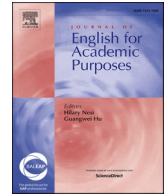




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Journal of English for Academic Purposes

journal homepage: www.elsevier.com/locate/jeap

The development of ESL students' synthesis writing through reading instruction

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ARTICLE INFO

Keywords:

Synthesis writing

ESL

L2 writing

L2 reading

Instruction

Integrated reading-to-write tasks

ABSTRACT

Synthesis writing, or discourse synthesis, is important in university contexts and has received increasing attention in research on academic writing. Synthesis is challenging because it involves using both reading and writing skills to integrate information from source texts. Although previous research has found that writing instruction leads to improvement in synthesis writing, no studies have investigated the effect of reading instruction. The current study investigates the effect of reading instruction on synthesis writing among learners of English as a second language. Participants were students in two in-tact high-intermediate writing classes in an intensive English program at a US university. Participants were assigned to either an experimental group or a control group. Both received the same synthesis writing instruction. The control group received standard reading instruction focusing on comprehending individual texts, while the experimental group received reading instruction focusing on making connections between the texts. Quantitative results indicated that the two groups improved similarly; however, qualitative results using the Appraisal framework from Systemic Functional Linguistics found that the experimental group more explicitly acknowledged information from the source texts, connected the two source texts with each other, and connected ideas from the source texts with the student author's own position.

1. Introduction

In academic contexts, reading and effectively writing from sources are important components of writing tasks in both first and second languages (Esmaeeli, 2002; Hirvela, 2016; Plakans & Gebril, 2009; Spivey, 1990). One prevalent type of integrated reading-writing task in academic settings which has received attention in the past decades is synthesis. Synthesis writing (also called discourse synthesis) is a writing task that involves both reading and writing (Segev-Miller, 2007); more specifically, it involves integration of information from multiple sources in order to generate a broader understanding of a topic (Zhang, 2013; Zhao & Hirvela, 2015). Synthesis writing involves not only reading and writing, but also critical thinking skills and the ability to integrate content information in order to create new insights (Zhang, 2013). Synthesis writing is prevalent in academic contexts both as a pedagogical genre of its own as well as a component of other genres, such as literature reviews (Segev-Miller, 2007). The important role of synthesis in academic settings and its connection to academic achievement have been investigated extensively (e.g., Numrich & Kennedy, 2017; Zhang, 2013).

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<https://doi.org/10.1016/j.jeap.2023.101274>

Received 31 October 2021; Received in revised form 29 June 2023; Accepted 7 July 2023

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Because synthesis requires not only selection and integration of content from sources, but also representation of new information, it has been found to be challenging for learners. On one hand, the task of synthesis writing is difficult for students because it involves both reading and writing skills for integration of information from multiple sources (Doolan, 2021; Hirvela, 2016; McGinley, 1992; Zhang, 2013). On the other hand, academic programs rarely include guided and systematic instruction to successfully scaffold students' synthesis writing (Cumming, Lai, & Cho, 2016; Plakans, 2009; Zhang, 2013). In particular, L2 learners may experience more difficulties in certain stages of synthesizing such as reading comprehension of sources or creation of new information (Numrich & Kennedy, 2017). These difficulties create greater need for support of students so that they can be successful in university contexts.

Previous research on synthesis writing among L2 learners has tended to focus largely on writing in assessment contexts, such as the integrated writing tasks on the TOEFL (e.g., Crusan, Plakans, & Gebril, 2016; Gebril & Plakans & Gebril, 2017; Plakans, 2008; Weigle & Parker, 2012). Much less research has focused on the role of classroom instruction in L2 learners' development of synthesis writing abilities. The small amount of research in this area has focused on the role of writing instruction (e.g., Zhang, 2013) and has shown such instruction to be effective in improving students' synthesis abilities. However, synthesis writing is heavily dependent on both reading and writing skills, and research has suggested that it is aided by the use of reading strategies (Zhao & Hirvela, 2015) and that it may be more strongly associated with reading comprehension abilities than writing abilities (e.g., Ascención Ascención Delaney, 2008). Thus, instruction targeting reading strategies may have a positive effect on learners' synthesis writing. However, to date, no research has examined such instruction.

Thus, to increase our understanding of how reading instruction can contribute to synthesis writing, the present study aimed to specifically investigate the role of classroom reading instruction on the improvement of ESL students' synthesis writing.

1.1. Literature review

In university contexts, writers are often required to read several source texts to gain knowledge and respond to readings in reading-to-write tasks. Though connections between reading and writing have been examined to a greater extent in L1 contexts, it has become an increasingly studied topic in L2 contexts as well.

