

The Effectiveness of Extensive Reading with Different Modes of Journal Writing on EFL University Students' Writing Fluency and Accuracy

Shu-Chu Chen*

This study, adopting a quasi-experimental research design, investigated the relative effectiveness of a 15-week extensive reading plus different modes of journal writing on EFL university students' writing fluency and accuracy. One hundred and eleven participants, with similar initial TOEIC English proficiency levels, were assigned to three experimental groups and one control group. One experimental group participated in an extensive reading plus Chinese journal writing program. The second group was involved in an extensive reading plus English journal writing program. The third group did extensive reading plus English journal writing and teacher corrective feedback while the control group received regular English class instruction. The instruments included a TOEIC English proficiency test, a writing pretest, and a posttest. Students' writing fluency and accuracy were evaluated by two native speakers of English. Data were analyzed by ANOVA with repeated measures to assess the participants' writing fluency and accuracy before and after the intervention. Results showed that extensive reading plus English journal writing with or without corrective feedback significantly enhanced posttest writing fluency from the pretest. Both programs yielded a significantly better effect on posttest writing fluency than the regular class and extensive reading plus Chinese journal writing. For writing accuracy, while all three interventional programs significantly improved posttest writing accuracy from the pretest, extensive reading plus English journal writing with corrective feedback was more effective than the regular class and extensive reading plus English or Chinese journal writing. The results offered empirical support for the application of relevant theoretical

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frameworks, including input, output, and skill acquisition theories. The research held valuable implications for future extensive reading curriculum design incorporating diverse journal writing modes and teacher feedback to enhance students' writing performance.

Keywords: *extensive reading, journal writing, reading-writing instruction, writing accuracy, writing fluency*

廣泛閱讀結合不同寫作模式對大學生英語寫作流利度和準確性之影響

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本研究採用準實驗研究設計，探討 15 週廣泛閱讀結合不同寫作模式對大學生英語寫作流利度和準確性之影響。本研究對象為 111 名英語程度相當之參與者，分配到三個實驗組和一個對照組，實驗組在為期 15 週研究，閱讀自選英文書籍和寫日記，第一組實驗組參與廣泛閱讀加中文日記寫作；第二組實驗組參與廣泛閱讀加英文日記寫作；第三組參與廣泛閱讀、寫英文日記及和教師糾正反饋。而對照組則參加一般英語課程。研究工具包括 TOEIC 英語測試、寫作前測和後測。學生的寫作流利度和準確性由兩位以英語為母語的教師進行評估，並由 SPSS 重複測量的 ANOVA 分析，評估參與者在實驗前後的寫作流利度和準確性。研究結果發現，無論有無教師糾正回饋，廣泛閱讀結合英語日記寫作都顯著提高學生寫作流暢度。對寫作流暢度的影響明顯優於一般英語課程和廣泛閱讀結合中文日記寫作。在寫作準確性方面，雖然三個實驗組後測都比前測顯著提高，但廣泛閱讀結合英文日記寫作與教師糾正回饋比一般英語課程、廣泛閱讀結合英文或中文日記寫作更能顯著提升寫作準確度。研究發現對語言輸入、輸出和技能習得相關理論應用，及廣泛閱讀課程設計結合不同寫作模式及回饋，對提升學習者寫作學習成效有重要實證貢獻及教學啟示。

關鍵詞：寫日記、寫作流利度、寫作準確性、廣泛閱讀、讀寫教學

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1. Introduction

Extensive reading (ER), based on the input theory, refers to reading widely and in large quantities (Day & Bamford, 2002; Gass, 2017; Iswandari & Paradita, 2019). It involves repeated exposure to reading materials in L1 (first/native language) or L2 (second/foreign language) (Bui & Macalister, 2021; Day & Bamford, 1998; Elley, 2000; Herman & Leaser, 2022; Li, Majumdar, Chen, Yang, & Ogata, 2021; Mason & Krashen, 1997; Meniado, 2021; Peterson, 2022; Pigada & Schmitt, 2006; Suk, 2017), providing students with rich input to promote vocabulary and reading in both L1 and L2 research contexts. (Bamford & Day, 1997; Bui & Macalister, 2021; Elley, 2000; Herman & Leaser, 2022; Hermine, 2022; Jeon & Day, 2016; Suk, 2017; Tajika, 2022) in L1 and L2 research contexts.

