that may help them to resolve complex errors (Bitchener and Knoch, 2010b).

The relative effectiveness of direct and indirect written CF has pedagogical implications as well (Ferris and Roberts, 2001, p.162). Direct written CF is more time-consuming, as teachers need to provide corrections for their students. Indirect written CF, on the other hand, is less-time consuming and more practical for teachers to provide because they simply underline the errors without writing any corrections. Moreover, there is a much greater chance that teachers will miss-correct an error if they provides direct written CF rather than simply underlining it (Ferris and Roberts, 2001, p.162). The findings for the relative

effectiveness of direct versus indirect written CF are discussed based on the different types of tests (revision, immediate post-test and delayed post-test):

7.4.1 Relative effect of direct versus indirect CF during revision

Several written CF studies (e.g. Van Beuningen et al., 2012; Chandler, 2003) have examined the relative effectiveness of direct and indirect written CF during revision. In Chandler (2003), the students who received direct CF outperformed those who received indirect CF during revision, although there was no statistically significant difference between the two types of written CF. Chandler (2003, p. 291) explains that, when students see their errors corrected, it is possible that they internalize the correct form more effectively whereas, with indirect CF, they lack sufficient information to resolve their errors (Chandler, 2003, p. 291). In Van Beuningen et al. (2012, p. 35), although the results did not show any significant difference between direct and indirect CF, the effect of the former was greater than that of the latter. In their study, the students who received direct CF corrected 78% of their initial errors while the group which received indirect CF corrected 64% of them (Van Beuningen et al., 2012, p. 35).

In this study, the students were asked to revise their writing after receiving written CF to see if they had learned anything from the feedback and were able to make accurate use of that learning during revision. The results of the quasi-experiment showed that written CF of both types (direct and indirect) helped the students to improve their grammatical accuracy during revision for both linguistic structures (the comparative and prepositions of space), but a significant effect was only found for direct written CF. This finding is similar to that of Chandler (2003) and Van Beuningen et al. (2012). In this study, the superiority of direct CF during revision was anticipated since this entails errors being underlined and corrections being provided, so the learners needed only to notice and use these corrections during their revision.

Comparing indirect with direct written CF, the students needed to process the former with more cognitive effort because the corrections were not provided for them. The groups in this study were mixed ability (high, medium and low proficiency level students). The higher proficiency level students may have been better able to process the indirect written CF during their revision because they had better existing knowledge, while the lower proficiency level students might have found it difficult to do so. Therefore, the results of the indirect CF group for revision may have been affected by the performance of the low proficiency level students,

who may have found it difficult to process the indirect CF during their revision due to their limited existing knowledge. This point will be discussed further in Section 6.5.

7.4.2 Relative effect of direct versus indirect CF on new writing (immediate post-test and delayed post-test)

7.4.2.1 The comparative

In the current study, both the direct and indirect CF groups improved their accuracy in new writing on the comparative. However, the indirect written CF group's improvement in accuracy was higher than that of the group which received direct CF. This result is interesting because, during revision, the direct group performed better than the indirect group while, in the new writing task (immediate post-test), the reverse was found. This might indicate that the indirect written CF group processed the feedback in greater depth, which means that they might have attempted to reflect on their metalinguistic knowledge and understand why their initial hypothesis was incorrect.

In the delayed post-test, although both the direct and indirect CF groups' accuracy declined, that of the former was greater than that of the latter. The students in the indirect written CF group might have been engaged in guided learning and problem-solving and may have been pushed to engage in hypothesis testing (Lalande, 1982, p.140). Some researchers argue that the deep processing of indirect written CF may induce both a short- and long-term learning effect (Lalande, 1998, Ferris, 2001). This might explain why the indirect CF group maintained a higher level of performance than the direct CF group in the long-term. The direct written CF group, on the other hand, might have depended more on memorization, which easily decays over time.

There is some research which supports the potential of indirect written CF. For example, Lalande (1982) reported a reduction in students' errors using indirect CF. Eslami (2014) found that the indirect CF group outperformed the direct CF group on the immediate post-test and delayed post-test. Ferris (2006) also found that indirect CF was superior to direct CF in terms of facilitating accuracy over time.

7.4.2.2 Prepositions

While the improvement of accuracy of the direct and indirect CF groups was sustained in the new writing (immediate post-test) on the comparative, no short-term learning effect for either type of written CF (direct and indirect) was found with regard to prepositions of space.

Therefore, in this study, direct and indirect written CF have a short-term learning effect on 'rule-governed' linguistic structures (the comparative), but no short-term learning effect was found for either type of written CF with regard to a 'less rule-governed' linguistic structure (prepositions of space). Both groups which received direct and indirect written CF improved their accuracy on the delayed post-test but, since the control group improved their accuracy as well, a long-term effect for written CF cannot be claimed in the current study. One could argue that learners might need more explicit types of written CF to resolve prepositions of space errors. However, Guo (2015) found that even with direct plus metalinguistic explanation, learners were not able to significantly improve their short and long-term accuracy in the use of prepositions. Guo (2015) explained that no significant effect was found for prepositions in his study because prepositions required in two pieces of writing might be different.

Moreover, written CF might help learners to develop their explicit knowledge on a certain instance of preposition of space (e.g. pre-test), but the knowledge might not be applicable in another subsequent piece of writing (e.g. immediate post-test) due to differences in linguistic context. However, that knowledge of preposition might be helpful when it is used in a later similar context (e.g. delayed post-test). This might be a possible reason for why, in this study, the students' performance in the immediate post-test declined, while it increased in the delayed post-test. For more explanations, please read Chapter Five, section 5.2.2.3.

7.5 Findings regarding research sub-question 1c

Does the effectiveness of indirect written CF vary according to the proficiency level of the students (higher versus lower level)?

There is a theoretical claim that indirect written CF might be less helpful for lower proficiency level students because they may possess insufficient linguistic knowledge to apply effective corrections (Ferris, 2004; Ferris, 2006; Hyland and Hyland, 2006). This led to the expectation that higher proficiency level students will benefit more from indirect written CF than lower proficiency level ones.

In this study, the proficiency level of the students had an influence on the effectiveness of indirect written CF on the comparative but not on prepositions of space. A possible explanation for this might be that the comparative is rule-governed, so the higher proficiency level students were able to refer to and retrieve their knowledge of grammatical rules from long-term memory when processing the indirect CF and resolving their errors. The lower

proficiency level students, on the other hand, may have found it difficult to process the indirect CF due to their limited existing knowledge and lower cognitive capacity; for example, their short-term memory needed to process corrections was limited. Because of this, their performance during revision, the immediate post-test and delayed post-test was lower than that of the higher level group when using indirect CF.

No influence of proficiency level was found regarding the effectiveness of indirect CF on prepositions of space, possibly because prepositions are less rule-governed. The higher level students who received indirect CF did not achieve greater improvement than the lower level students during revision and on the immediate post-test. One possible explanation for this was that the higher proficiency level students may have tried to apply the rules to resolve their errors and applying rules to prepositions may at times cause errors because the rules governing prepositions are unclear and have exceptions. Furthermore, the use of prepositions can depend on the context, so referring to grammatical rules is less likely to prove helpful in resolving preposition errors. Therefore, the students (higher and lower level) needed to learn the prepositional phrases (e.g. 'on the bus', 'at home') in order to be able to understand and resolve their preposition errors.

Van Beuningen et al. (2012) investigated whether the proficiency level mediates the effectiveness of indirect written CF. They found no significant interaction between the effectiveness of the CF treatments and the learners' proficiency level. They concluded that this might be because the difference between the levels included in their study was insufficiently large (Van Beuningen et al., 2012, p. 34). They also explained that their study was conducted in a context which is similar to a natural SLA environment. The students started learning Dutch at an early age and L2 was the means rather than the goal of the instruction. Therefore, the level of the students' metalinguistic awareness was too low for them to benefit fully from indirect written CF. Guo (2015) examined the influence of the proficiency level of the students on the effectiveness of different types of written CF on different types of error (regular and irregular past tense and prepositions of place). Proficiency level was not found to moderate the effectiveness of the written CF on the three targeted linguistic structures. The researcher concluded that the difference in the scores of the two proficiency level groups was insignificant (Guo, 2015, p. 204).

The context of the current study might explain why its finding conflicts with those of previous studies (e.g. Guo, 2015; Van Beuningen et al., 2012) regarding the role of

proficiency level on the effectiveness of indirect CF. This study was conducted in an EFL context, where the classes are mixed-ability, as dictated by the Ministry of Education (MOE) regulations in Oman. English was the goal of instruction and there was a focus on grammar and form. It was expected, therefore, that the higher proficiency level students would benefit more from indirect CF because they might have better metalinguistic competence than lower proficiency level students. Metalinguistic competence means that the students have the ability to understand grammatical rules, explicitly articulate them and apply them in their speaking and writing.

To conclude, the proficiency level of the students in this study was found to influence the effectiveness of indirect written CF on rule-governed errors (the comparative) only and not on less rule-governed errors (prepositions). This finding provides a further explanation to what was found in response to research question 1b regarding the potential of indirect written CF for improving the grammatical accuracy of rule-governed errors (the comparative). Indirect written CF seems to be more effective for rule-governed errors in the case of higher proficiency level students, who might have a better existing knowledge of the grammatical structures and also a greater cognitive capacity than the lower proficiency level students, who lacked or had a limited existing knowledge of the grammatical rules and also a lower cognitive capacity.

7.6 Findings regarding research question two

How do the students repair their errors in response to direct and indirect written CF in their subsequent revision?

The majority of the research which examined the effectiveness of written CF used a quasi-experimental design, where evidence of the efficiency of written CF was measured by an increase in accuracy or a decline in errors on post-tests. The processing of the feedback and type of uptake by the students in response to the different types of written CF (direct and indirect) has been less thoroughly researched.

This study examined the effectiveness of written CF using both a quasi-experiment and TAP. The quasi-experiment provided data on the overall final performance of the groups, while the TAP provided data about how the students processed the direct and indirect written CF and the type of repair and needs-repair they made in response to each type of written CF.

In this study, examining the students' uptake and the type of repair they made in response to the direct and indirect written CF was triggered by the theoretical claim that the extent to which written CF is noticed and comprehended may depend on how explicit the feedback is. Students may notice and understand more explicit and salient types of written CF (Bitchener, 2017). This led to the expectation that the students would generate more repair and more repair with understanding in response to direct CF than to indirect written CF in this study, because the former was more salient, as errors were underlined and corrections provided.

As previously described, there is a belief among some teachers that direct written CF is more effective because it helps learners to resolve their errors (e.g. Albakri, 2015; Ferris, 2006). The demand to use comprehensive, direct corrections sometimes come from the school administrators and parents, as they believe that it is the teachers' responsibility to locate errors and provide corrections for the learners and that direct CF provides students with the information they need to resolve errors (Lee, 2003). Moreover, several studies (Alajmi, 2015; Amrhein and Nassaji, 2010) have found that students prefer direct CF and believe that it is more beneficial to them. These beliefs about direct CF motivated me to examine the uptake by students in response to direct and indirect written CF to determine whether or not the former is more beneficial than the latter in helping the students to understand and resolve their errors.

7.6.1 Students' uptake of direct CF during subsequent revision

The findings from the uptake analysis show that the direct and indirect written CF groups generated almost the same amount of repair during revision. The direct written CF group generated about 65% 'repair with understanding'. This means that the direct written CF helped the students to resolve their errors and understand the grammatical form. However, about 35% of the direct group's repair during revision was without understanding. For example, some students were successful in producing accurate sentences during their revision while at the same time providing inaccurate grammatical rules. This was similar to Zhao's (2010, p. 13) study. He found that 74% of the teachers' feedback was incorporated by the students during their revision, but that only 58% of that feedback was understood (Zhao, 2010, p. 13).

Noticing gaps is important but 'noticing with understanding' is necessary for the effective processing of L2 input-written CF (Schmidt, 1995, Bitchner, 2017). Relating this to Gass'

(1997, p. 5) computational model of L2 processing, learners need to notice L2 input with 'understanding' in order to move to the next, higher stages in the processing model: 'comprehended input', 'intake' and the production of accurate 'output'.

The findings from the quasi-experiment show that the direct written CF group significantly improved regarding both linguistic structures during revision. The findings from the uptake analysis (TAP) show that, although the direct CF generated a high percentage (65% of repair with understanding during revision), about 35% of their repair was not understood. This finding carries some important implications. Teachers need to bear in mind that noticing the direct written CF (noticing that some information has been added and/or noticing the mismatch between the student's output-error and the teacher's input-correction) does not necessarily mean understanding, especially for students with limited existing knowledge. The direct written CF, in that case, might lead to accurate revisions but not necessarily to accurate new writing. Zhao (2010, p. 5) points out that written CF which is noticed but not understood might lead to revision but not necessarily contribute to the development of L2 learners' long-term writing proficiency.