Because reading-to-write tasks require both reading and writing skills, much research has focused on the role of each of these component skills and the pedagogical interactions between them. A large body of research has shown that the role of reading (i.e., reading comprehension) is positively associated with reading-to-write tasks like synthesis writing (Carrell & Connor, 1991; Hirvela, 2016; Plakans, 2009; Zhao & Hirvela, 2015). For instance, Plakans and Gebril (2017) found that reading comprehension and mining strategies play a vital role in both the process and product of integrated reading-to-write tasks and suggested that such reading strategies should be incorporated in academic writing courses.

Most of the studies that have investigated reading-to-write tasks have focused on the challenges that students have in learning to do reading-to-write tasks for academic purposes and assessment of students' attitudes toward those tasks (Cumming et al., 2016; Plakans & Gebril, 2017, 2009b; Zhao & Hirvela, 2015). For instance, Zhao and Hirvela (2015) conducted a qualitative study of two undergraduate Chinese ESL students' understanding of synthesis writing and how they comprehended the connectivity between reading strategies and synthesis writing. Using think-alouds and semi-structured interviews, Zhao and Hirvela found that students' task representation, in particular their understanding of the purpose of synthesis and their ability to relate it to other types of writing they were familiar with, strongly affected their synthesis writing abilities. In other studies, researchers have investigated the process of making reading-writing connections in L1 writing (e.g., Shanahan & Lomax, 1986; Spivey 1990) and L2 writing (Ascension, 2004; Johns & Mayes, 1990; Segev-Miller, 2004). Most of these studies have confirmed that although writing from sources is cognitively complex, certain practices and strategies can help students be successful. Many factors such as limited English language proficiency, low reading comprehension, and unfamiliarity with the development of academic writing have been identified as serious barriers to synthesis writing (Plakans, 2008).

1.2. The role of reading in reading-to-write

Over the past twenty years, research on the role of reading in integrated reading-to-write tasks has developed, delving into issues of reading comprehension, task complexity, and the writing processes in composing. In their systematic review of research on writing from sources, Cumming et al. (2016) found that certain characteristics of the source texts themselves may affect students' reading of the texts and thus make them more or less amenable to synthesis, such as text density, schematic organization, text length, readability, intertextual references, and students' interest in the topic. In Plakans and Gebril's (2012, 2013) studies, they found that students with higher reading proficiency had greater success in integrated writing from sources owing to the fact that they were able to employ more successful strategies for reading comprehension and integration of sources for completing the task. Similarly, Cho and Brutt-Griffler (2015) found that intermediate and advanced proficiency learners of English outperformed lower proficiency students on reading-to-writing tasks due to their higher ability in reading comprehension. This strong relationship is in line with previous research in which higher reading proficiency was found to have a significant role in different processes of writing such as making sense of source texts and creating new information (e.g., Plakans, 2009). Cho and Brutt-Griffler's analysis of the think-aloud protocols of 12 ESL students in one independent writing task and one synthesis writing task suggested that integrated tasks such as synthesis writing require effective use of reading strategies for success in the composing process. In terms of number of strategies, higher-scoring writers implemented more reading strategies such as goal-setting, metacognitive, and mining strategies than the lower-scoring writers. Zhao and Hirvela's (2015) case study of two Chinese ESL students also suggested the importance of reading strategies in synthesis writing, particularly rhetorical reading strategies that relate to key rhetorical moves in synthesis such as extending the ideas of sources,

countering sources, and connecting ideas across sources. Similarly, [Esmaeili \(2002\)](#), after closely analyzing 34 engineering students' essays, suggested that reading plays a fundamental role for writers and that ESL students perform higher when source texts and integrated tasks are thematically and directionally connected to each other. A common finding in both [Esmaeili \(2002\)](#) and [Plakans, 2009](#) was that reading ability resulted in more success in integrated reading-to-write tasks.

However, some other studies have found contradictory evidence regarding the relationship between reading ability and reading-to-write performance. For example, Ascención [Ascención Delaney \(2008\)](#) found that reading comprehension had only a modest relationship with performance on reading-to-write tasks such as summaries and response essays. Likewise, [Watanabe \(2001\)](#) and [Messer \(1997\)](#) concluded that independent reading scores and scores on a reading-to-write task had little in common. The conflicts about the factors affecting reading-to-write performance and the relationship between reading and integrated writing tasks highlight the need for additional research in this area.