While researchers have investigated the impacts of extensive reading on several facets of language learning, relatively less research has been conducted on its impact on writing. Among the few studies that have looked into the beneficial effects of ER on writing, the results were mixed (Azizi, Tkáčová, Pavlíková, & Jenisová, 2020; Duong & Trang, 2021; Lee & Hsu, 2009; Linuwih, 2021; Rosenfeld, Leung, & Oltman, 2001).

The premise of the reading-writing connection hypothesis (Fitzgerald & Shanahan, 2000; Hany, 2007) posits that reading plays a facilitating role in writing. Extensive reading provides students with scaffolding materials—they can draw upon during the pre-writing process to practice writing. While many studies have highlighted the close relationship between reading and writing in both L1 and L2 (Grabe & Zhang, 2013; Shen, 2009; Yoshimura, 2009), some research in the English as a Foreign Language (EFL) contexts has

reported that ER did not support writing development (Krashen, 1996; Lai, 1993).

Among the L2 research that investigated the influence of extensive reading on writing, participants' writing drafts were evaluated through subjective rater ratings rather than objective measures in some studies (Norris & Ortega, 2009). As Norris and Ortega argued, second language (L2) writing proficiency is not a unitary but a multi-dimensional construct. It can be well captured by constructs such as accuracy and fluency (Ellis, 2003; Norris & Ortega, 2009), which are stronger predictors of integrated reading-listening and writing abilities. As such, an intervention study on writing performance should concurrently and objectively measure writing fluency and accuracy to ensure enhanced reliability.

Among EFL college students' reading-writing studies, journal writing has been employed as an output writing task in conjunction with extensive reading (Chang, 1996; Park, 2016; Yeh, 2006). However, one source of variation in journal writing tasks is the writing practice in L1 or L2 (Mason, 2004). While some believed that writing in L1 may reduce students' opportunity to pressure themselves in practicing L2 output, others contend that writing in L2 could be more challenging than in L1, and thus hindered students' willingness to express their ideas freely. Further studies are needed to clarify the issue.

Another cause for concern was the lack of sufficient evidence to determine whether error correction in reading and writing programs can help increase writing accuracy. The potential benefits of offering constructive feedback to second language learners' L2 writing have been highlighted by certain researchers (Brown, 2007; Cheng & Liu, 2022; Long, 2007; Thi, Nikolov, & Simon, 2022), whereas some scholars such as Lyddon (2011) have contended that correcting errors in L2 students' writing was not effective. Therefore, it is necessary to evaluate the effect of corrective feedback on L2 writing, particularly regarding grammatical and lexical errors. Additionally, some studies of extensive reading embedded in writing programs did not include a control group (Nakanishi, 2014). Therefore, Nakanishi argued for the inclusion of a control group to explore the influence of reading-writing interventions more rigorously.

To date, research on the impact of extensive reading combined with different journal writing tasks on L2 adult learners' writing performance is scarce. To fill in the gap, this study was motivated to elucidate the effect of extensive reading paired with different

writing tasks. These tasks include journal writing in either L1 or L2, with and without L2 corrective feedback, on college students' writing fluency and accuracy in an EFL context. The findings will help inform instructors about the effectiveness of integrating reading-writing tasks, thus enabling more successful implementation of reading-writing programs.

2. Literature review

2.1 Theoretical background

The theoretical premise of this study was based on the Input, Noticing, Output hypotheses, and Skill Acquisition Theory (Anderson, 2005; Gass & Mackey, 2020). Regarding the Input hypothesis, “comprehensible input was a necessary and sufficient condition for SLA (Second Language Acquisition)” in increasing learners' proficiency with the target language (Ellis, 2021; Krashen, 1985). When students focus on grammar in an environment with rich input, mastery can be most effectively achieved. The quality and quantity of language input learners experience affect both L1 and L2 acquisition (Nassaji & Fotos, 2011). Additionally, the importance of input has been highlighted by SLA theories including the Theory of Universal Grammar (UG), Information Processing Theory (Klahr & Wallace, 2022; McLaughlin, 1990), and Skill Acquisition Theory. The focus of extensive reading is on input rather than output.