The findings from the quasi-experiment show that the direct written CF group outperformed the indirect written CF group during revision in the use of both linguistic structures (the comparative and prepositions of space). This finding might be expected and it is similar to some previous research findings (Van Beuningen et al., 2008) However, the TAPs findings show that not all of the direct written CF group's repair was with understanding as explained in the above paragraph. Therefore, using TAPs in the current research revealed another aspect of reality regarding the superiority of direct written CF over other types of less explicit written CF during revision. Another important point is that the TAPs analysis show that most errors in the direct written CF group in the use of the comparative came from the lower level students. So, the use of TAPs in this study helped in getting a better understanding of direct written CF.

7.6.2 Students' uptake of indirect CF during subsequent revision

The findings of the uptake analysis show that the indirect written CF group generated 73% of 'repair with understanding' in subsequent revision. This finding supports what was found in the quasi-experiment: that the indirect CF might have the potential to push students to engage in problem-solving and hypothesis testing and therefore process the feedback in more depth.

About 27% of the indirect CF group's repair was 'without understanding', which might indicate that the students were making guesses based on incorrect hypotheses. Most of the indirect group's errors during the revision were under the category of 'different errors' (44%). Committing different errors might mean that the students were guessing. It might also reflect the students' effort to try something different.

Regarding the finding regarding the students' response to indirect CF, it is worth highlighting here that most of the indirect group's repair with understanding was made by the average and high proficiency level students. This means that the low proficiency level students, who received indirect CF, were unlikely to have benefited from it. This finding suggests that the lower level students benefited less from the indirect CF on the comparative than the higher level ones. This finding suggests that the proficiency level of the students may influence their ability to repair errors in response to indirect written CF with understanding. This finding supports what was found in the quasi-experiment regarding research sub-question 1c that lower level students were less able to benefit from the indirect written CF than higher level ones in the use of the comparative. That is might be because the higher proficiency level students had better existing knowledge regarding the grammatical rules and use of the comparative.

However, it is important to note here that the written CF in this study is highly-focused, with only one linguistic structure being targeted per task. Therefore, indirect CF might be salient for the students and, because of this, they were able to achieve a good percentage of repair with understanding compared to when given direct written CF.

7.6.3 Response of the control group

The control group's findings from the uptake analysis were interesting. Out of 51 errors made on the pre-test, only nine (18%) errors were repaired during revision. About 56% of their errors were 'repaired without understanding'. This is a high percentage compared to the treatment groups. The direct CF group 'repaired without understanding' about (35%) of their errors, and the indirect CF group 'repaired without understanding' about (27%) of their errors. This might indicate that, although the control group repaired errors during their revision, most of this appears to have been based on guesswork (without understanding). On the other hand, the written CF helped both the direct and indirect groups to repair more errors with understanding during revision.

TAPs findings also might provide some possible explanations for why the control group's performance increased during subsequent revision in the quasi-experiment in the use of the comparative. TAPs findings show that 71% of the control groups' repair during revision in the use of the comparative was without understanding. This might suggest that most of the repair made by the control group in subsequent revision regarding the comparative was based on guessing rather than on understanding. The use of TAPs in the current study was complementary as it provided some possible explanation for the quasi-experiment findings. Without using TAPs, it would impossible to provide justifications and explanations for the quasi-experiment findings.

Looking at the type of errors committed by the control group during revision, 67% of these errors were categorized under 'same error'. Therefore, the lack of written CF on their pre-tests was likely to have caused the repetition of the same errors during their subsequent revision. The control group's performance during the subsequent revision was affected negatively by their lack of written CF. The findings for the control group provide further evidence of the effectiveness of written CF during subsequent revision.

7.7 Findings regarding research question three

Why was some written CF not incorporated by certain students into their subsequent revision?

It was unsurprising that the control group repeated a high percentage of the same errors during revision, since they did not receive any written CF on their pre-test. What was unexpected, however, was that both of the groups which received direct and indirect written CF on their pre-tests also repeated a high percentage of 'same errors' during their revision (direct written CF 63% and indirect written CF 38%). An examination of the students' tests showed that most of those who committed same errors during revision of the comparative were low proficiency level students (direct CF group 19 errors and indirect CF group nine errors). Regarding prepositions, the students from different proficiency levels repeated the same errors during their revision. The retrospective TAP provided some possible reasons why some of the written CF was not incorporated into the students' subsequent revision (focusing on why the students repeated the same errors).

7.7.1 Not noticing the gap

In the cognitive processing of input-written CF, Gass (1997) has shown that attention and noticing play a vital important role in the whole process. In order for feedback to be incorporated into learners' writing, it needs first to be noticed. Schmidt (1995, 2001) explains that noticing alone (being aware that some input has been provided) is insufficient. Noticing the gap is essential as learners need to be aware that there is a difference/mismatch between their output (the error) and the input provided by their teacher (the written CF), and noticing with understanding (having knowledge of the grammatical structures and rules) is necessary for effective processing of new L2 input-written CF (Schmidt, 2001).

The data from the TAP show that some feedback was not incorporated into the revision because of the level of attention that the students paid to the written CF. For example, a low proficiency level student who received direct written CF on the comparative repeated exactly the same errors during her revision. Data taken from her TAP script show that, although the student noticed the CF, her noticing was at a low level. She did not notice the gap between her errors and what the researcher provided (corrections) or she would have attempted to make repair/changes during her revision. She was neither 'noticing with awareness' nor 'noticing with understanding' the gap/mismatch. The following excerpt is taken from student S6's scrip and shows how the student was not able to notice the 'er' in the word 'short'.

Example 1:

7	R:	Is there anything wrong in the sentence?
8	S6:	(silence)..."long"
9	R:	Yes, what's wrong with it?
10	S6:	(silence)
11	R:	What do you want to say here?
12	S6:	[The student provided an accurate comparative sentence but in Arabic]
13	R:	How would you say that in English?
14	S6:	"Mary's' hair is long is Suzan's hair?"
15	R:	No, we need to add something to the word "long".
16	S6:	(silence)
17	R:	Look at example 1. Read it.
18	S6:	This one?
19	R:	Yes.
20	S6:	"Sally is shorter than John."
21	R:	Look at the word "short". How is it written in the sentence?
22	S6:	"short".
23	R:	No, read it from the sentence.
24	S6:	"shorter".
25	R:	Yes, so what has been added?
26	S6:	"is?"

7.7.2 Low cognitive capacity

Working memory and cognitive capacity are among the factors that may affect how learners process new L2 input (Bitchener and Storch, 2016). It has been hypothesized that high proficiency level learners have a higher working memory and cognitive capacity than low proficiency ones. A low working memory and cognitive capacity might be one of the reasons why some students repeated the same errors during revision despite the direct corrections they received regarding their pre-test in this study.

Some low proficiency level students with limited existing knowledge may find it difficult cognitively to process the written CF because of their low working memory and limited cognitive capacity. In order to notice gaps, encode linguistic structures and test new hypotheses, those students may need to process the written CF in a more consciously controlled manner, with the support of others. For example, those learners who found it difficult to notice and process the direct written CF may need to be pushed to notice gaps and understand the corrections, which might happen if the teacher interacts with and scaffolds them (Nassaji, 2017).

7.7.3 Students questioned and rejected the written CF

Noticing was not the only reason why some students repeated errors during their subsequent revision. Although the written CF was sometimes noticed, some students chose not to incorporate it into their subsequent revision. The findings of the TAP show that some of the students who noticed the teacher's written CF, either direct corrections or underlining, insisted on keeping their own words during their subsequent revision.

The TAP data show that these students questioned the written CF. They argued with the researcher about it and requested clarification. This finding is similar to what other research has found. For example, Swain and Lapkin (2002) found that some feedback was explicitly rejected by the learners because it did not match a rule that they had already internalised. The learners also rejected the written CF because they preferred to preserve their original meaning. They felt that, if they accepted the teacher's feedback, their intended meaning would become distorted. Macqueen (2012) also found that, despite the written CF provided by the teacher, some error patterns were resistant to change over time because of the learners' earlier instructional language experience.

These findings regarding the possible reasons why some students repeated the errors in their subsequent revision are interesting. They imply that some students, with very limited existing knowledge and a low cognitive capacity, might not notice the gaps in the written CF even if the written CF takes the form of direct corrections. The findings also suggest that not all of the written CF which was not incorporated into the students' subsequent revision or writing was unnoticed. Some students may deliberately choose not to accept feedback, at times, because it does not accord with a rule they have already internalised and their prior knowledge. These possible reasons were made apparent in the TAP data, when I further negotiated the written CF with those students.

These findings suggest that the students were thinking about the language even if they made incorrect choices. Those students who insisted on writing "in the bus" were following logic, as they understood the rule that, when something is in an enclosed area, they need to use "in". Because of that, they questioned the phrase "on the bus". Moreover, those students had already acquired the phrases "in the car" and "in the taxi", so they might find it difficult to learn "on the bus". This suggests that learning is not a linear process as, when students learn something new, they need to make sense of it, match it to their prior knowledge and create hypotheses about it. Students making errors regarding new linguistic structures can be a sign of that learning process. Thus, written CF can help the students to develop their L2 knowledge by supporting them to restructure their interlanguage.

7.8 Other findings

As explained in Chapter Five, the negotiated feedback was gathered in order to gain a better understanding of how the students dealt with written CF. There were some unexpected findings from this focus of the research, which I will discuss here.

7.8.1 Understanding why the students committed errors

While analysing the negotiated feedback (retrospective TAP), some of the reasons why the students committed errors started to emerge. In particular, the data suggested a strong relation between the learners' ability to articulate grammatical rules and their ability to produce accurate sentences. This was most obvious when the students discussed the feedback in relation to the comparative, probably because this grammatical structure follows strong rules. For example, S1 is a high level student, who was able to produce ten accurate sentences and

had the ability explicitly to articulate the grammatical rules during the introspective TAP, as shown in example 2 below:

Example 2:

Sent. 1
S1: "A lion is more dangerous than a sheep.", 'dangerous' is two syllables, so I added "more" here.

Sent. 2
S1: "Mike is older than Sam.", 'old' is one syllable, so we added "er", I do not add 'more' here.

Sent. 3
S1: "Mary's hair is longer than Suzan's hair.", I added 'er' because it is one syllable.. "long".

Sent. 4
S1: "Chair 1 is more comfortable than chair 2.", I added "more" here because "comfortable" is more than one syllable.

Sent. 5
S1: "A turtle is slower than a rabbit.", I add "er" here because it is one syllable, "slow", one syllable.

Sent. 6
S1: "Knife A is sharper than knife B.", I put "er" because "sharp" is one syllable.

Sent. 7
S1: "A car is more expensive than a bicycle.", I added 'more' because it is…"ex..pen..sive"…three syllables, so I added "more" because it is more than one syllable.

Sent. 8
S1: "Peter is stronger than Steven.", I added "er" because 'strong' is one syllable.

Sent. 9
S1: "A cheetah is faster than a turtle.", "fast" is one syllable, I added "er" here.

Sent. 10
S1: "Tim is smaller than David"… "er", I added "er" because "small" is one syllable.

However, in the case where students did not understand the grammatical rules, they made errors and could not explain them. Example 4 below shows a low proficiency level student (S5), who was unable to use the comparative form or articulate the grammatical rules for the comparative.

Example 4:

Sent. 1

S5: "A lion is… is", what is this word teacher?
R: "dangerous"
S5: "dangerous…A lion is…dangerous."
R: What did you write?
S5: "A lion is more dangerous."
R: Why did you add 'more' here?
S5: Because it is "more dangerous".

Sent. 2

S5: Mike [translate the sentence in Arabic/ accurate]. "Mike is old."
R: And what about Sam?
S5: "Sam is small."
R: What to use here, what is the grammatical rule?

S: (silent)

Sent. 3

S5: "Mary's hair is long Suzan's hair."
R: Please keep talking while you do the task, say why you are writing the sentence that way.

Sent. 4

S5: "Chair 1 is comfortable chair 2.", the first chair has wheels but the second one doesn't, "Chair 1 is comfortable chair 2."

Sent. 5

S5: "A turtle is slow rabbit.'' [Student provides an accurate targeted sentence in Arabic]

Sent. 6

S5: "Knife A is sharp B." [Student provides an accurate targeted sentence in Arabic]

Sent. 7

S5: "A car is bicycle expensive." [Student provides an accurate targeted sentence in Arabic]

Sent. 8

S5: "Peter..Steven...Peter is strong." [Student provides an accurate targeted sentence in Arabic]

Sent. 9

S5: "A cheetah is fast turtle." [Student provides an accurate targeted sentence in Arabic]

Sent. 10

S5: "Tim is small David." [Student provides an accurate targeted sentence in Arabic]. Can we add a word here teacher?
R: What do you want to add?
S5: ''Tim is small and David is big.''
R: No you can't add "big" to the sentence. Use only the words given in the picture.
S5: "Tim is small David."

This also became evident when the students discussed feedback on prepositions; some students found it hard explicitly to state the grammatical rules, especially regarding the use of the preposition "at", as illustrated in examples 5 and 6.