1.3. Effects of instruction on synthesis writing

While researchers have found a close relationship between reading and writing skills, it is still not clear how instruction in one skill could benefit the other or performance on reading-to-write tasks ([Grabe & Zhang, 2013](#)). Building on the theory of constructive learning proposed by [Spivey \(1990, 1997\)](#), [Zhang \(2013\)](#) emphasized the role of instructional activities in the composing process of synthesis writing, focusing on three components: organizing information, selecting important information from sources, and connecting different information in meaningful ways. [Zhang \(2013\)](#) conducted a one-semester intervention study with 29 ESL students from an intensive English program. Participants were assigned to either an experimental group ($n = 14$) or a control group ($n = 15$). Both were exposed to similar amounts of reading, writing, and vocabulary instruction based on the standard course curriculum from two textbooks. The control group completed separate reading and writing practice. Conversely, the experimental group received five sets of discourse synthesis writing instruction additional to the textbooks. Pre-test and post-test problem-solution essays were scored quantitatively using the rubric from [Plakans, 2009](#). Results indicated that the group who received synthesis writing instruction performed significantly better than the control group. Aside from demonstrating the positive impact of instruction, this study showed the importance of supporting students in completing challenging tasks like synthesis writing through scaffolding in classroom instruction and curricula. This study provides strong evidence for the effect of classroom instruction on synthesis writing.

Another study on instruction and L2 synthesis writing provided a detailed and guided lesson for L2 graduate students in the social sciences ([Numrich & Kennedy, 2017](#)). Numrich and Kennedy created a five-phase sequence of instruction which was used by 10 graduate-level students. The instructional phases consisted of an introduction to discourse synthesis, preparing to write a synthesis paper, organizing and writing the synthesis paper, reviewing relevant language for a synthesis paper, and preparing a second draft. Example texts and results of a survey suggested an overall positive effect of instructional intervention on synthesis. Additionally, [Numrich and Kennedy \(2017\)](#) suggested that classroom instruction and guidance can lead to a positive learning outcome for synthesis writing in a creative and organized way. Although this study provided insight into teaching practices for synthesis writing, it was not experimental in nature, making the effects of instruction somewhat unclear.

In their systematic review of source-based writing for academic purposes, [Cumming et al. \(2016\)](#) found that previous research has suggested that "instruction can help students improve their use of sources in their writing" (p.52). In particular, [Cumming et al. \(2016\)](#) identified two approaches that have been found to be pedagogically successful: prompting students to analyze sources and helping students evaluate the value and reliability of sources through interactive questioning or annotations on the sources. Although few of the studies included in Cumming et al.'s review focused specifically on discourse synthesis writing, this nonetheless suggests that instruction focusing on students' analysis, evaluation, and understanding of source texts may benefit their discourse synthesis writing.

Although the previous research has contributed to our understanding of the role of both reading and writing skills in reading-to-write tasks as well as how L2 writing instructional practices can contribute to performance on synthesis writing tasks, we are left without a clear understanding of the possible effects of L2 reading instruction on synthesis writing. Extending the previous studies, the current study used mixed methods to examine whether, and how, students' synthesis writing was enhanced after L2 reading instruction by addressing the following research questions: 1) Does the quality of ESL students' synthesis writing improve after L2 reading instruction? 2) What are the differences in how ESL students synthesize source texts in their writing as a result of L2 reading instruction?

2. Methods

2.1. Participants

Twenty-eight participants were recruited from an intensive English program at a large Midwestern U.S. university. They came from diverse L1 backgrounds; however, the majority of the students had Chinese or Arabic as their L1. Their ages ranged from 18 to 30. All ESL students in the program had previous formal English instruction including reading, writing, listening, speaking, and grammar, through various levels. Participants had been randomly placed into two in-tact sections of a high-intermediate writing course. Both classes used the same textbook and materials until the treatment. Due to participant attrition and incomplete data from some participants, the final sample consisted of 24 participants (13 in the experimental group and 11 in the control group).

2.2. Procedure

Participants were involved in the data collection and treatment for one week (the fourth week of a seven-week term). Before and

after the reading treatment, tests were administered to both classes. The pre-test contained two reading sources and one prompt (adopted from Zhang, 2013). The texts and prompt were about culture shock and the life of international students in the U.S. These were thought to be appropriate because they are relatable and interesting for ESL students and at an appropriate level. Students were asked to synthesize the texts by linking the source texts to each other and their own opinion. They were allowed to use the whole time of the class, which was 50 min.

In the week of treatment, during the 50 min of three sessions of classes, students were exposed to 30 min of reading instruction and 20 min of writing instruction each day. Both classes received the same synthesis writing instruction, including samples of synthesis and response essays. Although both synthesis and response are reading-to-write tasks, synthesis involves integration of information across source texts while response more overtly draws on the writers' own opinion. In both classes, participants were guided to see the differences between the essay types by identifying citations, the difference between text structures as well as language, and connections of paragraphs. The samples were not based on readings for the class.

The difference between the two groups was in reading instruction. Participants of both groups were given the same two reading texts. Each of the texts was one to two pages long (around 460 words each). The control group received standard reading instruction focusing on comprehending reading texts individually. However, the experimental group received reading instruction based on Spivey's (1990) model of discourse synthesis, which includes three stages: organizing, selecting, and connecting. The instruction included practice organizing students' understanding of the texts by identifying main ideas and supporting details, selecting important information from the content of the source texts, and making connections between the texts by finding similarities and differences between the authors' ideas. As part of the 'connecting' step, students were also encouraged to have small group discussions about the difference between authors' ideas in the reading texts and their own opinion. They were not assigned homework and students were required to work on the reading texts in class.