SLA theories include the idea of Universal Grammar (UG), information processing theory (Klahr & Wallace, 2022; McLaughlin, 1990), and skill-acquisition theory, all of which place a strong emphasis on input. Developing the productive skills in L2 learning requires more than just understanding the language, even though second language acquisition relies on input (Song & Suh, 2008; VanPatten, 2004). Following another line of argument, some researchers maintained that communication is not enough to develop target-like accuracy and that “noticing” is crucial for transforming L2 input to intake before it can become knowledge that underlies performance. When learners notice an item, they can transfer it for use in language production (Swain, 2005; VanPatten, Williams, Keating,

& Wulff, 2020). When students receive corrective feedback from the teacher, they attend to the input by consciously noticing the target language features and ultimately they modify their output when necessary (Long, 2020; Mackey, 2007; Robinson, Mackey, Gass, & Schmidt, 2013; Schmidt, 2012).

In Swain's (2005) output hypothesis, output can trigger significant cognitive processes and lead to L2 acquisition. According to Swain, the output hypothesis claims that "the act of producing language (speaking and writing) constitutes, under certain circumstances, part of the process of second language learning." In other words, production could drive learners to convert their processing from semantic to syntactic (Sun, 2020) and contribute to acquisition because learners need to be pushed into producing language in speaking or writing to develop full grammatical competence. When learners produce output, they have the chance to test their hypotheses and might progressively become aware of how well-formed and comprehensible their words are. Additionally, the metalinguistic functions of output motivate learners to evaluate their language and consider what they should and shouldn't say. Thus, comprehensible input, noticing, and output altogether can contribute to L2 acquisition (Mackey, 2020; Swain, 2005; Zalbidea, 2021).

2.2 Extensive reading and writing development

Learners in extensive reading studies were exposed to an input-rich environment (Nassaji & Fotos, 2011) and comprehensible input facilitates participants' development of the target language as proposed by Krashen (1985) and VanPatten (2004). Extensive reading leads to better writing abilities in L1 and L2 (Day & Bamford, 1998; Hyland, 2019; Lee, 2001, 2005; Lee & Krashen, 2002; Mason, 2004; Mermelstein, 2015). For instance, in their review of several L1 research, Stotsky (1983) and Krashen, Terrell, Ehrman and Herzog (1984) noted that reading seems to have a beneficial impact on individuals' writing abilities, suggesting that students who read a lot before college go on to write better in college. In L2 research, Day and Bamford reported that writing was also affected by extensive reading (Linuwih, 2021). In another ER study, Sakurai (2017) reported that among 157 non-English major Japanese college students, some read extensively while others had no prior experience with ER. Results showed that participants' lexical and

grammatical skills in writing improved significantly after reading more than 108,000 words.

In a recent study of Linuwih (2021), 34 university students were placed in a traditional English class, receiving grammar instruction and writing practices. For the experimental group, 34 students in an ER class participated in an ER program that included writing tasks related to the reading. Results showed that students in the ER group made statistically significant progress on their posttest, while those in the traditional class only showed modest improvement.

While some students have reported improvement in their writing scores because of reading books in ESL (English-as-a-Second-Language) or EFL contexts, negative outcomes for students have been found in both short- and long-term reading programs in some studies. For instance, Lee and Krashen (1996) identified a somewhat favorable connection between the assessments of 318 Taiwanese students' writing proficiency and free voluntary reading. Similarly, according to Lai (1993), four out of eight groups of 345 learners who took part in an ER program for a whole year improved their vocabulary, reading speed, and listening. Nonetheless, they did not surpass the control group in writing skills.

In another study, Kirin (2010) conducted a study on Thai EFL students' writing performance after their participation in a 15-week extensive reading program. The participants were divided into two groups according to their reading exposure, with one group categorized as "high" and the other as "low." The participants' essay writing abilities were evaluated every five weeks throughout the program, which involved reading simplified books. The study found that despite the additional reading, the students' writing abilities did not improve. The researcher suggested that factors such as low motivation and difficulties in reading simplified books may have contributed to the lack of improvement.

Previous studies have reported both positive and negative relationships between extensive reading and writing, based on the amount of reading and time spent learning the target language. However, contradictory findings drawn from some empirical evidence about reading and writing seem to rule out a systematic relationship between the two variables. This phenomenon needs further verification through this current study, which aims to scrutinize the correlation between reading and writing in a context where L2 input

was insufficient.