Example 5:

01 R: What was the grammatical rule you used to do the task?
02 S23: "on" {fouq} and "in" {dakhil}.
03 R: When do we use each one?
04 S23: We use "in" when something is inside, something like Noora in classroom.
05: R: And on?
06 S23: We use "on" when something is {fouq} something.
07 R: And 'at'?
08 S23: We use "at" with the singular.
09 R: What do you mean? Give an example?
10 S23: (silence)
11 R: Why "Jack at the reception desk"?
12 S23: Because "Jack" is at the "reception" alone, "singular".
13 R: No, look. Where is "Jack"?

Example 6:

01	R:	What was the grammatical rule you used to do the task?
02	S30:	(silence)
03	R:	When do we use “in, on and at”?
04	S30:	We use “on” for {fouq}, “in” for a classroom, for example, we use “at” when the picture has animals.
05	R:	Did you use this rule to do the task?
06	S30:	Yes, but this sentence is wrong.
07	R:	Which sentence?

The confusion over the use of the preposition “at” in particular might be due to the differences between L1-Arabic and L2-English (Almaflehi, 2013, p. 259). There is no equivalent preposition regarding “at” in Arabic. In Arabic, the preposition “fii” is used for both “in” and “at”. This might explain why most students struggled with the use of the preposition “at”.

Errors also occurred when the students misunderstood the rules, such as mixing them up. Example 7 below shows S3’s confusion. She understood the grammatical rule for the comparative but used ‘er-than’ for adjectives of two or more than two syllables and ‘more-than’ for adjectives of one syllable.

Example 7:

Sent. 1
S3: “A lion is dangrouser sheep. Mike and…”
R: What did you do in this sentence?
S3: I added ‘er’.
R: Why ‘er’?
S3: Because the word ‘dangerous’ is more than one syllable.
R: Do not forget to give a justification for each sentence.
S3: OK.

Sent. 2
S3: “Mike is big more old than Sam.”, “more old”, I added “more” here because it is more than one syllable.

Sent. 3
S3: “Marys’ hair is more long than Suzan’s hair.”, I added “more”…I wrote “more long” because “long” is one syllable.

Sent. 4
S3: “Chair 1 is comfortabler than chair 2.”, I added “er” because it is more than one syllable.

Sent. 5
S3: “A turtle is more slow than rabbit.”, “slow” is one syllable so we add more.

Sent. 6
S3: “Knife A is more sharp than knife B.”, we say “more”…yes “more slow” because “sharp” is one syllable, so add “more”.

Sent. 7
S3: “A car is expensiver than bicycle.”, I added “er” because it is more than one syllable..” exp...pens...sive”

Sent. 8
S3: "Peter is more strong than Steven.", "A cheetah is.."
R: Why did you add "more" here?
S3: Because it is one syllable, "strong" is one syllable.
R: Please keep justifying.

Sent. 9
S3: "A cheetah is more fast than turtle.", I added "more" because it is one syllable…"fast".

Sent. 10
S3: "Time is more small than David.", I added "more" because "small" is one syllable.

However, it was interesting to observe that, at times, students who produced accurate sentences could not explain why, as in example 8.

Example 8:

Introspective TAP:

Sent. 1
S2: "A lion is more dangerous than a sheep."
R: Why "more dangerous"?
S2: Because it is not an adjective.
R: What is not an adjective?
S2: "dangerous"…we cannot say "dangerouser."
R: Why?
S2: Because we cannot add "er" here because it is not an adjective.
R: Please give a justification for each sentence.

Sent. 2
S2: "Mike is older than Sam.", I added "er" to "old" because "old" is an adjective.

Sent. 3
S2: "Marys' hair is longer than Suzan's hair.", "longer", "longer than" because "long" is an adjective.

Sent. 4
S2: "Chair 1 is more comfortable than chair 2.", because "comfortable" is not an adjective.

Sent. 5
S2: "A turtle is slower than a rabbit.", because "slower…slow" is an adjective.

Sent.6
S2: "Knife A is sharper than knife B.", because "sharp" is an adjective.

Sent. 7
S2: "A car is more expensive than a bicycle.", because "expensive" is not an adjective, so we do not add "er".

Sent. 8
S2: "Peter is stronger than Steven.", because "strong" is an adjective.

Sent. 9
S2: "A cheetah is faster than turtle.", because "fast" is an adjective, so we add "er".

Sent. 10
S2: "Tim is smaller than David.", I added "er" because "small" is an adjective.

Retrospective TAP:

1 R: How was the task?

2	S2:	Good teacher.
3	R:	What was the rule you used to do the task?
4	S2:	When we make a comparative, we use “er” for adjectives and “more” for not adjectives.
5	R:	All of these are adjectives “fast...expensive...sharp...strong”.
6	S2:	We use “er” for small words like “short”, “small” and “more” for long words like “expensive".

S2 built her own grammatical rule (when we make comparatives we use 'er' for adjectives (e.g. short, long) and 'more' for not adjectives (e.g. expensive, popular)), and interestingly was able to complete the task. This may suggest that the students internalise their teachers’ explanations and instructions differently in the class. They think about the language and try to create hypotheses about the new things they learn. Thus, negotiated CF might help the students to modify their false hypotheses and restructure their interlanguage.

7.8.2 Understanding the students’ levels

In this study, the negotiation (retrospective TAP) also helped me to discover the developmental levels of the different students. I started the negotiation of written CF from implicit to more explicit. First, I asked the student to look at her task and check it for errors. If she failed to point out her errors, I directed her attention to the sentences which contained errors. If the student failed to recognise the error, I provided her with examples, such as those at the top of page one. The assistance became more explicit if the student was unable to notice and resolve the error. The scaffolding from implicit to explicit helped me to discover the current developmental levels of the students.

Moreover, the negotiation revealed some interesting findings, as it showed that the students varied in terms of their ability to benefit from the one-to-one assistance. Some students knew the comparative rules but committed errors because they were confused about the number of syllables within adjectives. For example, S9, a medium level student (example 9), understood the grammatical rule but thought that “strong” had two syllables, so she added “more stronger than”.

Example 9:

25	R:	What about sentence 8?
26	S9:	“Peter is more strong than Steven?”
27	R:	Yes.
28	S9:	Because it is two syllables I added “more”.
29	R:	What is two syllables?
30	S9:	“strong”
31	R:	Is it two syllables?
32	S9:	“strong”, one, teacher.

33	R:	Yes, one.
34	S9:	We add “er”.
35	R:	Yes.

However, other students struggled to benefit from the scaffolding. For example, with the student in example 10 (below) I asked her to look at her sentences and see if there were any errors. When she was unable to recognise the errors in her sentences (not using the comparative form), I tried to provide her with some clues, such as reading the examples provided at the start of the task, to enable her to recognise the 'er' in the word 'short'. When reading the sentence, the student directed her attention to the verb “is”. The student was able to provide an accurate translation of the comparative sentences in Arabic, but unable to either explicitly state the comparative rules or apply them and produce accurate comparative sentences in English.

Example 10:

01	R:	Have you finished?
02	S5:	Yes, teacher.
03	R:	Did you check errors? What about sentence 1?
04	S5:	'dangerous'?
05	R:	Yes, read the sentence please.
06	S5:	‘’A lion is more dangerous.’’
07	R:	Why you added 'more' here?
08	S5:	Because it is ‘’more dangerous’’
09	R:	Can you explain more?
10	S5:	(silent)
11	R:	Ok, what about other sentences?
12	S5:	‘’old’’
13	R:	Yes, what did you write?
14	S5:	‘’Mike is old.’’
15	R:	Do you need to make changes in the sentence?
16	S5:	(silent)...’’is’’, I added ‘’is’’
17	R:	Why you added ‘’is’’?
18	S5:	Because singular.
19	R:	What is singular?
20	S5:	‘’Mike’’
21	R:	Yes we add ‘’is’’, but there is something else missing, have you read the examples?
22	S5:	Yes.
23	R:	Could you please read example number 1?
24	S5:	‘’Sally is shorter than John.’’
25	R:	So what is added in the adjective?
26	S5:	‘’is’’, ‘’is short’’
27	R:	Not ‘’is’’, look at the word ‘’short’’, how it is used in the sentence? Any changes?
28	S5:	‘’shorter’’
29	R:	Yes, why ‘’shorter’’?
30	S5:	(silent)
31	R:	Because the word ‘’short’’ is one syllable, so we add ‘’er_than’’ to make comparative, to compare Sally and John. So what to write for sentence 2?

7.8.3 Understanding the students' cognitive processes

From a cognitive perspective, one possible reason for the low level students' failure to use the comparative forms and finding it difficult to understand the comparative grammatical rules is that they might be weak at language analytics. Sheen (2007, p. 259) explains that language analytical ability is the ability to analyse language by creating and applying rules to new sentences. Bitchener and Ferris (2016) point out the high ability students benefit more from direct CF and direct metalinguistic feedback than learners with low ability. Sheen (2007) examined whether language analytical ability mediates the effects of written CF on the use of English articles. She found a significant association between gains in accuracy and the learners' analytical ability. Students with a high level of language analytical ability benefited more from both direct CF and direct CF plus metalinguistic feedback.

7.8.4 Understanding the zone of proximal development, ZPD

Negotiated CF in the current study also helped me to understand why scaffolding was ineffective for some low level students from the socio-cultural theory perspective. I believe that, in some cases, I misjudged the students' current ZPD and provided scaffolding at a higher level than that with which they were able to cope.

This observation may alert us to consider what effective scaffolding is. Drawing on Bruner, scaffolding in a learning environment is support from a teacher to a student to help him/her to construct new skills or knowledge. Scaffolding is effective when it is provided in the learners' current ZPD to help them to accomplish a task or develop a new understanding, so they will be able later to do the task alone (Hammond and Gibbones, 2005, p. 9). Effective scaffolding needs to address the individual learners' current needs and push him/her to move to a higher zone than his/her current one. Therefore, scaffolding is ineffective if it is provided above the current ZPD of a learner. When scaffolding the (low level) students in this study, I expected that they would know at least something about the targeted grammatical rules, whereas I discovered that the knowledge of some students was very limited. My observation about scaffolding might suggest that, in order for teachers to provide effective scaffolding for their students, they need first to understand what the learners do and do not know at the beginning of an activity (Gibbones, 2015; Hammond and Gibbones, 2005).

The negotiation of feedback in this study also made me think about written CF from a socio-cultural perspective. Direct and indirect written CF are unidirectional with no interaction

between the teacher and the student (Nassaji, 2017). The teacher is the provider of the feedback and the student is the recipient. One of Truscott's (1996) arguments against error correction is that the teacher does not understand the cause of the error and so will be unable to provide the appropriate treatment. When teachers negotiate the feedback, they will be able to understand the students' current developmental level, devise appropriate treatments and provide effective scaffolding. My study suggests that, when students have good linguistic analytics, then they are able to cope with unidirectional, unmediated feedback but, when they have low levels of English/poor linguistic analytical ability, even mediated feedback can be ineffective.

The use of TAPs in the current study was very important and provided complementary data to that of the quasi-experiment. Without using TAPs, I would not be able to provide some justifications and explanations for some of the quasi-experiment findings. The quasi-experiment show that the direct written CF group achieved significant performance during subsequent revision. TAPs findings show that not all direct written CF was understood. The quasi experiment findings show that the control group improved performance during subsequent revision in the use of the comparative. TAPs findings show that 71% of the control groups' repair was without understanding. Without TAPs explanations for the quasi-experiment findings would be impossible.

Moreover, without TAPs it would be impossible to understand why some direct and indirect written CF was not incorporated in the students' subsequent revision and why some certain learners (e.g., lower level students) failed to benefit from written CF.

To summarize, this chapter discussed the quasi-experiment and the TAP findings. In the discussion, I drew on the previous written CF research and relevant SLA theories. In the next chapter, the implications arising from the current research will be discussed. The pedagogical, methodological and theoretical contributions of the research will be explained, and recommendations for future research will be offered.

CHAPTER EIGHT
Conclusion

8.1 Introduction

This chapter will discuss the contributions of the current research then, based on the current research findings, provide some recommendations for future research.

8.2 Pedagogical contribution

8.2.1 Effectiveness of written CF on newly-learned linguistic structures

Most of the existing written CF research targeted already-learned linguistic structures. Researchers used pre-existing groups to implement the quasi-experiment without the need to teach the linguistic structures because these have already been introduced to the learners. By targeting already-learned linguistic structures, it could be argued that the learners have an opportunity to practise these linguistic structures in their writing and might have received previous written CF on them. It is possible that the long-term effect which was found in the previous research was not purely because of the effect of the one or two shots of written CF assessed. The significant long-term improvement identified by these studies could be due to the cumulative effect of previous exposure to the linguistic structures and previous written CF together with the experimental use of CF.

The results of the current study found a short-term effect of written CF with regard to the comparative only, but the two treatments of written CF were insufficient to have a long-term effect on either of the newly-learned linguistic structures. I think that there is a need to explore whether direct and indirect written CF have an effect when targeting other categories of newly-learned linguistic structures. Moreover, more research is needed to explore the different strategies of written CF regarding different categories of newly-learned linguistic structures in order to be able to draw firm conclusions that written CF is effective in improving the accuracy of learners regarding newly-learned linguistic structures.