Subsequently, the post-test was used in both classes to elicit further information about the effectiveness of reading instruction on synthesis writing. The participants of both groups were asked to work on the same essay prompt and source texts as they used for the pre-test for the same amount of time.

2.3. Quantitative analysis

The control and experimental groups' pre-test and post-test essays were transcribed exactly as they were written by the participants. To avoid researcher bias and maintain objectivity, two raters with experience teaching academic writing were selected to score the essays based on a five-point holistic scoring rubric (adopted from Plakans, 2009). Raters were provided with participating students' pre- and post-test essays and the two source texts, and they scored the essays individually with the help of the holistic scoring rubric. The interrater reliability was moderate (Cohen's Kappa = .56). When the scores of the two raters were more than one point apart, the raters discussed and came to an agreement. After obtaining the final scores from raters, a two-way repeated measures ANOVA was conducted to examine if there were any significant differences between pre- and post-test scores in the control and experimental groups.

2.4. Qualitative analysis

To answer the second research question, we used the Appraisal framework (Martin & White, 2007) from Systemic Functional Linguistics (Halliday & Matthiessen, 2014). More specifically, we used the Engagement system from Appraisal, which focuses on "sourcing attitudes and the play of voices around opinions in discourse" (Martin & White, 2007, p. 35); that is, it is a tool for analyzing how authors position multiple voices (including their own) in writing. In our analysis, we used the Engagement system because we were interested in how students negotiated multiple voices (i.e., those in the two source texts as well as the student writer's own voice). The Engagement system helps us to see how "every utterance enters into processes of alignment or misalignment with others, helping us to understand the levels and types of ideological solidarity that authors maintain with their potential readers/listeners" (Otefiza, 2017, p. 457). The Engagement framework has been used in previous studies to examine second language writers' integration of information from source texts (e.g., Lam & Crosthwaite, 2018; Lee, Hitchcock, & Casal, 2018; Miller, Mitchell, & Pessoa, 2014; Mitchell, Miller, & Pessoa, 2016; Mori, 2017).

Although the synthesis instruction in this study did not include specific language for integrating source text voices, the Engagement framework is useful in this study as an analytical lens for understanding the ways in which students negotiated the multiple source text voices and their relationship with the student writer's own voice. In particular, we looked for places where students made connections between ideas from the source text and their own ideas, and places where students made connections between the two source texts, both of which are important features of synthesis writing. Elements of Engagement that were found to be most relevant in the current analysis were Attribute: Acknowledge, Proclaim: Endorse, Proclaim: Pronounce, and Disclaim: Counter moves. Attribute: Acknowledge moves are those by which the author expands the discourse by attributing text or ideas to an external voice, such as through citation or reference to a source text or author (e.g., *According to Dr. Sara Maggitti, cultural shock can have significant impacts on the individual.*) In a Proclaim: Endorse move, the writer gives their endorsement of an idea or otherwise construes an idea as correct or valid, thereby contracting the voices in the discourse (e.g., *It is true that changing the environment makes you have trouble for a little bit.*) Proclaim: Pronounce inserts the author's own voice into the text (e.g., *In my opinion, making friends is the biggest problem for international students.*) Lastly, Disclaim: Counter moves are those in which the writer gives a statement that is counter to what might be expected (e.g., *However, when we stay with friends, even though our mood is not good, we don't want to show our real mind to others.*)

We used the software UAM Corpus Tool (O'Donnell, 2008) to manually code the synthesis writing of students in the control group

and the experimental group. Coding of the 48 essays was conducted by each author individually. We used this software because it allowed us to organize, annotate, and analyze students' essays using a built-in Appraisal network. After independent coding, the two authors discussed their analyses in detail together, tackled different interpretations, and solved their disagreements before making conclusions about their interpretation and finalizing the reporting of the data.

3. Results

Table 1 provides the summary statistics for the two groups at the two different testing levels. To answer the first research question, a repeated measure ANOVA was conducted with one between-subjects variable (group) and one within-subjects variable (time) to see whether the difference between the experimental and control groups and between the pre-test and post-test scores were significant or not.

There was a significant main effect of group ($F = 6.164, p = .022$); the experimental group was rated higher than the control group. The effect size was medium ($\eta_p^2 = 0.236$). The main effect of time was non-significant ($F = 1.564, p = .226$). This means that there was no quantitative change from pre-test to post-test. The interaction between group and time was also non-significant ($F = 0.946, p = .342, \eta_p^2 = 0.045$), showing that there was no difference in the change in scores between the two groups.