2.3 Meta-analysis of ER and writing fluency and accuracy

Numerous studies have explored the effect of ER on writing. Among these studies, Mermelstein (2015) undertook a one-year study to examine the effects of an upgraded version of extensive reading (ER) on learners' writing, evaluating content, organization, vocabulary, language use, mechanics, and fluency. Fluency was measured by counting the total number of words produced by each participant, as used in the study of Lee and Hsu (2009). The results showed significant improvements in content, organization, vocabulary, language use, mechanics, and fluency. Notably, the most substantial improvement was observed in fluency, with an effect size of 0.97.

In another study, Poorstoti and Asl (2016) examined the influence of extensive reading on the writing competence of EFL learners. The research included 30 advanced female EFL learners as participants. For the pretest, they were given the task of writing a paragraph on a topic from their course book. For the posttest, they were instructed to compose a paragraph on a similar topic. The writing performance was evaluated using the scale developed by Jacobs, Zinkgraf, Wormuth, Harfield and Hughey (1981), which focused on content, organization, vocabulary, language use, and mechanics. Additionally, the fluency of the writing was assessed by calculating the number of words per t-unit. The research findings demonstrated that extensive reading had a positive impact on the learners' writing fluency.

In addition, numerous meta-analyses of extensive reading and writing have been undertaken. For instance, in the meta-analysis by Nakanishi (2014), the researcher extracted thirty-four studies from 156 research. The findings revealed that extensive reading had a medium effect on reading comprehension ($d = 0.63$), a large effect on reading rates ($d = 0.98$), and a small effect on vocabulary ($d = 0.18$). In another meta-analysis, Lee (2016) analyzed 47 ER studies between 1990 and 2015 and found that ER had small to medium effects ($d = 0.40$) on vocabulary, reading comprehension, and spelling, but only small effects ($d = 0.23$) on writing. Kim (2012) also conducted a comprehensive meta-analysis on extensive reading, which covered both the cognitive domain (e.g., vocabulary, listening, reading speed, reading, and writing) and the affective domain (e.g., interest, attitude,

motivation, and anxiety). The meta-analysis was based on twenty-one papers selected from research databases on extensive reading. The findings showed that extensive reading was beneficial in enhancing various cognitive skills, such as vocabulary ($d = 0.73$), reading speed ($d = 0.80$), reading comprehension ($d = 1.06$), and listening ($d = 1.94$). In contrast to Lee, Kim found a large effect size for writing ($d = 1.04$). Similarly, Graham and his colleagues conducted a meta-analysis by reviewing studies that employed true or quasi-experimental designs and were written in English. They aimed to examine the impact of reading interventions on writing in students from preschool to Grade 12 (Graham et al., 2018). The results indicated that students' increased interaction with text through reading produced a statistically significant positive impact on overall writing ($d = 0.35$) and specific measures of writing quality ($d = 0.44$) or spelling ($d = 0.28$).

Despite the findings of the relation between ER and writing, writing fluency is a term that was defined and assessed differently in previous studies. Some scholars adopted a qualitative process-based approach, which was more suitable for studying smaller samples, while others employed a quantitative product-based approach to study fluency. For example, Polio (2012) measured writing fluency by calculating the average clause length by dividing the total word number by the number of clauses in an entry. Writing accuracy, on the other hand, was evaluated by counting error-free T-units per T-unit (EFT/T). Similarly, Storch (2009) utilized clause length and T-units to measure writing fluency for ESL university students' writing studying in Australia.

On the other hand, some studies have shown that composing processes and linguistic structures correlated with writing performance. For example, Sasaki (2000), using simulated recall protocol, reported that expert and novice writers, with small sample size, differed in terms of pre-writing planning time, frequency of pause during writing and strategy use and that L2 proficiency explained part of differences in writing. Reynolds (2005) identified variations of linguistic patterns existing in writing between regular L1 language arts 5th-8th student writers from U.S.A. and ESL students. The study found that the former group had a stronger grasp of linguistic structures used for rhetorical or social purposes, in contrast to the latter group, which demonstrated less proficiency.

The present study adopted Polio's quantitative methods (1997, 2012) to measure

writing fluency and accuracy. The researcher recruited four classes of the participants, ensuring a large sample size with comparable L2 proficiency, reading/writing skills, and engineering backgrounds. All participants took similar language skill classes from the same instructor. For these reasons, they were a desirable sample for the present study so that the interference of L2 proficiency, major, language abilities on writing could be controlled and minimized. This was achieved together with the teachers' provision of guidelines for journal writing set for specific rhetorical purposes, which was described in the methodology.