2.2.2. Effectiveness of written CF on new categories of written CF

Previous studies which investigated the effectiveness of written CF on focused linguistic structures targeted limited categories of errors. Most of the previous written CF research which targeted 'rule-governed' errors focused on definite and indefinite articles (e.g., Bitchener, 2008; Bitchener and Knoch, 2008, 2009a, 2009b, 2010a, 2010b and Sheen, 2007a). Some studies targeted the simple past tense (e.g., Bitchener et al., 2005; Guo, 2015 and Rummel, 2014) while others (e.g., Shintani et al., 2014) targeted the hypothetical conditional.

The current study contributes to the written CF research by targeting the comparative, a new category of 'rule-governed' error. A short-term effect was found for the comparative in this study, which confirmed the hypothesis that students would benefit more from written CF on 'rule-governed' errors because they could refer to the rules when resolving their errors. This finding was in line with the previous research which found that written CF was effective in improving the grammatical accuracy of students regarding rule-governed linguistic structures (e.g. Bitchener et al, 2005). Targeting new categories of errors is important to confirm or disconfirm hypotheses about the effectiveness of written CF on different categories of 'rule-governed' errors. The findings regarding prepositions of space in this study confirmed the hypothesis that less rule-governed errors, such as prepositions of space, are less responsive to written CF because learners are less likely to refer to the grammatical rules when resolving their errors (Guo, 2015; Bitchener et al., 2005), so the findings of this research contribute to the written CF research as they support previous findings regarding rule-governed and less rule-governed errors.

8.2.3 Proficiency level

One of the most important contributions of this research was that it found that the proficiency level of the students might play a major role regarding how they respond to and process written CF. The findings from the quasi-experiment show that the higher proficiency level students benefited more from the indirect written CF than the lower proficiency level ones regarding the comparative, because they may have a higher existing knowledge and cognitive capacity.

The findings from the TAP also provide evidence that individual differences may play a role in how the students process CF from both the cognitive and socio-cultural perspectives. The TAP findings show that the low proficiency level students found it difficult to notice the gaps and process the written CF while the higher proficiency level ones performed these two activities

more effectively. Data from the retrospective TAP show that the higher proficiency level students were able to benefit from scaffolding once their errors had been highlighted, while the low proficiency level ones struggled to notice the gaps and understand the grammatical rules, and so benefited less from the scaffolding.

8.2.4 Current feedback practices in the Omani EFL classroom

As explained in Chapter One, direct and indirect written CF are the most popular written CF strategies used in Cycle Two Basic Education Schools in Oman. The findings of the current study have implications regarding the teachers' practices related to employing these two strategies of feedback in the EFL classroom in Oman. Direct CF is preferred by many teachers in Oman due to the low proficiency level of the students and also the demand by the school administration. The teachers believe that the students need to receive direct corrections, otherwise they might be unable to recognize and resolve their errors. This appears logical but the current study's findings suggest that direct CF might not be explicit enough for some (low proficiency level) students, who may lack existing knowledge. The students might copy their teachers' corrections during their revision but without understanding. Therefore, it is likely that these students will fail to benefit from the CF in their future writing (Zhao, 2010). Personally, this was one of the most serious problems I faced with my students. Some students keep repeating the same errors, regardless of the extensive direct CF they had received. Teachers need to bear in mind that direct CF might be insufficiently explicit to enable some (low proficiency level) students to understand their errors. Teachers might expect students to refer to the grammatical rules in their course books, but some students disregard these or, if they do refer to them, they might find it difficult to read and understand the grammatical explanations due to their low language analytical ability (Sheen, 2007). Therefore, I believe that the time spent providing ineffective direct CF to these students would be better directed toward devising more efficient treatments and practice.

Another important point I would like to raise here is that the teachers and students seem to underestimate the value of indirect CF (Al Bakri, 2015; Al Ajmi, 2015). Although indirect CF is less preferred by Omani students (Al Ajmi, 2015), the findings of the current study suggest that it might have the potential to help high proficiency level learners to resolve their rule-governed errors. Indirect CF engages students in "guided learning and problem solving" Lalande (1982, p. 143). Indirect CF promotes learners' reflection on their linguistic knowledge, and so may foster long-term acquisition (Lalande, 1982). Indirect CF is less time-

consuming (Ferris and Roberts, 2001), so teachers can utilize it with high proficiency level students on rule-governed errors. I believe that indirect CF might motivate these students, support them to develop problem solving skills and help them to be more independent learners.

The findings of the current research also show that the effectiveness of written CF might be moderated by certain factors, such as the type of targeted linguistic structure and the proficiency level of the learners. In the current study, direct and indirect written CF had a short-term effect when targeting rule-governed errors (the comparative) but not less rule-governed errors (prepositions of space). This suggests that different types of errors should be treated differently. Less rule-governed errors (prepositions of space) may require more explicit types of CF due to their complexity and lack of strong rules to follow. The findings of the current study also show that individual differences may affect the way in which the student's respond to/process direct and indirect CF, as explained in section 8.2.2 in this chapter. However, EFL teachers in Oman do not address these factors in their feedback practices. Teachers provide direct or indirect CF on all types of errors, and to all students in the class, regardless of their proficiency level.

Moreover, while conducting this research, I came across other strategies of written CF that might be effectively utilized by Omani EFL teachers. For example, teachers can use error codes, metalinguistic clues, direct CF plus written metalinguistic explanations, direct CF plus oral metalinguistic explanations and scaffolded CF (Ellis, 2009), so there are diverse strategies of written CF from which teachers can choose the method that is most suitable for their students' needs, rather than restricting themselves to direct and indirect CF only. Moreover, all strategies of written CF might be effective but it depends when, how and as to which one should be used.

I believe that one of the current study's contributions is that it highlights these important issues about written CF and suggests teachers consider them in their future feedback practices. Teachers are expected to educate themselves about written CF by reading books and listening to tutorials that may provide some guidelines about what, when and how feedback can be effective. It is also helpful to know about teachers' practices in other educational cultures. For example, Alexander (2001) identified that in Russia it is common for one student to go to the front of the class and thereby represent the whole class. The student then takes part in a series of questions and answers with the teacher. Teachers can use TAPs to negotiate individual students' errors. The teacher can use the class time to discuss a student's errors with her in

front of the class, perhaps using an overhead projector or Power-Point. Other students can learn from watching and listening to the negotiation that takes place between the teacher and student. The teacher can choose a different student to negotiate feedback each time. Another way is to divide the class into groups according to their proficiency level. Based on the students' performance and the errors they commit, the teachers can further negotiate CF with students to understand the difficulties they face. This will help the teachers to design differential treatment tasks to support individual students.

8.2.5 Teacher training in Oman

As explained in Chapter One, one of the aims of the education reform in Oman, which was launched in the academic year 1998-1999, was to introduce communicative approaches and student-centered approaches to EFL teaching (MOE, 2004a). However, some teachers struggle to implement these approaches in the classroom. Al Mahrooqi (2011) found that there exists a disparity between theory and practice in the initial ELT training program for prospective teachers at SQU, Sultan Qaboos University. Although the Ministry of Education provides in-service training, the teachers believe that these programs fail to meet their needs as they do not address the challenges they face in the EFL classroom (Al Rasbiah, 2006).

I believe that written CF is one of the teaching pedagogies that should be addressed in teachers' pre- and in-service training programs in Oman. Input on the pedagogical importance of written CF in L2 learning, the different strategies of written CF, and the factors that may moderate the effectiveness of the different strategies would help teachers to decide what kind of feedback to deliver, when and to which students. They also need to be trained on how to scaffold CF and how scaffolding can help them to understand the developmental level of individual students, and therefore enable them to devise appropriate treatments based on their needs.

To ensure that the training solves the teachers' challenges in the EFL classroom, it needs to address the issue of time and suggest ways in which the teachers can devise manageable treatments during their classes. Training programmes need to ensure that the teachers do not view written CF and error treatment as a burden but, rather, as an essential complementary part of their classroom instruction and, indeed, of learning.

8.2.6 The EFM Teacher's Guidebook

There is a teachers' guidebook for each level in the Cycle Two Basic Education schools. It is divided into units, each of which includes a number of lessons. The teachers' guidebook is highly structured, as each lesson is explained in detail and the teachers are provided with step-by- step instructions on how to teach the lesson. In the first part of the guidebook, the teachers are provided with some general guidelines about how to teach the different skills and sub-skills and how to deal with certain pedagogical issues, such as group work. However, very limited guidelines about corrective feedback are provided. The guidebook mentions that teachers need to be selective in their written CF and encourage peer correction. These guidelines are too general, as they provide insufficient explanation of how to conduct peer work and when and how to be selective. Moreover, nothing is mentioned about the different strategies of written CF and the factors that might moderate the effectiveness of these strategies, nor about how teachers can incorporate individual differences in their EFL class with regard to written CF.

The teachers' guidebook is a very important source for EFL teachers in Oman, as they use it to prepare their daily lesson plans and refer to it whenever they need to learn more about a specific pedagogical practice, so it is useful to provide teachers with sufficient guidelines about various strategies of written CF and how to utilize these different strategies to help their students to develop their L2 knowledge. It should also be helpful to guide teachers on how to address individual differences in their written CF and explain how scaffolded CF might help them to understand their students' current developmental levels more clearly and, accordingly, design remedial tasks and treatments based on their individual students' needs.

8.3 Methodological contribution

8.3.1 The use of mixed methods (Quasi-experiment and TAPs)

This research employed methodological triangulation where both quantitative (quasi-experiment) and qualitative (TAP) were used to investigate written CF. Using a mixed methods approach, with a combination of quasi-experiment and TAP in a single study, could be regarded as a methodological contribution, as most of the published research to date has explored written CF using either a quasi-experiment or TAP but not both.

The use of mixed-methods in this research shows the complexity of learners' engagement with written CF. I think that the research needs to go beyond knowing whether written CF is

effective or not by measuring error decline on post-tests. The future written CF research needs to employ mixed-methods to gain a better understanding of the processes underpinning written CF, focusing on how learners engage with and process different types of written CF and why some of them fail to benefit from it.

8.3.2 The use of TAPs

Another methodological contribution is the use of TAP in this research. TAP helps us to understand how learners cognitively process written CF. In the previous research, the TAP was employed to understand the students' noticing and cognitive engagement and processing of written CF through the use of pair discussions. This research employed introspective TAP to understand individual students' cognitive processing of written CF and whether they repaired their errors with understanding. The retrospective TAP enriched the data and provided an understanding of why some students repeated their errors during revision. Retrospective TAP is also an effective method for understanding scaffolding between a knowledgeable other (the researcher) and a student. It helps to understand that scaffolding is likely to be successful if it pitched at the students' current developmental level, and students might be less likely to benefit from scaffolding if it is provided at a higher level than their current developmental level.

TAPs can be effectively used in other topics relevant to teaching and learning EFL/ESL. For example, it can be used to explore EFL learners' strategies when performing reading tasks. It can be utilised to understanding strategies used by learners in translation classes. It can be a very effective method in checking the appropriateness of tasks and questions when designing and evaluating EFL syllabuses and tests.

TAPs also can be applied to post lesson discussions as the teacher can be asked to produce retrospective verbal reports, reflecting on the thoughts and processes she implemented while planning and teaching the lesson. TAPs can be useful as well in lesson study where a group of collaborative teachers talk aloud their thoughts during planning and while reflecting on a lesson that had been taught/observed.

8.3.3 The Omani context

The methods used in this research can be regarded as a methodological contribution to the Omani context. Most of the research on Oman uses surveys and interviews to collect data on

the participants' perspectives and beliefs about an educational phenomenon. Using a quasi-experiment and TAP in this research is unique and might inspire researchers in Oman to employ innovative methods to explore the participants' skills, practices and cognitive processes when carrying out activities in different educational settings.

8.4 Theoretical contribution

The findings of this research help us to understand written CF from the skill acquisition theory perspective. It posits that two treatments of direct and indirect written CF regarding a newly-learned linguistic structure are insufficient to exert a long-term effect. The students might need to practice the linguistic structures and receive more episodes of written CF in order to acquire L2 knowledge.

A further contribution is to understand written CF from different theoretical perspectives. From a cognitive perspective, the TAP findings show that the lower proficiency level students found it difficult to notice gaps and cognitively process written CF. From a socio-cultural perspective, the lower proficiency level students in this study were unable to benefit from the scaffolding because it might have been provided at a higher level than their current developmental level. According to socio-cultural theory, scaffolding is successful when it is provided at the students' current developmental level.

8.5 Recommendations for future research

8.5.1 Larger sample size

One of the limitations of this study was the sample size employed for the quasi-experiment. The total number of participants was (n=58). Although, this sample size produced plausible results, a larger sample size is recommended. It is worth noting here that key research in the field of written CF has been carried out with similar sample sizes, but these do approach the minimum acceptable sample sizes for the statistical methods used. Larger samples would make the findings based on these statistics more persuasive. Hudson and Liosa (2015, p.91) point out that, if the sample size increases, the statistical estimates become more precise.