The second research question investigated differences in how the participants synthesized the source texts in their writing using the Engagement system from Appraisal. We manually coded the student writing on both pretest and posttest by the experimental group (a total of 26 texts) and control group (a total of 22 texts). As mentioned above, we used the UAM Corpus Tool to facilitate the manual annotation of the students' writing and qualitative comparison of the experimental and control groups' writing in terms of Engagement resources. Our analysis found differences in three categories: 1) citing information from sources, 2) connection between the source texts, and 3) connection between a source text and the student writer's own voice.

3.1. Citing information from sources

As we coded the data set, we observed differences in how the students in the experimental and control groups incorporated voices from the source texts. One of the important aspects of synthesis writing is the ability to write strategically and meaningfully from different sources and integrate different pieces of information into the synthesis. In our analysis, we noticed that the experimental group referred to the source texts more than the control group, as evidenced by their greater use of Attribute: Acknowledge moves (e. g., *According to ...*) to directly refer to information from the source text and attribute that information to the source text author. This could be related to the 'organizing' and 'selecting' stages of the reading instruction, which focused on identifying main ideas and selecting important information from the source texts; by thinking about and discussing the ideas of each source text author, the students may see a greater connection between the authors and their ideas. In addition, in the 'connecting' stage of the instruction, students made explicit connections between the ideas in the two source texts, potentially making a stronger link between the ideas and the sources of those ideas.

In the control group, three (out of 11) students used Attribute: Acknowledge moves on the pretest (and only once each), while six used them on the post-test (ranging from once to three times per text). In the experimental group, five students (out of 13) used Attribute: Acknowledge moves on the pretest; four students did so only once, while one student used them four times. However, in the post-test, 11 students in the experimental group used Attribute: Acknowledge moves, averaging three times per text (ranging from once to six times per text). Similarly, we also found differences in the occurrence of unattributed information from the source texts, with the control group showing an increase from seven students (out of 11) on the pretest to 10 students on the post-test. On the other hand, although 10 students in the experimental group included unattributed information on the pre-test, this decreased to six on the post-test. An example of unattributed information from the source text can be seen in (1).

- (1) Second, making friends is very hard for some international students. One of the reason that international students cannot make a friend is that **American students are friendly and they like to joke, but that doesn't mean a commitment to friendship** (Maha,¹ Control-Post).

The bold portion of (1) is based on Text 1, which states, "American students may be very friendly— they may talk, smile and joke—but this does not necessarily mean a commitment to friendship." The student included this information in their text, but without any attribution.

Looking more closely at how the students used Attribute: Acknowledge moves, we found that students in the experimental group began their paragraphs with a claim, then used an Attribute: Acknowledge move to incorporate information from the source texts to support that claim. Martin and White (2007) describe Attribute: Acknowledge moves as representing a "proposition as grounded in the subjectivity of an external voice," and by doing so, "the textual voice represents the proposition as but one of a range of possible positions" (pp. 98). In (2), a student in the experimental group began the paragraph (in their post-test essay) by making a claim and then used an Attribute: Acknowledge move (*According to text 1*) to incorporate information from the source text to support the claim (*In America, most people are very friendly, but it does not mean that it is to make friend.*)

¹ All names are pseudonyms.

Table 1
Descriptive statistics.

Group	N	Pre-test		Post-test	
		M	SD	M	SD
Control	11	3.23	0.754	3.27	0.720
Experimental	13	3.64	0.452	4.00	0.671

(2) In America, most people are very friendly, but it does not mean that it is to make friend. **According to Text 1**, “friendship is something that is difficult to develop at college and American schools are no exceptions. American students may be very friendly - they may talk, smile, and joke - but this does not necessarily mean a commitment to friendship”. Sometimes American talk with international students because they feel is polite. (Xinyang; Experimental-Post)

In (3), we see a similar pattern, in which a student in the experimental group makes a claim and then brings in information from the source text to support their point.

(3) Cultures might be very difficult, [for example] moving from one country to another country with a new culture might cause cultural shock. **According to Text 1**, “cultural shock describes the loss of emotional balance when a person moves to an unfamiliar environment.” **Also, Text 2 mentioned that** living away from your family and usual lifestyle will make you feel the pressure and anxiety.” (Naser; Experimental-Post)

This pattern can be contrasted with the post-test writing of students in the control group, which contained unattributed information or exact copies of portions of the source texts with no attribution or quotation marks, as in (4).

(4) A second major issue international students have to deal with is making friends. American students may be very friendly. They may talk, smile and joke but this does not mean necessary a commitment to friendship. (Farida; Control-Post)

In (4), the information “American students may be very friendly ...” is copied directly from one of the source texts; however, the student does not acknowledge the source of the information.