2.4 Teacher feedback in L2 writing

Teacher feedback in L2 writing has been the subject of controversy. Some studies have shown that receiving feedback from teachers is not more helpful for improving writing accuracy in L2 than receiving no feedback (Krashen, 1982; Polio, Fleck, & Leder, 1998; Truscott & Hsu, 2008; Xudong, Cheng, Varaprasad, & Leng, 2010). For instance, in Kepner's study (1991), Spanish FL (Foreign Language) learners were divided into a control group without correction and an explicit corrective group. There was no noticeable difference in errors after 12 weeks of training. Polio et al. (1998) investigated whether additional editing guidance reduces sentence errors in revised drafts. They found that the experimental group, which received extra rewriting guidance and feedback, did not outperform the control group in linguistic accuracy after the revisions of 64 ESL students were analyzed at the end of the program.

In another study, Truscott and Hsu (2008) reported that giving students feedback on their errors through underlining during the revision process resulted in a significant enhancement in their writing quality when compared to a group that did not receive such feedback. However, a subsequent narrative writing task a week later revealed no difference in the error rate between the two groups, suggesting that the reduction of errors during revision is not a reliable indicator of long-term learning. Truscott and Hsu stated that the improvements made during revision may not imply that correction effectively improves writing skills. Similarly, Xudong et al. (2010) examined the effects of an English course on Singaporean graduate students' academic writing skills, and found little improvement in

grammar accuracy.

However, some recent studies (Aida & Widiyati, 2020; Ellis, Sheen, Murakami, & Takashima, 2008; Evans, Hartshorn, McCollum, & Wolfersberger, 2010; Sheen, 2007) have shown that ER is effective for writing and that written Corrective Feedback (CF) can lead to acquisition. For instance, in the study of Robb, Ross and Shortreed (1986), four treatment groups of Japanese undergraduate EFL students showed improved writing accuracy after receiving feedback in various forms, such as direct correction, error type coding, and highlighting to indicate error locations in the text. Each group improved fluency and syntactic complexity.

Among the few ER studies focusing on reading, writing, and feedback, Tsang (1996) investigated 144 students' writing over twenty-four weeks. The extensive reading group read eight books and completed eight book reviews, while a writing group completed eight essay-writing tasks and received comments on the essays. Students in the control group continued with their regular English program. The participants' essays were graded based on the rubrics for vocabulary, organization, content, mechanics, and language use. The results demonstrated that the extensive reading group improved significantly in language use and content. Similarly, Evans et al. (2010) reported that Written Corrective Feedback (WCF) improved linguistic accuracy in ESL students' paragraph writing over a 13-week semester. However, their study was criticized for the absence of a control group that did not receive any correction feedback. More studies using experimental and control group designs have also discovered that WCF can enhance L2 learners' writing accuracy (Suzuki, Nassaji, & Sato, 2019; Van Beuningen, De Jong, & Kuiken, 2012).

2.5 The role of using L1 or L2 in journal writing task

In terms of the role of using target language or learners' native language in writing tasks within a study, the findings have been mixed (Lo, 2016; Mason & Krashen, 1997; Van Weijen, Van den Bergh, Rijlaarsdam, & Sanders, 2009).

For instance, Van Weijen et al. (2009) examined the extent to which writers incorporated their native language (L1) during second language (L2) writing. They engaged 20 students in writing four essays in both L1 and L2, concurrently verbalizing their

thoughts. The analysis focused on the students' engagement in various conceptual activities such as idea generation, planning, and making metacomments, and examined the relationship with their writing proficiency, proficiency in L2, and the overall quality of their L2 writing. The study revealed that using L1 during L2 writing negatively impacted the quality of L2 writing, while using L2 exhibited a favorable impact on the quality of L2 writing for certain conceptual activities but was negative for others.

Shin, Dixon and Choi (2020), drawing on a review of studies from 2011 through 2018, presented a comprehensive review on the use of L1 in EFL contexts, concentrating on the efficiency of L1 use in developing L2 abilities. The results indicate that using L1 as a resource into the curriculum is effective. In another study, Lo (2016) examined 26 EFL Chinese undergraduate students' performance in two writing tasks: L1-L2 translation versus L2 writing. The students were divided into two groups, with the L1-L2 translation group showing significantly better lexical and grammatical usage than the group writing directly in L2.

Mason and Krashen (1997) conducted three studies and demonstrated the superiority of extensive reading over traditional methods in enhancing reading comprehension, writing, and reading speed.