8.5.2 The effect of revision

Revision is an important practice in EFL/ ESL classroom, so it will be helpful to know if written CF has a revision effect and if improvement in revision predicts some learning effect in

new writing. Most studies found that written CF is effective for revision (e.g., Van Beuningen et al, 2008, 2012; Truscott and Hsu, 2008; Ferris and Roberts, 2001). However, studies came with contrasting results regarding whether improvement in revision predicts any learning effect in a new subsequent writing. For example, Van Beuningen et al. (2008, 2012) found that improvement in revision was sustained in the new subsequent writing, while Truscott and Hsu (2008) found that improvement in revision was not evident in the new subsequent writing.

In the current study, revision is part of the study design as the study aims to find out if written CF helps Omani EFL students to revise their initial writing task and whether improvement in revision predicts any learning effect in a new subsequent writing task. The study found that improvement in revision predicted some learning effects in the new writing task (immediate post-test) for the comparative but not for prepositions of space.

For future research, it would be interesting to establish if written CF on newly-learned linguistic structures improves the learners' grammatical accuracy regarding a new writing task if the students are not provided with the opportunity to revise their initial writing task. A fourth group could be added where the students are provided with written CF but not with the opportunity to revise their initial writing task. By doing this, we can discriminate between the revision effect of the same writing task and the written CF effect on new writing task. The findings from such research may provide some guidance regarding better practices when using written CF in the EFL/ESL classroom. That is, to understand whether written CF is more effective in new writing task when the students are provided with the opportunity to revise their initial writing task.

8.5.3 Further research on indirect CF

For future research, researchers may be need to establish whether indirect CF is superior to direct CF in new writing when targeting more than one linguistic structure. In the current study, written CF is highly focused, as only one linguistic structure was targeted in each task. It could be argued that indirect CF in this study was salient, as the students might find it easy to process.

8.5.4 Further research on the students' uptake

One of the important findings of the TAP employed in this research was that 35% of the direct group's repair during revision was without understanding. Zhao (2010, p. 5) points out that

written CF which is noticed but not understood might lead to revision but not necessarily contribute to the development of L2 learners' long-term writing proficiency. Examining the relationship between the type of noticing (e.g. noticing with understanding and noticing without understanding) and the learners' ability to use written CF in subsequent, new writing was beyond the scope of this research. However, in future research, it would be worth examining this issue to establish whether the quality-level of the noticing of written CF determines the learners' ability to use the linguistic structure accurately in new writing.

8.5.5 Longitudinal studies

Hudson and Liosa (2015, p. 92) comment that, in some studies, the amount of intervention time does not produce a salient treatment effect in a quasi-experiment setting. In this study, the students received two treatments of written CF: one on their pre-test and the other on their immediate post-test. If the students had received more than two treatments of written CF, the quasi-experiment might have shown some treatment effect in the long-term. For future research, it is recommended that a series of delayed post-tests may capture a clearer picture of the effectiveness of written CF over time (Bitchener and Storch, 2016).

8.5.6 Written CF research in the Omani context

When I started this research, I was keen to read the written CF studies that were conducted in a similar context: Basic Education Schools in Oman. Several studies (e.g. Al Harrasi, 2007; Al Faki and Siddiek, 2013) examined the teachers' use of feedback and the students' uptake of this in addressing their oral errors. The majority of other studies which addressed written CF (e.g. Al Ajmi, 2015; Al Bakri, 2015; Denman and Al Mahrooqi, 2013) were conducted in a college setting. Written CF research which is conducted in a school context in Oman is scarce. This is one of the challenges I faced in this research, as no written CF studies had been conducted in a similar context to inform my findings. However, the current study can be regarded as exploratory in nature, as it started with an agenda of examining written CF in Basic Education Schools in Oman. For future research, I recommend that more research is conducted following this agenda to understand how direct and indirect written CF facilitates L2 learning and what difficulties the students may face when processing these two strategies. Future research also may focus on examining alternative ways of providing written CF, such as direct written CF plus written-oral metalinguistic explanations and scaffolded CF, to determine whether or not these strategies are helpful in improving the grammatical accuracy of students.

Such research might help the teachers to understand the potential of the different strategies of written CF in the Omani EFL classroom.

8.6 The impact of the current study

One of the merits of the current study is that it employed mixed-methods to examine the topic of written CF. Quantitative method (quasi-experiment) provided data on whether different types of written CF (direct written CF and indirect written CF) were effective or not and effective under what conditions, while qualitative method (TAPs) provided data on why some written CF was not incorporated on students' subsequent writing and why some of them failed to benefit from it. I hope that the design of the current research will have an impact on future research in a way that it follows the same agenda of using mixed methods to examine written CF. Mixed-methods research will provide a better understanding of the topic of written CF rather than using a mono-method research.

The findings of the current study might have an impact on whether some types of linguistic structures are more teachable than others. For example, the findings of the current study show that the comparative is more teachable and amenable to error correction than prepositions of space. That is because the comparative is rule-governed, while prepositions of space is less rule-governed because of this there was some short-term learning effect in the use of the comparative but not in the use of prepositions of space in this study. This finding might help teachers to think of different strategies to treat different types of errors.

The current study revealed some interesting findings regarding written CF which might have an impact on how written CF is practiced inside the Omani EFL classroom. The study might provide some guidance for Omani teachers regarding better practices of written CF. Findings of the current study might also provide some insights for stakeholders in the MOE and MOHE to include written CF in the teachers' pre-service and in-service training programmes, and to provide some guidelines about written CF in the Teachers' Guide Books.

8.7 Final remarks

To conclude, working on this thesis helped me to gain a good knowledge of the topic of written CF. I developed a better understanding about the different strategies of written CF and the factors that may impact on the effectiveness of these strategies. As mentioned in Chapter

One of this thesis, the motivation for conducting this research was linked to questions arising from my own experience and observations when teaching English in Basic Education Schools, and I believe that the findings of this research provided detailed answers to my questions. Conducting mixed-methods research helped me to gain skills in collecting and analyzing both quantitative data (quasi-experiment) and qualitative data (TAP). I found training programs were helpful and helped me to analyze my data. I also benefited from presenting some papers at workshops and post-graduate conferences.

I hope that the findings of this research will be beneficial for teachers and help them to understand more clearly the direct and indirect CF strategies and the issues underpinning their effectiveness. I also hope that this research will inspire the stakeholders to consider including written CF as a component of future teacher training programs.

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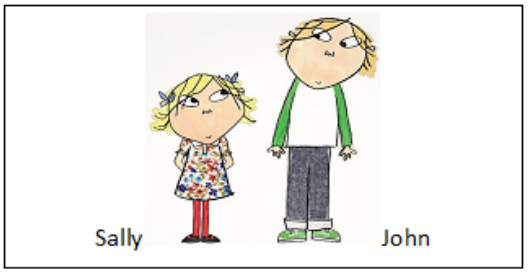
APPENDIXES:

Appendix A

Pre-test/ comparatives

Look at the pictures. Use the adjective given under each picture to write a comparative sentence.

Examples:

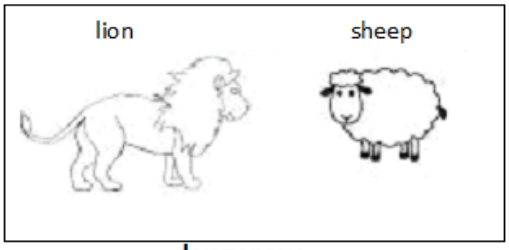


short

Sally is **shorter** than John.

beautiful

A queen is **more beautiful than** a witch.

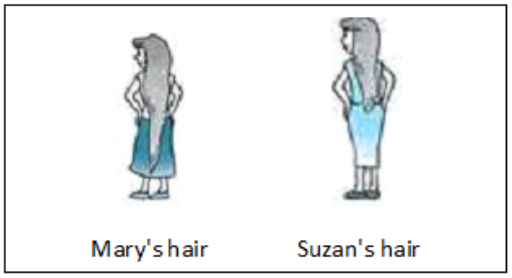


dangerous

1. A lion……
……

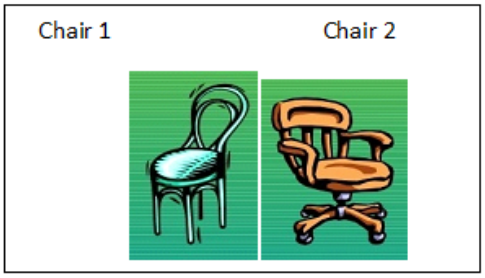
old

2. Mike ……
……



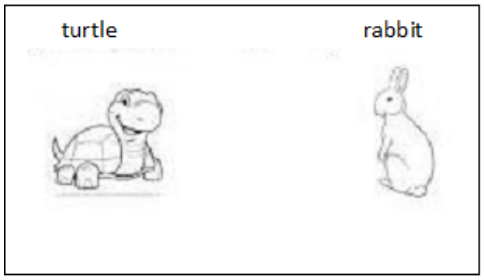
long

3. Mary's hair……
……

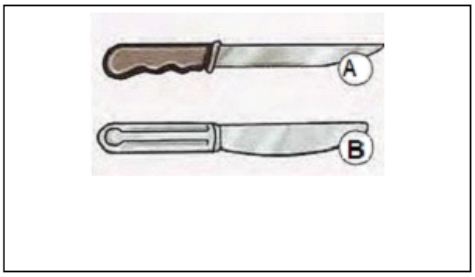


comfortable

4. Chair 1……
……



slow



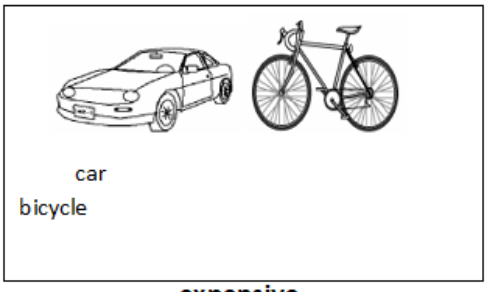
sharp

5. A turtle ……..

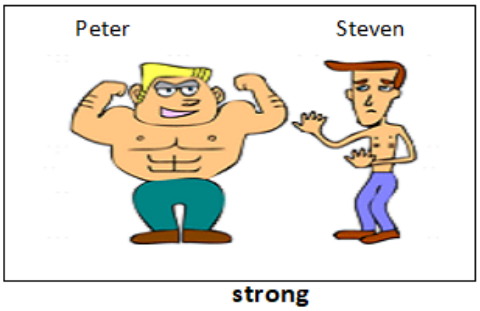
……..

6. Knife A……..

……..



expensive



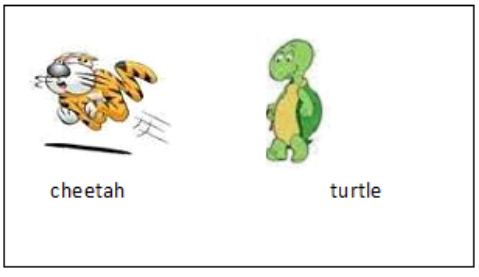
strong

7. A car……..

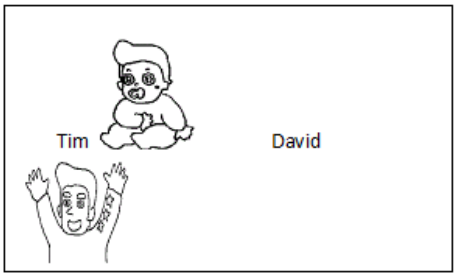
……..

8. Peter……..

……..



fast



small

9. A cheetah ……..

……..

10. Tim……..

……..

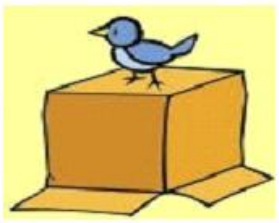
Appendix B

Pre-test/ prepositions

Look at the pictures. Use prepositions of place **(in, on, at)** to write sentences about the pictures. Write one sentence about each picture using the appropriate preposition.

Examples:

bird box



The bird is **on** the box.

cat box

The cat is **in** the box.

Mary work

1. Mary……
……

kite sky

2. A kite……
……

Jack Wall Street

3. Jack……
……

Sam car

4. Sam……
……

apple books

5. The apple ……

……

Nadine's family home

6. Nadine's family……..

……

Noora classroom

7. Noora……

……

Peter train

8. Peter……

……

Jack reception desk

9. Jack……

……

Raju elephant

10. Raju……

……

Appendix C

Proficiency Level Test

Name of student:

Class:

There are 70 multiple choice questions. Read the questions and circle the appropriate answer for each one. Choose one option for each question.