Although a general pattern of claim + Attribute: Acknowledge + source text was common in the students’ essays in the experimental group, we did notice some variation in its configuration. For example, the reference to the source text by using an Attribute: Acknowledge move, followed by the interpretation of the source text was found, as in (5) from the experimental group in the posttest. In (6), we see that on the pretest the same student uses no Attribute: Acknowledge move or interpretation.

(5) **According to Text 2**, American students are interested in establishing personal freedom and finding their own ways, people are not always very open to others, or to new experiences outside of their comfort zone. (Kung; Experimental-Post)

(6) People do not like the same things and this makes difficult establish a new friendship. (Kung; Experimental-Pre)

In (5), the student begins with using an Attribute: Acknowledge move (*According to text 2*), along with an interpretation of the second source essay. However, in (6), the student begins with an interpretation of the second source essay without using an Attribute: Acknowledge move.

3.2. Connections between source texts

Another difference between the control and experimental groups was found in the patterns in which connections between the two source texts were established. In our analysis, we noticed differences in how students created concrete relationships between different voices from the source texts. One of the important aspects of synthesis writing is students’ accountability to strategically integrate and connect information from multiple sources to write university-level academic texts (Zhang, 2013). That is, students need to put the source texts in conversation with each other. This was promoted in the ‘connect’ stage of the instruction, in which students were encouraged to think about connections between the reading texts by finding similarities and differences between the authors’ ideas. On the pre-test, there was only one student in the control group and one student in the experimental group who put the source texts directly in conversation (though there were instances of very indirect connections, as described below), while the others made no direct connection between the source texts. On the post-test, there were no instances of students in the control group directly connecting the source texts, while in the experimental group, seven students made concrete connections. Thus, it seems that the instruction helped students to put the texts into logical relationships with each other.

In some cases, students made only very indirect connections between the source texts. In (7) and (8) below, written by students from the control group, the writers used a simplistic relationship between texts (e.g., numerical sequence, addition) to make a connection between source texts.

- (7) **First**, culture shock can be an effective issue. Some people or students when they come to a foreign country, they feel depressed and unhappy because of loss of emotional balance. When a person moves to an unfamiliar environment it becomes culture shock.

Second, making friends is an issue for international students. There are many reasons for that. One of them if could be making with American friendly, they may smile, talk, but it's not means that they friend, learning that language will can give you more flexibility for making friends. (Ayub; Control-Post)

In (7), the student from the control group begins by using numerical sequence (*First*), followed by a sentence from the first source text. Then, the student uses *Second* followed again by a sentence from the source text to connect the second source text to the first source text. In example (8), a student from the control group begins with an interpretation of the source text. Then, the student uses only "Also" to show the connection between the two source texts.

- (8) A lot of people come to the US for different country because they want get a good education but when this people come to the use they have culture shock because they come to different country, different culture and different language. **Also**, they can't speak with other people and also because American students have a difficult time making friends with international students. (Khalil; Control-Post)

On the other hand, on the posttest, more students in the experimental group deployed a variety of resources to directly connect the source texts, including Disclaim: Counter moves (3 students), Proclaim: Endorse moves (2 students), and Attribute: Acknowledge moves (3 students), which were not found in the control group. Consider (9), in which a student from the experimental group introduces the central idea of the first source text (*One essay think ...*) and then the student uses a counter move (*on the other hand*), followed by an interpretation of the second source text.

- (9) **One essay think** cultural shock is not a weakness, and think it can help an individual to develop emotional illness. Moreover, the essay explain why it is hard to make friends with American students. **On the other hand, second essay focus on** equip you some useful tips when international students are in a new environment and making friends is only one of the part in how to live in an environment. (Yingjiao; Experimental-Post)

In (9), the student effectively deploys a counter move in a way to demonstrate the contradictory ideas of both texts. Similarly, in (10), we see a student drawing on information from one text, and then contrasting it with the second source text by using a counter move (*However*).

- (10) According to Text 1, "friendship is something that is difficult to develop in college, and American schools are not exceptions." **However**, in Text 2, they mentioned that, "making friends is difficult, but not impossible." Also, there are some advices that you can follow to make friends. According to Text 2, "to make friends, you need to take a break from studying and participate in social activities." (Zahra; Experimental-Post)

Here, the student introduces an idea from one source text (*friendship is difficult to develop in college*), and then puts the second source text in contrast with the first using a Disclaim: Counter move (*However*), followed by information from the source text showing ways that it is possible to make friends in college.

Another resource that was used to create intertextual relationships was Proclaim: Endorse moves, which were used by two students. For example, in (11), the student uses a Proclaim: Endorse move (*These two source support that*) to demonstrate an intertextual relationship between two source texts in supporting a common point.