Among the three experiments, specifically in Experiment 3, the researchers aimed to explore whether writing in the first language or second language had different effects on students' reading and writing progress. The English response group wrote their responses in English, while the Japanese response group wrote their summaries in their native language, Japanese. The results showed that participants who composed summaries in their first language, Japanese, attained superior improvements in both writing and reading speed. The findings did not strongly support the output hypothesis.

Mason (2004) explored the role of extensive reading on writing summaries and summary revision to determine if including writing in an extensive reading program can improve learners' grammatical accuracy. The study involved three groups: one composed summaries in English, another in Japanese, and the third wrote summaries in English, received feedback, and revised the summaries. Although the study's approaches did not benefit the participants as expected, combining extensive reading with writing summaries

in Japanese proved to be the most effective among the groups.

2.6 Gaps in literature

A review of related literature has shown some methodological limitations, such as the absence of a control group in research designs (Robb et al., 1986). In addition, most previous studies assessing L2 learners' written performance used holistic ratings instead of using linguistic complexity measures (e.g., accuracy or fluency). The use of a single method like holistic measures, which are based on the subjective judgments of raters, does not provide a holistic picture of the effects of interventions. Polio (2012) suggests that utilizing one measure can be misleading and fails to capture the multidimensionality of L2 writing performance.

Based on the reading-writing hypothesis, there is a dearth of research examining the effect of extensive reading integrated with different modes of writing tasks on L2 students' word fluency and accuracy concurrently. To address these limitations, this study, using a quasi-experimental research design, examined the effects of extensive reading integrated with different modes of journal writing tasks, including journal writing in L1, in L2 and in L2 plus teacher corrective feedback (Khezlrou, 2020; Qi & Lapkin, 2001; Swain & Lapkin, 2002), a less-researched aspect of reading-writing instruction, on university students' writing fluency and accuracy, in comparison with the regular English reading class without any intervention.

2.7 Research purposes and research questions

The purposes of this study are twofold: first, to examine the impact of extensive reading with journal writing in L1, extensive writing with journal writing in L2 and extensive writing with journal writing in L2 plus teacher corrective feedback on the writing fluency and accuracy of Taiwanese EFL university students; second, to ascertain the comparative effectiveness of the three interventional programs. The research questions that guided the study are as follows:

1. Will intervention programs-extensive reading with journal writing in L1, extensive writing with journal writing in L2 and extensive writing with journal writing in L2

plus teacher corrective feedback-facilitate university EFL students' writing fluency and accuracy?

2. Which intervention program will lead to a superior effect on writing fluency, as measured by the number of words per a clause length (word/clause), and on writing accuracy, as measured by error-free T-units per T-unit (EFT/T)?

3. The study

3.1 Research design and procedure

The study implemented a quasi-experimental design to explore the effects of extensive reading combined with three different modes of journal writing tasks on EFL college students' writing fluency and accuracy. Before the training program, the pretest writing was conducted. After the training program, their writing performance was compared with that of the control group who received regular English instruction without any intervention.

3.2 Participants

At a university in Taiwan, one hundred and eleven engineering majors consented to participate in this study and were taught by the same English teacher. The participants were assigned to three experimental groups, i.e., the extensive reading plus Chinese journal writing group (the Chinese group, $n = 27$), the extensive reading plus English journal writing group (the English group, $n = 28$), and the extensive reading plus English journal writing and teacher corrective feedback group (the Feedback group, $n = 28$), and the control group ($n = 28$) for a 15-week reading-writing program.

A background questionnaire and a TOEIC (Test of English for International Communication) reading and listening test were administered at the beginning of the study to all participants, none of whom had lived abroad for more than two weeks prior to the teaching intervention. Their average TOEIC reading and listening scores ranged from 480 to 510. They were recruited because of several reasons.

First of all, based on this university language policy, freshmen were required to take an English placement test, and were then placed into different levels of classes ranging from

Level A (high level), Level B (low intermediate level), or Level C (low level) based on their scores of the test. These students were placed in level B classes because their TOEIC English proficiency scores were around the low intermediate level.

Secondly, all participants were engineering students with similar prior experiences and background knowledge. They were taught by the same instructor and used the same textbook in their regular Freshman English classes. The classes included listening and speaking practices, and introduced basic sentence structures such as simple sentences and compound sentence, along with writing exercises that involved describing cities, people, typical days, or places.