Example:

I <u>have</u> two brothers.

a. am

b. have

c. has

d. be

<u>Grammar</u>

1. _____s' your name? Nasser

a. How
b. Who
C. What
d. Where

2. I _____ from France.

a. is
b. are
c. am
d. be

3. How old are you?

a. No, I'm not
b. I'm 13
c. I'm a waiter
d. I 'm a pupil

4. Do you have brothers?

a. No, I not have
b. No, they don't

c. No, I don't
d. No, they not have

5. Where are they from?

a. There from Nizwa
b. They're from Nizwa
c. I'm from Nizwa
d. He is from Nizwa

6. This is my friend. _____ name is Rashid.

a. Her
b. Our
c. Yours
d. His

7. Mohammed is _____.

a. my brother's friend
b. friend my brother
c. friend from my brother
d. my brother friend's

8. My sister is_____ artist.

a. the
b. an
c. a
d. ----

9. _____ 20 desks in the classroom.

a. This is
b. There is
c. They are
d. There are

10. Nabeel _____ horror movies.

a. likes not
b. don't like
c. doesn't like
d. isn't likes

11. Sorry, I can't talk. I _____ right now.

a. driving
b. 'm driving
c. drives
d. drive

12. She _____at school last week.

a. didn't be
b. weren't
c. wasn't
d. isn't

13. I _____ the film last night.

a. like
b. likes
c. liking
d. liked

14. _____ a piece of cake? No, thank you.

a. Do you like
b. Would you like
c. Want you
d. Are you like

15. The living room is _____ than the bedroom.

a. more big
b. more bigger
c. biggest
d. bigger

16. The car is very old. We're going _____ a new car.

a. to buy
b. buying
c. to will buy
d. buy

17. Hoor is a vegetarian. She _____ meat.

a. sometimes eats
b. never eats
c. often eats
d. usually eats

18. There aren't _____ buses late in the evening.

a. some
b. any
c. no
d. a

19. The car park is _____ to the restaurant.

a. next
b. opposite
c. behind
d. in front

20. Shamsa _____ shopping every day.

a. is going
b. go
c. going
d. goes

21. They _____ in the park when it started to rain heavily.

a. walked
b. were walking
c. were walk
d. are walking

22. Do you work on Sundays?

a. Yes, I work
b. Yes, I do
c. Yes, I am
d. Yes, I was

23. This is Fatma and this is her brother, Ali. _____ my friends.

a. We're
b. I'm
c. You're
d. They're

24. _____? I'm from Oman.

a. Where are you from
b. Where you are from
c. Where from you are
d. From where you are

25. I'm from Dubai. _____ is in the United Arab Emirates.

a. They
b. It
c. He
d. She

26. Excuse me, how _____ your name? S-A-R-A-H

a. spell
b. you spell
c. do you spell
d. spell you

27. Oh, _____ are my keys!

a. This

b. These
c. That
d. It

28. I'd like _____ omelet, please.

a. a
b. ----
c. an
d. two

29. And here is your _____.

a. desk
b. desks
c. a desk
d. an desk

30. My name is Omar and this is Laila. _____ doctors from Egypt.

a. I'm
b. We're
c. She's
d. They're

31. Sorry, _____ Khalid. My name's Ahmed.

a. I isn't
b. I is not
c. I aren't
d. I'm not

32. _____? No, he isn't.

a. Are they teachers?
b. Are you from Bahrain?
c. Is Mr. Waleed a teacher?
d. Is this your phone?

33. _____is the school? It's 50 years old.

a. How many years
b. How much years
c. What years
d. How old

34. What is _____?

a. job Mary
b. Mary job
c. Mary's job
d. Job's Mary

35. Your bag is next _____the table.

a. on
b. to
c. in
d. of

36. _____ are the keys? On the table.

a. What
b. When
c. Where
d. Who

37. I go to work _____ train.

a. with
b. by
c. for
d. in

38. She _____ a car.

a. not have
b. don't have
c. don't has
d. doesn't have

39. Nasser _____ in our company.

a. work
b. works
c. is work
d. working

40. _____ they live in Muscat?

a. Are
b. Is
c. Do
d. Does

41. _____ to the cinema.

a. We not often go
b. We don't go often
c. We don't often go
d. often we don't go

42. When do you play tennis? _____ Mondays.

a. On
b. In
c. At

d. By

43. What time_____ work?

a. starts he
b. do he starts
c. does he starts
d. does he start

44. _____ two big shopping malls in the city.

a. It is
b. There is
c. There are
d. This is

45. There aren't _____ here.

a. a restaurants
b. any restaurants
c. any restaurant
d. a restaurant

46. I'm afraid it's _____.

a. a hotel expensive
b. expensive hotel
c. expensive a hotel
d. an expensive hotel

47. They _____popular TV programs in the 1980s.

a. are
b. were
c. was
d. is

48. _____ at school last week?

a. Do you were
b. Was you
c. Were you
d. You were

49. Are you Indian?

a. No, I am Omani.
b. No, my are Omani.
c. No, my is Omani.
d. No. I is Omani.

50. We _____the film last week.

a. see
b. saw
c. sees
d. were see

51. He _____ tennis with me yesterday.

a. doesn't played
b. didn't played
c. not played
d. didn't play

52. She was born _____ May 6th, 1992.

a. in
b. at
c. on
d. from

53. Where _____ last summer?

a. you went
b. did you went
c. do you went
d. did you go

54. Were you at the shops at 5 p.m yesterday? No, I _____.

a. didn't
b. am not
c. wasn't
d. weren't

55. Excuse me, _____is the T- shirt? It's OR 10.00.

a. what expensive
b. how much
c. how many
d. how price

56. She's only four but she _____.

a. can read
b. can reading
c. can reads
d. reading can

57. This party is boring. We _____ a good time.

a. don't have
b. aren't having
c. don't having
d. aren't have

58. Sorry, I _____you at the moment.

a. can't help
b. don't can help
c. can't helping
d. can't helps

59. I _____ my computer very often.

a. am not using
b. don't use
c. doesn't use
d. am not use

60. it's my sister's birthday next week. I _____ her a present.

a. buy
b. buys
c. am going to buy
d. buying

Vocabulary

61. Aysha is married to Salim. He's her _____.

a. uncle
b. husband
c. wife
d. parent

62. We usually _____ the shopping in a supermarket.

a. make
b. do
c. have
d. go

63. I love this watch! It's _____.

a. handsome
b. kind
c. beautiful
d. ugly

64. He doesn't have a car so he often uses public _____.

a. taxi
b. transport
c. car
d. bus

65. Qasim doesn't go to _____ on Sundays.

a. job
b. office
c. factory
d. work

66. I feel very _____. I 'm going to go to bed.

a. nap
b. asleep
c. sleepy
d. sleeper

67. Do you like Omani_____?

a. kitchen
b. meal
c. food
d. cook

68. I'm Khalid Al Bahri. Nice to _____you, Mr. Al Bahri.

a. speak
b. talk
c. meet
d. watch

69. Can I help you? Thanks, but I'm just _____.

a. watching
b. looking
c. seeing
d. shopping

70. Nisreen is over there. She's _____ a blue T-shirt and jeans.

a. having
b. wearing
c. doing
d. walking

The End

Appendix D

Proficiency level test scores for the three classes/ groups:

Group	Student No.	Proficiency level test score	%
Direct written CF group	1	31	44
	2	30	42.8
	3	29	41
	4	26	37
	5	25	35.7
	6	25	35.7
	7	23	32.8
	8	23	32.8
	9	22	31
	10	22	31
	11	22	31
	12	21	30
	13	20	28.5
	14	20	28.5
	15	18	25.7
	16	17	24
	17	17	24
	18	16	22.8
	19	16	22.8
	20	16	22.8
	21	16	22.8
	22	15	21
	23	14	20
	24	14	20
	25	12	17
	26	12	17
	27	8	11
Indirect written CF group	28	33	47
	29	28	40
	30	27	38.5
	31	27	38.5
	32	26	37
	33	25	35.7
	34	25	35.7
	35	24	34
	36	21	30
	37	21	30
	38	21	30
	39	20	28.5
	40	20	28.5
	41	20	28.5
	42	20	28.5
	43	19	27
	44	19	27

	45	19	27
	46	19	27
	47	18	25.7
	48	18	25.7
	49	18	25.7
	50	17	24
	51	17	24
	52	14	20
	53	13	18.5
Control group	54	32	45.7
	55	32	45.7
	56	30	42.8
	57	29	41
	58	25	35.7
	59	25	35.7
	60	25	35.7
	61	24	34
	62	24	34
	63	24	34
	64	23	32.8
	65	23	32.8
	66	21	30
	67	21	30
	68	21	30
	69	20	28.5
	70	20	28.5
	71	20	28.5
	72	19	27
	73	19	27
	74	17	24
	75	13	18.5
	76	13	18.5

Appendix E

Lesson plan

The comparative

Date	3rd of October 2016
Grade	Class 6/1- 6/2- 6/3
Focus	How to form comparatives ‘’er-than’’ and ‘’more-than’’
Learning outcomes	Students understand grammatical rules of comparatives. Students will be able to accurately produce comparative forms in speaking and writing.
Strategies	I use deductive way of teaching grammar. I introduce grammatical rules of comparatives first. I provide students with some examples. I provide them with some practice on comparatives.
Warm up	Start with eliciting adjectives from students. Elicit some sentences with ‘’er-than’’ as students might be familiar with these sentences as they use them in their class.

Steps	Researcher task	Student task
1	I elicit some adjectives from students.	Sts. say examples of adjectives.
2	I introduce adjectives of one syllable (short- tall-strong) I introduce adjectives of two or more than two syllables (beautiful, expensive, exciting) I use clapping hands for teaching adjectives of one or more than one syllable. I make students practice and differentiate between adjectives of one syllable and adjectives of two or more than two syllables.	
3	I introduce the grammatical rules of comparatives. (When we want to make a comparative sentence we need to add ‘’er-than’’ to adjectives of one syllable and add ‘’more-than’’ with adjectives of two or more than two syllables).	Sts. come up with examples of adjectives that have one syllable and adjectives that have two or more than two syllables. Sts. listen.
4	I elicit orally adjectives where there is a need to use ‘’er-than’’ or ‘’more-than’’ to form the comparative and say why?	
5	I elicit orally some comparative sentences where students use ‘’er-than’’ and ‘’more-than’’.	
6	I provide students with some practice on comparatives. I provide them with some adjectives (e.g. old-short-careful-famous-beautiful-cheap-delicious-weak) and ask them to produce sentences using the appropriate comparative form. After students finish writing the sentences, I elicit the sentences orally and write them on board.	Sts. say adjectives that need ‘er-than’’ or ‘’more-than’’ to form the comparative and say why. Sts. produce orally comparative sentences using ‘’er-than’’ and ‘’more-than’’. Sts. individually practice writing some sentences using the comparative forms.

Appendix F

Lesson Plan

Prepositions of space

Date	23rd October 2016
Grade	Class 6/1- 6/2 - 6/3
Focus	Introduce prepositions of space (in, on and at). Teach students when to use these prepositions
Learning outcomes	Students will be able to differentiate when to use prepositions of space (in, on, at). Students will be able to use prepositions of space (in, on and at) in sentences.
Strategies	I use a deductive technique of teaching grammar. I introduce grammatical rules of prepositions of space. I provide students with some practice on the use of these prepositions.
Warm up	I elicit sentences from students where they need to use (in, on and at). I locate objects in different places and ask students to try to give the location of the objects. For example: Where is the bag? ‘’The bag is on the desk’’ Although prepositions of space were not introduced formally yet, but I expect some students can produce such sentences because they encounter them in their course books (reading texts).

Steps	**Researcher task**	**Students task**
1	I locate objects in different places. I use questions, for example, ‘where is the pencil case?’’, ‘’where is the book?’’.	Sts. say sentences about the location of objects. For example, ‘’The pencil case in in the bag.’’, ‘’The book is on the table.’’.
2	I introduce the term ‘prepositions of space’. I explain that we use (in, on and at) to talk/write about location of people and objects.	Sts. listen.
3	I introduce the grammatical rules of prepositions of space (in, on and at). (‘in’ is used to describe someone/something in an enclose area, ‘on’ is used to describe someone/ something which is located on a surface and ‘at’ is used to describe someone who is doing a temporary activity in a specific place.) I explained grammatical rules in both Arabic and English due to the level of students in English.	Sts. listen.
4	I make students practice (in, on and at) by asking questions. For example: Where is Fatma’s scarf? Where is Amal’s ruler? Where is the rubbish basket? I ask them to justify their choice of prepositions. For example: ‘’Fatma’s scarf is in the bag, because the scarf is inside the bag’’. I allow students to justify their answers in Arabic because I expect it to be difficult for them to describe grammatical rules using English terminologies (e.g. enclosed, surface, temporary, specific) I provide more examples where we use prepositions of space (in, on and at). For example: (e.g. in a car, at work, on the donkey).	Sts. provide answers to the questions using the appropriate preposition. For example: Fatma’s scarf is in the bag. Amal’s ruler is on the desk. The rubbish basket is at the corner of the classroom.
5	I make students practice writing sentences using prepositions (in, on and at).	Sts. listen.
6	I elicited some of the sentences and write them on board.	Sts. write sentences using prepositions (in, on and at).