- (11) **These two source support that** the culture shock is the one of the biggest problem for international students study abroad. (Yang; Experimental-Post)

We saw three students use Attribute: Acknowledge moves as a resource for connecting the source texts. In these cases, the student synthesized the source texts by attributing a single idea to both texts, thereby showing a similarity between them, as in (12) and (13).

- (12) **According to the two texts**, people who choose the US to study have [difficulty] to communicate with Americans. (Abdullah; Experimental-Post)
- (13) **According to these two essays**, they all talk about the cultural shock and the [possibility] of making problems. (Yavuz; Experimental-Post)

We saw another sophisticated use of Attribute: Acknowledge moves for the purpose of building a logical relationship between the source texts. More specifically, one student in the experimental group put the texts in a problem-solution relationship based on their interpretation of the source texts.

- (14) In America, most people are very friendly, but it does not mean that it is to make friend. **According to Text 1**, "friendship is something that is difficult to develop at college and American schools are no exceptions. American students may be very friendly

- they may talk, smile, and joke - but this does not necessarily mean a commitment to friendship". Sometimes American talk with international students because they feel is polite. Therefore, they feel that just is a communication activity, not actually want to make friend with them.

Solving this problem need international students to be courageous. **There is a good way to solve this problem, which is from Text 2.** Patrick Coomer said, "soon after arriving, explore your immediate environment. After having gotten advice on personal safety, walk around and get to know your neighborhood". (Xinjiao; Experimental-Post)

In (14), the student begins by pinpointing a precise articulation of the thesis, followed by using an Attribute: Acknowledge move (*according to Text 1*) to clearly state the problem. In the next paragraph, the author attempts to incorporate the solution from Text 2 by using an Attribute: Acknowledge move. The intertextual relationship between two source texts is effectively identified by stating a problem from Text 1 and solution from Text 2. These kinds of sophisticated relationships between source texts were not found in the pretest essays of the experimental group. For example, in (15) and (16), the writers use numerical sequence (*First, Second*) to state either the problems or the solutions from the source texts.

(15) **First** culture shock is the loss of emotional balance that person moves to an unfamiliar environment ...

Second the friendship problem the international students have to deal with making friends the friendship is the most difficult to develop at college (Ahmed, Experimental, Pre)

(16) **First**, communication is a best way that improve English level. Some student meet difficult problem. They should think method to solve instead of waiting people to help him.

Second, join more activities can meet different people. Every people has distinct thoughts, students also meet different communication style. (Xinyang; Experimental-Pre)

In (15), the student begins the sentences with numerical sequences (*first, second*) followed by sentences focused on the problems mentioned in source text 1. On the other hand, in (16), the student uses numerical sequences (*first, second*) followed by sentences focused on the solutions mentioned in source text 2, without reference to the source texts.

3.3. Connection between source texts and own voice

To understand the effectiveness of students' synthesis writing, it is also important to examine how the students make a connection between source texts and their own argumentative position throughout the essay. In the analysis, we found differences in how students strategically built solid relationships between different voices from the source texts and their own voices. As mentioned, one of the features that distinguishes synthesis writing from summarizing is that synthesis writing requires not only integration and connection of source texts, but also connection and representation of new information such as authors' voices to the source texts (Numrich & Kennedy, 2017). This means that students should have a conversation with the source texts and say their opinion. This was emphasized in the 'connecting' stage of the instruction, in which students discussed in small groups the ideas of the source text authors and how those related to their own ideas.

In our analysis, we found that although students in both groups used Proclaim: Pronounce moves to insert their own voice into the text, only some students did so strategically to connect with the source texts. On the pretest, three students in the control group connected their voice with the source texts, but this decreased to two students on the post-test. Among the students in the experimental group, one student made explicit connections between his own voice and source texts on the pre-test, but this increased to four students on the post-test.

In (17) below, written by a student in the control group, the writer expresses their opinion using Proclaim: Pronounce moves (*we all know that, I think*); however, the student does not successfully tie this position to information from the source texts.

(17) First, there are many students have some culture shock when they come to US. **We all know that** there are many cultural differences around the world. [...] **I think** in the US, it is different to make some friendships because they are scared about strangers and always busy. (Farida; Control-Post)

In the synthesis writing of the experimental group on the posttest, more students connected their own argumentized voice with the source texts compared to the pretest essays. Consider (18), the example (*I studied ...*) that the student includes is useful; however, it is not explicitly accompanied by a strong connection between source texts and the author's opinion. In (19) and (20), students in the experimental group inserted their voices using Proclaim: Pronounce moves to connect their voice with source texts explicitly on the posttest (*I totally agree with that, I think this is fact*).