Based on these concerns, being selective in participant recruitment can minimize the influence of external factors, such as participants' English proficiency, instructor, English teaching content and teaching materials, on the outcome of the teaching intervention. These can help to ensure that any progress noticed in the participants' abilities are more likely attributable to the training itself, rather than to these other factors.

The Chinese group engaged in extensive reading and wrote weekly Chinese journals; while the English group engaged in extensive reading and wrote weekly English journals. The feedback group also engaged in extensive reading and wrote weekly English journals but, in addition, received teacher's direct corrective feedback. The control group attended standard English classes. Before the intervention, participants took an English proficiency pretest (TOEIC reading and listening) and a writing pretest, administered by the researcher during the first week of the new semester. All four groups demonstrated equivalent initial TOEIC English proficiency levels and writing ability before the intervention. They all took the writing posttest after the intervention.

3.3 Training program, reading materials and writing task for the experimental groups

The training program lasted for 15 weeks, starting from March 2016 and ending in June 2016. The e-book based Extensive Reading Program (ERP) was introduced in the second week of March 2016, and was implemented for the three experimental groups. They read and wrote journals outside of class during the 15-week e-book ERP.

To effectively implement the extensive reading program, the researcher followed suggestions proposed by Bell (1998), Coady (1997), and Day and Bamford (2002). As Day and Bamford noted, "The success of extensive reading depends largely on enticing students to read." Furthermore, Coady emphasizes the importance of selecting extensive reading materials that align with the reader's interests and background knowledge in order to benefit and encourage readers to read large amounts with successful comprehension. The following guidelines were used to guide students on how and what to read to promote extensive reading.

First, to create a reader-friendly e-books reading environment, the researcher included a range of reading materials, such as books, magazines, which were easily accessible to students (Bell, 1998; Coady, 1997; Krashen, 2004), and catered to students' interests and English proficiency levels to enhance motivation and engagement (Guthrie, Wigfield, & VonSecker, 2000). Students were advised that harder texts might not benefit them more. They were encouraged to choose easy, proficiency level appropriate materials, such as descriptive or narrative texts.

Second, following the principles recommended by Susser and Robb (1990) and Nation and Waring (2019), the researcher set achievable goals, recommending students to read at least 2 hours a week (Locke & Latham, 2002). Students were also instructed to read for the general understanding of the books at their own pace, and to read as much as possible in their free time.

Third, the researcher asked students to keep a reading journal documenting the number of pages read, the titles of books completed, and the time spent reading and checked their records periodically. If the minimum requirement was not met, students were asked to increase their reading hours so that the amount of time spent on extensive reading would be sufficient.

For the extensive reading program's reading materials, the researcher followed the study of Chen, Chen, Chen and Wey (2013), who categorized e-books into three graded libraries—Green Hill, Blue Ocean, and Brown Volcano—from the easiest to the most difficult. These were arranged based on authenticity (Bamford & Day, 1997; Krashen, 1997; Nuttall, 1996) and simplification (Cho & Krashen, 1994), allowing students to choose

books according to their reading level. In addition to oral instructions, the researcher provided students with reminders in print and introduced three online libraries both in English and Chinese for their reference.

To enhance the connection between extensive reading and writing, the researcher designed journal writing tasks that aligned with the content of the extensive reading materials. Coady (1997) suggested that writing short reviews, summaries, or responses to the reading content in journal writing could serve as a check on reading comprehension. Following this recommendation, journal writing and brief summaries of the reading material were used (Grabe & Zhang, 2013; Reid, 1997). The participants had the flexibility to read a variety of texts based on their interest, such as an interesting storybook or a scientific report, suitable for their English proficiency level, and then wrote about their understanding and insights on that topic.

To better control composing time and linguistic structure, the teacher provided journal writing instructions and guidelines set for specific rhetorical purposes of description and narration, in advance. Participants were required to complete their journal reflections within a 2-hour time limit after class, documenting their thoughts and reactions to the texts they read. This self-reflection assisted them in understanding the connection between reading and writing and in improving their skills. Since students wrote journals after extensive reading outside of class, they were asked to monitor and record their writing time. In the regular reading classes, they used textbooks at a similar level that contained mostly simple, and compound sentences, with some complex sentences, and practiced writing skills like description suitable for the classes taught by the same instructor.

Following the general guidelines in practice by Susser and Robb (1990) as well as Nation and Waring (2019), the journal entries comprised three parts. The first part included information about the book title, author, reading period, the time devoted to reading the books, and the number of pages read weekly (Bell, 2001).