Appendix G

Coding accurate responses of students across tests (pre-test, revision, immediate post-test and delayed post-test)

Comparatives						
Treatment	Student No.	Proficiency test score	Tests			
			Pre-test	Revision	Immediate post-test	Delayed post-test
direct CF	1	31	4	5	5	8
direct CF	2	26	4	6	6	8
direct CF	3	25	8	7	6	7
direct CF	4	25	4	10	5	6
direct CF	5	22	5	7	4	4
direct CF	6	22	5	6	5	8
direct CF	7	22	6	9	5	8
direct CF	8	21	7	3	5	6
direct CF	9	20	4	6	5	6
direct CF	10	20	4	1	5	1
direct CF	11	17	5	6	3	7
direct CF	12	17	5	7	6	7
direct CF	13	16	7	9	7	6
direct CF	14	16	4	5	4	6
direct CF	15	16	5	5	5	4
direct CF	16	16	6	10	5	5
direct CF	17	15	4	9	6	6
direct CF	18	14	6	5	5	4
direct CF	19	14	5	7	5	5
direct CF	20	12	6	6	6	2
direct CF	21	8	5	5	6	3

Appendix H

The TAPs Practice

1. **Please read the task. Rewrite the sentences with the appropriate punctuation. Talk aloud while you do the task and write the sentences. Provide reasons and justifications for the changes you make in the sentence. Keep talking until you finish the task.**

   اقرأي النشاط التالي. اعيدي كتابة الجمل التالية مع استخدام علامات الترقيم المناسبة. تحدثي بسوط مسموع اثناء كتابة الجمل مع اعطاء تعليل للتغييرات التي اجريتيها عند كتابتك للجمل. استمري في التحدث بصوت مسموع حتى نهاية تأدية النشاط.

   A. ahmed was born in 1970 in Bahrain

   ……

   B. he works in a big company in Manama

   ……

   C. he speaks english very well

   .....

   D. his wifes name is fatma and his sons name is Rashid

   ……

   E. rashid studies engineering in usa

   ……

2. **Read the sentences. Complete the sentences using either simple present or present continuous. Talk aloud while you perform the task. Provide reasons and justifications for your choices. Keep talking until you finish the task.**

اقرأي الجمل الاتية. اكملي الجمل عن طريق اختيار الفعل المناسب للجملة من بين البدائل المعطاة امام كل جملة. تحدثي بصوت مسموع أثناء تأدية النشاط. خلال تأدية النشاط قومي بتعليل الاجابات التي اخترتيها. استمري في التحدث بصوت مسموع حتى نهاية تأدية النشاط.

A. Fatma is in the kitchen. She ……..…… dinner now. (cooks / is cooking)

B. She …… dinner every day. (cooks / is cooking)

C. They ……..…..…… football now. (play / are playing)

D. They ……..……. football every Saturday. (play / are playing)

E. Rahma …….…….**.....** me shopping every Friday. (does / is doing)

F. Sami …….…… at 6.00 o' clock in the morning. (gets up / getting up)

G. Ruqaiya ……..…..…… homework in her bedroom now. (does / is doing)

H. Nasser ……..…….. ice cream so much. (likes / is liking)

I. Giraffes ……..…… long necks. (have / are having)

J. Nisreen …….……. to school at 7.30 am. (goes / is going)

K. Ali ……..…….. stories every night. (reads / is reading)

L. He ……. a story about Sindbad now. (reads / is reading)

Appendix I

Instructions for doing TAPs

Think Aloud Protocols/ Revision (comparatives)

1.Read the task.

2.Look at the teachers' written corrective feedback in your task.

3.Re-write the sentences based on the teachers' written corrective feedback.

4.Talk while you do the task. Keep talking about each sentence and provide justifications for your answers based on the teachers' feedback. Talk about the comparative grammatical rules while you do the task.

١. إقراي النشاط.

٢. انظري الى تصحيح المعلمة للنشاط.

٣. أعيدي كتابة جميع الجمل بناءا على تصحيح المعلمة للنشاط.

٤. تحدثي بصوت مسموع اثناء قيامك بإعادة كتابة النشاط. استمري في التحدث حتى نهاية النشاط. تحدثي عن كل جملة في النشاط مع التركيز على القاعدة المتبعة في تنفيذ النشاط. أعطي تفسيرات حول الاجابات الصحيحة والإجابات الخاطئة مع الاستدلال بالقواعد النحوية المتعلقة باستخدام صيغ المقارنة.

Think Aloud Protocols/ Revision (preposition)

1.Read the task.

2.Look at the teachers' written corrective feedback in your task.

3.Re-write the sentences based on the teachers' written corrective feedback.

4.Talk while you do the task. Keep talking about each sentence and provide justifications for your answers based on the teachers' feedback. Talk about prepositions (in, on, at) grammatical rules while you do the task.

١. اقرأي النشاط.

٢. انظري الى تصحيح المعلمة للنشاط.

٣. أعيدي كتابة جميع الجمل بناءا على تصحيح المعلمة للنشاط.

٤. تحدثي بصوت مسموع اثناء قيامك بإعادة كتابة النشاط. استمري في التحدث حتى نهاية النشاط. تحدثي عن كل جملة في النشاط مع التركيز على القاعدة المتبعة في تنفيذ النشاط. أعطي تفسيرات حول الاجابات الصحيحة والاجابات الخاطئة مع الاستدلال بالقواعد النحوية المتعلقة باستخدام حروف الجر.

Appendix J

S5

Introspective TAP

Sent. 1

S5: "A lion is… is", what is this word teacher?
R: "dangerous"
S5: "dangerous…A lion is…dangerous."
R: What did you write?
S5: "A lion is more dangerous."
R: Why did you add 'more' here?
S5: Because it is "more dangerous".

Sent. 2

S5: Mike [translate the sentence in Arabic/ accurate]. "Mike is old."
R: And what about Sam?
S5: "Sam is small."
R: What to use here, what is the grammatical rule?
S: (silent)

Sent. 3

S5: "Mary's hair is long Suzan's hair."
R: Please keep talking while you do the task, say why you are writing the sentence that way.

Sent. 4

S5: "Chair 1 is comfortable chair 2.", the first chair has wheels but the second one doesn't, "Chair 1 is comfortable chair 2."

Sent. 5

S5: "A turtle is slow rabbit.'' [Student provides an accurate targeted sentence in Arabic]

Sent. 6

S5: "Knife A is sharp B." [Student provides an accurate targeted sentence in Arabic]

Sent. 7

S5: "A car is bicycle expensive." [Student provides an accurate targeted sentence in Arabic]

Sent. 8

S5: "Peter..Steven...Peter is strong." [Student provides an accurate targeted sentence in Arabic]

Sent. 9

S5: "A cheetah is fast turtle." [Student provides an accurate targeted sentence in Arabic]

Sent. 10

S5: "Tim is small David." [Student provides an accurate targeted sentence in Arabic]. Can we add a word here teacher?
R: What do you want to add?
S5: ''Tim is small and David is big.''
R: No you can't add "big" to the sentence. Use only the words given in the picture.
S5: "Tim is small David."

S5

Retrospective TAP

01 R: Have you finished?

02 S5: Yes, teacher.
03 R: Did you check errors? What about sentence 1?
04 S5: 'dangerous'?
05 R: Yes, read the sentence please.
06 S5: ''A lion is more dangerous.''

07 R: Why you added 'more' here?
08 S5: Because it is ''more dangerous''
09 R: Can you explain more?
10 S5: (silent)
11 R: Ok, what about other sentences?
12 S5: ''old''
13 R: Yes, what did you write?
14 S5: ''Mike is old.''
15 R: Do you need to make changes in the sentence?
16 S5: (silent)...''is'', I added ''is''
17 R: Why you added ''is''?
18 S5: Because singular.
19 R: What is singular?
20 S5: ''Mike''
21 R: Yes we add ''is'', but there is something else missing, have you read the examples?
22 S5: Yes.
23 R: Could you please read example number 1?
24 S5: ''Sally is shorter than John.''
25 R: So what is added in the adjective?
26 S5: ''is'', ''is short''
27 R: Not ''is'', look at the word ''short'', how it is used in the sentence? Any changes?
28 S5: ''shorter''
29 R: Yes, why ''shorter''?
30 S5: (silent)
31 R: Because the word ''short'' is one syllable, so we add ''er_than'' to make comparative, to compare Sally and John. So what to write for sentence 2?
32 S5: ''old''
33 R: Yes, what to add?
34 S5: ''er''?
35 R: Yes, we add ''er''. Good, what about other errors? "Chair A is comfortable chair 2", what is the error here?
36 S5: (silent)
37 R: How to compare the two chairs? What is the difference between the chairs?
38 S5: Chair A has wheels, but chair B does not have wheels.
39 R: Look at the word 'comfortable'. What do we need to add?
40 S5: ''is'', we add ''is''?
41 R: Yes we add is, but what to add to the word ''comfortable'', look at the word ''comfortable''?
42 S5: (silent)
43 R: How to pronounce the word ''comfortable''? Say it?
44 S5: ''comfortable''
45 R: Make it into syllables. Read it slowly?
46 S5: ''Comf..fo..comfo, table''
47 R: ''com... fort... table'', how many syllables?
48 S5: Two.
49 R: No, ''com... fort... table'' , how many?
50 S5: Three.
51 R: Yes, three, so what to add?
52 S5 ''er''?
53 R: No.
54 S5: ''is''?

55 R: No, no, we add ‘’more than’’ , we add ‘’more than’’ to words of two or more than two syllables. So what to say for sentence 4?
56 S5: Chair 1 is more comfortable than chair two.
57 R: What about sentence 3? Read it please.
58 S5: ‘’'Mary's hair is long Suzan's hair'.’’
59 R: What is missing here?
60 S5: (silent)
61 R: How many syllables?
62 S5: One, ‘’er’’, ‘’Mary's hair is longer Suzans' hair.’’
63 R: Yes, ‘’longer than Suzan's hair’’. Look at other sentences? What about number 6? Read it please.
64 S5: A car is expensive a bicycle.
65 R: Ok, so what is the correct sentence?
66 S5: ‘’A car is expensiver than bicycle’’.
67 R: No, no, why ‘’expensiver’’?
68 S5: Because (silent) because three syllables?
69 R: Ok, if it is three syllables what to add?
70 S5: (silent) ‘’more than’’?
71 R: Yes, we add ‘’more than’’
72 R: What about sentence eight? Is there anything wrong?
73 S5: ‘’Peter is strong Steven’’
74 R: What is wrong?
75 S5: ‘’Peter is more strong than Steven’’
76 R: Why you added ‘’more’’ here?
77 S5: Because (silent), because one syllable.
78 R: What is one syllable?
79 S5: ‘’strong’’
80 R: And if it is one syllable, what to add?
81 S5: ‘’more’’
82 R: No, you are mixing rules.
83 S5: ‘’more stronger than peter’’
84 R: No, no, we cannot say ‘’more stronger’’. We say ‘’Peter is stronger than Steven’’. We cannot add ‘’er’’ and ‘’more’’ in the same sentence. We add ‘’er_ than’’ for sentences that have one syllable and ‘’more_ than’’ for sentences that have two or more sentences. Look here, ‘’long- longer than’’, ‘’old- older than’’, ‘’strong- stronger than’’, these words have one syllable, so we added ‘’er’’, Ok.
85 S5: Yes.
86 R: Look at your first task here. I did the corrections for you. Did you benefit from the corrections?
87 S5: The teacher corrected the wrong words for me.
88 R: Yes, was that useful? Look here. You wrote ‘Mike is old Sam’ in your first draft. The teacher corrected that and wrote “Mike is older than Sam. A lion is more dangerous than sheep”. Why did you repeat the same errors during the revision?
89 S5: Maybe I need more time to go through the corrections.
90 R: Was the time insufficient to revise the task?
91 S5: It is confusing teacher.
92 R: What is confusing?
93 S5: The errors.
94 R: Aha, and what is about the grammatical rule? Did you use the grammatical rule when you completed the task?
95 S5: What do you mean?
96 R: We have grammatical rules in English, so when we talk and write we use those grammatical rules. In this task, we want to make a comparison between people and things, OK?
97 S5: Yes.

Transcription Key

Key	Use
S5:	Student number
R:	Researcher
Sent. 1 Sent. 2	A number is given to each sentence produced by the student during the introspective TAP.
01 02 03	A numeric is given to each intervention in the retrospective TAP made by a student or researcher.
“ ”	Quotation marks are used for: a word, phrase or sentence produced/ uttered by a student or researcher in English.
[Student provides an accurate, targeted sentence in Arabic]	If a student provides an accurate, targeted sentence in Arabic, it is enclosed between brackets.
…	Used to indicate a short pause.
(silent) (read examples given in the task)	Brackets are used to indicate that a student pauses for a while, and so that the student is reading the examples given in the task.
{fouq} {dakhil}	Arabic translation of terms, for example translation for preposition “on” {fouq} and “in” {dakhil}

Appendix K

إفادة موافقة

الفاضلة/ ..... المحترمة

أفيدكم علما باني/ شريفة بنت ناصر بن محمد الحراصية، طالبة دكتوراة بجامعة ستيرلنج بالمملكة المتحدة، وموضوع بحثي هو (تأثير الطريقة المباشرة والطريقة الغير مباشرة لتصويب الأخطاء الكتابية على مستوى أداء الطلاب العمانيين بمدارس الحلقة الثانية في مادة اللغة الانجليزية)

أنا بصدد جمع بيانات الدراسة باستخدام أداتين (الطريقة التجريبية - الطريقة اللفظية)، لذلك فهناك حاجة إلى عينة مكونه من ٣ صفوف (الصف السادس الأساسي) لإجراء التطبيق.