(18) It's hard to make American friends because they tend to be cautions about making commitment. **I studied** in US for 5 months and I couldn't make even one relationship with American guy. (Yavuz, Experimental-Pre)

(19) According to Text 2, when you move to a new culture, that is drastically different from your home culture, you are likely to experience culture shock. **I totally agree with that.** I am on that situation right now. (Abir; Experimental-Post)

- (20) The first essay has elaborated that American students may be very friendly but this does not necessarily mean a commitment to friendship. **I think this is fact.** American usually respect the privacy of themselves and others. (Yun; Experimental-Post)

4. Discussion

The first research question in this study sought to examine whether there were quantitative differences among the control and experimental groups with respect to the scores they received from pretest to post-test. It was determined that students who received reading instruction and practiced synthesis writing with reading instruction did not perform quantitatively better than those who did not receive reading instruction.

This finding did not conform with the work of many previous studies in this area linking instruction with synthesis writing in both L1 and L2 (Segev-Miller, 2004; Zhang, 2013). In L1, Segev-Miller (2004) found that explicit instruction and participants' self-assessment quantitatively improved their discourse synthesis processes and products. Students in Zhang's (2013) study quantitatively improved in their ability to write informative and problem-solution types of synthesis essays based on explicit L2 writing instruction. It should be noted, however, that the length of instruction in Zhang's (2013) study was much longer than that in the present study. The finding of this study also lends credence to Watanabe's (2001) findings acknowledging that independent reading test scores do not only account for successful performance on integrated reading-to-write tasks. This result of the current study adds to this line of research that the quantitative measures of reading instruction outcomes should not be considered as the only indicators of development. This study also is in line with what Doolan (2021) found about the importance of understanding and focusing on source-based instruction in writing.

The findings of this study also emphasize the role of qualitative analysis in the study of academic writing development of second language writers. For answering the second research question, we examined differences in the use of Engagement resources between the experimental and control groups and found qualitative differences between the groups. The participants of the experimental group employed these resources in more meaningful and strategic ways to not only interpret the source texts but also connect their voices to them. This supplements Lee (2008), who found that inclusion of multiple resources was successfully employed in higher-graded essays, as opposed to lower-graded essays which made use of monoglossic moves.

The analysis largely revealed that the experimental group more strategically incorporated the source texts, made connections between the two source texts, and made connections between the source texts and their own voice. Similar to the findings of Miller et al. (2014) and Ryshina-Pankova (2014), who found that both lower-graded and higher-graded essays use Engagement resources, but may differ in *how* they use these resources, the present study found that some moves were used by both the control and experimental groups, but the participants in the experimental group incorporated these resources in a way to include and interpret the source texts. For example, students in both groups used Proclaim: Pronounce moves, but the students in the experimental group did so while making connections between their own voice and the source texts.

5. Conclusions

The present study lays the groundwork for future research into the role of reading instruction in writing performance with the goal of providing instructional reading practices for ESL teachers and empirical/theoretical conclusions for future researchers. This study has shown that differences between the experimental group, who received reading instruction, and the control group were not detectable quantitatively, although qualitative differences were found. The experimental group participants' writing improved compared to the control group in terms of citation, selection and integration of information from source texts, and connection of the student writer's own position with source text information.

Our study contributes to the growing interest in synthesis writing, with a focus on reading instruction. In terms of instructional practices for synthesis writing, this study suggests that reading instruction should be included in academic writing courses, along with writing instruction. Although only a short amount of time was allocated for reading instruction (90 min), the experimental group performed better than the control group based on our qualitative evidence. This finding could provide an insight into the inclusion of reading instruction in writing curricula. For example, since synthesis writing is a cognitively demanding task in writing and includes reading of source texts, the reading instruction can be highly effective in terms of providing students with an appropriate scaffolding and guiding students through carefully planned sequences. The reading instruction can include distinguishing between main ideas and supporting details, finding similarities and differences between the authors' ideas, and selecting important information from the source texts.

We acknowledge that this research study is subject to several limitations of which researchers should be aware. First, the limited number of participants with limited variety of L1 backgrounds means that the results are not generalizable. Also, due to the small number of participants, we may have lacked statistical power to detect potential quantitative changes resulting from the reading instruction. In addition, the participants of both groups were not equal (control group = 13, experimental group = 11). Future research could assess the effectiveness of reading instruction on synthesis writing with more diverse students in various EFL/ESL contexts. Additionally, only a limited amount of time (one week) was devoted to the writing and reading instruction, which could affect the results of the study. In particular, the short duration of the instruction may not have been adequate for finding quantifiable effects of the instruction. Future research should investigate longer treatments (e.g., a semester).

A further limitation is that in addition to the reading instruction discussed in this paper, other possible factors might positively influence the students' synthesis writing development, such as their recurrent practice in other courses like listening, speaking, and grammar, feedback and grades from other ESL instructors, peer discussions, and the use of tutoring resources at the university. Future

research could include a delayed posttest to better measure the benefits of reading instruction in integrated reading-to-write tasks such as synthesis writing.

Author statement

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