كما أفيدكم علما بان البيانات المستخلصة من الدراسة من الممكن استخدامها لأغراض البحث والنشر العلمي مع الأخذ بعين الاعتبار عدم ذكر أسماء المدارس والأشخاص المشاركين في الدراسة. أتمنى آن تخرج الدراسة بنتائج قيمة وذو فائدة لمعلمي ومعلمات اللغة الانجليزية بمدارس الحلقة الثانية في عمان.

سوف أقوم بإعطاء شرح مفصل لكلا من (المعلمة الأولى-معلمة الصف-طالبات الصف) عن الأدوار والمهام المطلوبة منهن كما سوف اطلب إفادة موافقة من جميع الفئات المشاركة وكذلك ارسال افادة موافقة لأولياء امور الطالبات حيث يحق لأي ولي أمر رفض مشاركة ابنته في الدراسة. كما يحق للمشاركات الانسحاب من الدراسة في أي وقت في حالة عدم الارتياح للإجراءات المتبعة.

اقدر كثيرا تعاونكم معي في تطبيق الدراسة وسوف أكون شاكرة وممتنة لتسهيل مهمتي كباحثة في مدرستكم.

مع خالص شكري وتقديري،،،

الاسم: شريفة بنت ناصر بن محمد الحراصي

الهاتف: ٩٨٠٤٨٠٧٠

الايميل: s.n.alharrasi@stir.ac.uk

أوافق ومستعدة على التعاون:

الاسم: التوقيع: التاريخ:

لا أوافق وغير مستعدة على التعاون:

الاسم: التوقيع: التاريخ:

Appendix L

Consent Form

To: Senior English Teacher

I am Sharifa Nasser Mohammed Al Harrasi, a PhD student at University of Stirling- Scotland-UK. My study is sponsored by Ministry of High Education in Oman. The study is titled (The effect of Direct and Indirect Written Corrective Feedback on Omani EFL Students' Grammatical Accuracy at Cycle Two Basic Education Schools). The aim of the study is to examine the effectiveness of the direct and indirect written CF strategies used by English teachers in Oman.

I am using two data collection methods; quasi-experiment of pre-test, immediate post-test and delayed post -test and think aloud protocols. In the quasi-experiment students will be asked to do some writing tasks (4 tasks on comparatives and 4 tasks on prepositions of space) in the class. Some students will be selected from each class (6 students) to produce verbal reports while doing the tasks. They will be audio recorded for the purpose of the research. In order to do so, I need to gain access to your school. I need 3 grade six classes from whom to collect data.

The data collected might be used for publication purposes in the future. I will be very careful about anonymity so no names of schools or people taking part will be mentioned in the study.

I will explain roles of different participants in the study (SET-class teacher-students). Information will be sent to parents so that they can decide to withdraw their children from the study if they wish. All participants will be free to withdraw at any point if they feel uncomfortable.

I hope that this study will be of benefit in future to teachers working in Omani schools. I would be grateful if you could support me in gaining access to grade six classes to do my study.

Many thanks

Researcher: Sharifa Al Harrasi
PhD student at University of Stirling-UK
Mobile: 00968 98048070
Email address: s.n.alharrasi@stir.ac.uk

I agree and I am happy to cooperate:

Name: **Signature:** **Date:I do not agree and I am not happy to cooperate:**

Name: **Signature:** **Date:**

Appendix M

Consent Form

To: Class Teacher

I am Sharifa Nasser Mohammed Al Harrasi, a PhD student at University of Stirling- Scotland-UK. My study is sponsored by Ministry of High Education in Oman. The study is titled (The effect of Direct and Indirect Written Corrective Feedback on Omani EFL Students' Grammatical Accuracy at Cycle Two Basic Education Schools). The aim of the study is to examine the effectiveness of the direct and indirect written CF strategies used by English teachers in Oman.

I am using two data collection methods; quasi-experiment of pre-test, immediate post-test and delayed post -test and think aloud protocols. In the quasi-experiment students will be asked to do some writing tasks (4 tasks on comparatives and 4 tasks on prepositions of space) in the class. Some students will be selected from each class (6 students) to produce verbal reports while doing the tasks. They will be audio recorded for the purpose of the research. In order to do so, I need to gain access to your school. I need 3 grade six classes from whom to collect data.

The data collected might be used for publication purposes in the future. I will be very careful about anonymity so no names of schools or people taking part will be mentioned in the study.

I will explain roles of different participants in the study (SET-class teacher-students). Information will be sent to parents so that they can decide to withdraw their children from the study if they wish. All participants will be free to withdraw at any point if they feel uncomfortable.

I hope that this study will be of benefit in future to teachers working in Omani Basic Education Schools. I would be grateful if you could support me in gaining access to grade six classes to do my study.

Many thanks

Researcher: Sharifa Al Harrasi
PhD student at University of Stirling-UK
Mobile: 00968 98048070
Email address: s.n.alharrasi@stir.ac.uk

I agree and I am happy to cooperate:

Name: **Signature:** **Date:**

I do not agree and I am not happy to cooperate:

Name: **Signature:** **Date:**

Appendix N

إفادة موافقة

عزيزي ولي أمر
الطالبة/.....

نرجو إفادتكم الكريمة حول موافقة مشاركة ابنتكم المذكورة أعلاه والمقيدة بالصف السادس الابتدائي في دراسة تقوم بها احد الباحثات التربويات بوزارة التربية والتعليم حول استراتيجيات تصويب الأخطاء الكتابية لطلاب الحلقة الثانية وأثرها على مستوى أداء الطلاب، حيث تشارك الطالبات بتنفيذ بعض الأنشطة الصفية وسوف يتم تسجيل بعض الطالبات اثناء تأدية النشاط. علما بان الطالبة لديها حق رفض المشاركة في الدراسة أو الانسحاب من المشاركة في الدراسة في حالة الشعور بعدم الرغبة في الاستمرار.

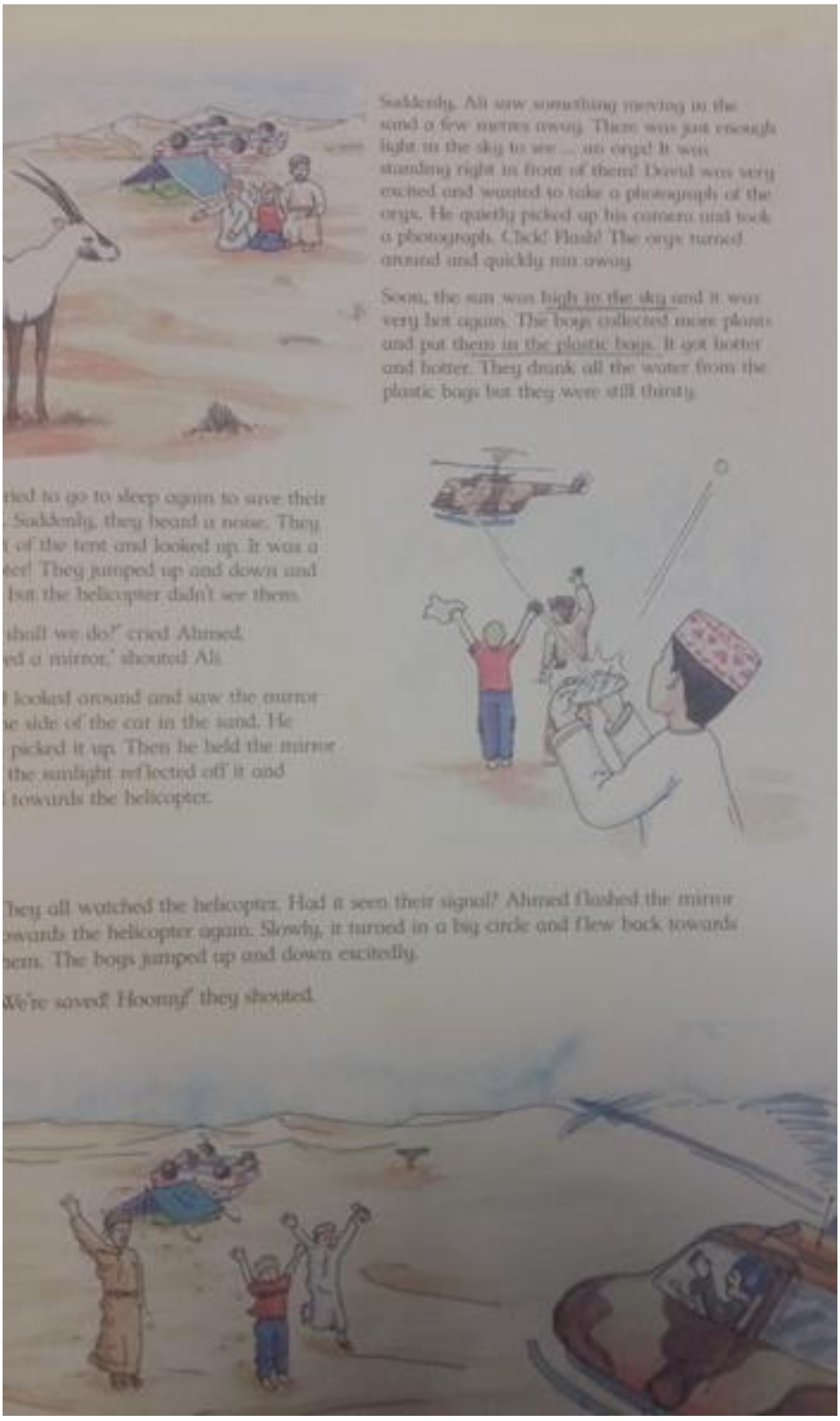
نرجو التكرم بالموافقة شاكرين ومقدرين تعاونكم معنا،،،

اسم الباحثة: شريفة بنت ناصر بن محمد الحراصية
رقم الهاتف الحمول: ٩٨٠٤٨٠٧٠
الايميل: s.n.alharrasi@stir.ac.uk

أوافق مشاركة ابنتي في الدراسة ☐ **لا أوافق مشاركة ابنتي في الدراسة** ☐

Appendix O

Some instances of prepositions of space in grade six course book:



Suddenly, Ali saw something moving in the sand a few metres away. There was just enough light in the sky to see ... an oryx! It was standing right in front of them! David was very excited and wanted to take a photograph of the oryx. He quietly picked up his camera and took a photograph. Click! Flash! The oryx turned around and quickly ran away.

Soon, the sun was high in the sky and it was very hot again. The boys collected more plants and put them in the plastic bags. It got hotter and hotter. They drank all the water from the plastic bags but they were still thirsty.

tied to go to sleep again to save their . Suddenly, they heard a noise. They of the tent and looked up. It was a ter! They jumped up and down and but the helicopter didn't see them.

shall we do?' cried Ahmed.
ed a mirror,' shouted Ali.

looked around and saw the mirror e side of the car in the sand. He picked it up. Then he held the mirror the sunlight reflected off it and towards the helicopter.

They all watched the helicopter. Had it seen their signal? Ahmed flashed the mirror towards the helicopter again. Slowly, it turned in a big circle and flew back towards them. The boys jumped up and down excitedly.

'We're saved! Hooray!' they shouted.

3 Make semaphore flags.

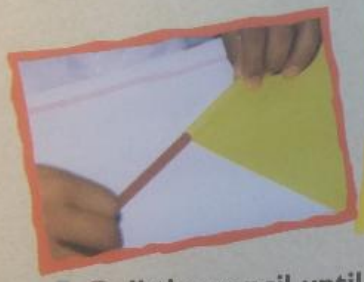
Remove cut-out page D from page 69 at the back
the instructions below and make two semaphore fl

1. Cut the page in half along the dotted line.

2. Put glue on the flag.

3. Put the pencil on the flag.

4. R a



5. Roll the pencil until you reach the line.

6. Make a red flag and a yellow flag.

Appendix P

How percentages in the analysis were counted:

- Errors committed by the direct group (27 ÷ 6 students × 10 obligatory use of targeted linguistic structure × 100% = 45%)
- Total repair of the direct group (2 total repair ÷ 27 total errors in pre-test × 100% = 7%)
- Repair with understanding of the direct group (0 repair with understanding ÷ 2 total repair × 100% = 0%)
- Repair without understanding of the direct group (2 repair without understanding ÷ 2 total repair × 100% = 100%)
- Total needs repair of the direct group (30 total needs repair ÷ 6 students × 10 obligatory use of targeted linguistic structure × 100% = 50%)
- Same error of the direct group (22 same error ÷ 30 total needs repair error × 100% = 73%)
- Different error of direct group (3 different error ÷ 30 total needs repair error × 100% = 10%)
- New error emerged of direct group (5 new error emerged ÷ 30 total needs repair error × 100% = 17%