In the second part of their journal entries, participants were first required to list 15 new words they learned while reading, and then write a sentence using those words (Stubbs, 2001; Walters, 2004). For instance, they might learn the word “bark” and write “The dog barked as it ran through the park.” In addition, they were to describe the book’s

content—including characters, places, actions—and relate the book contents to recent or historical events and their personal experiences, as suggested by Lyutaya (2011).

For example, “Hans Christian Andersen wrote a short story entitled ‘The Little Match Girl On New Year’s Eve,’ a little girl who is very poor sells matches on the street. She is unable to sell any matches despite the cold and her hunger, and the next morning she freezes to death. The girl’s pain is made worse by the cold and snow because the story takes place on New Year’s Eve in a tiny village. The little match girl, who is described as being impoverished and wearing rags, is the story’s major character. She is also depicted as having a vivid imagination and being extremely lonely. She is described throughout the narrative lighting matches to stay warm and get away.”

“The story’s main character is the Little Match Girl and the only other interactions are with the people who pass her by on the street and ignore her pain. The story discusses the importance of being kind and caring for people who are in need. In the modern world, where problems like homelessness, poverty, and inequality are major social problems. The story is similar to the present refugee situations. People are forced to escape their countries because of conflict, war, and unstable economic conditions. Many of these people, especially the children, live in very bad circumstances. The Little Match Girl let us know the importance of compassion and the need to help those who are less fortunate.”

In the third part of the journal, students were asked to look for memorable or fascinating sections that they wanted to share. The quotations, their rationale for choosing them, and their comments on the passage should be included in the entry (Kletzien & Hushion, 1992; Lyutaya, 2011).

In this study, the three experimental groups each wrote 15 journal entries with a variation of tasks (i.e., English journal writing; Chinese journal writing; English journal writing with teacher corrective feedback). The instructor’s input on the journal entries addressed errors in articles, subject-verb agreement, run-on sentences, sentence fragments, verb tenses, punctuation, vocabulary errors, prepositions, and other areas. Feedback on students’ content, organization, grammar, spelling, and other suggestions was provided at the end of each entry if needed.

3.4 Instruments

The instruments included the participants' background information, TOEIC reading and listening test, a writing pretest, and a writing posttest.

3.4.1 The participants' demographic information

Most participants were male college freshmen, with an average age ranging from 18 to 20 years old. They have been learning English for approximately 9 to 10 years. They did not have any experience of living in English-speaking countries. The average score of their TOEIC listening and reading tests was about 480.

3.4.2 English proficiency test and writing pre- and post-tests

A TOEIC test and a writing pretest were administered as the pretest before the implementation of the program, and a writing posttest was conducted after the training program. The writing prompt for both the pre- and post-test was "An unforgettable experience," which remained consistent. Students wrote a composition of over one hundred words in class before and after the intervention.

The chosen topic was descriptive writing because it would allow for the assessment of learners' descriptive writing skills. Descriptive writing is an appropriate and easy type of writing for EFL non-English major freshman students whose TOEIC scores are around 480, low-intermediate level. It focuses on describing people, places, things, or events without requiring advanced grammatical and vocabulary knowledge. The topic allows the researcher to evaluate students' ability to use descriptive language, imagination, and attention to details to create a mental picture for the reader. Starting with descriptive writing can help students build their confidence and become more comfortable with using English to express themselves.

Secondly, after each week's reading, three experimental groups were required to write a journal entry. They were informed to describe the setting, characters and feelings from their reading experiences, following the journal writing guidelines. Therefore, choosing topics of descriptive writing linked their reading to writing. It also helped students practice conveying emotions and sensory details effectively.

The approach of starting with simpler forms of writing such as descriptive writing and

gradually progressing to more complex forms, allows students to develop their writing skills in a gradual and manageable way. Expository and persuasive writings, which demand a higher command of grammar and vocabulary, as well as the ability to present information clearly and use evidence to support arguments, are worthy of future investigation for more advanced EFL learners.

To ensure the objectivity of the writing assessment, the compositions were graded by two English native speakers, one majoring in linguistics and the other in psychology, respectively. They had at least eight years of experience in English teaching at a university level. Pearson product-moment correlation coefficients were employed to calculate the inter-rater reliability for students' writing fluency and accuracy. The inter-rater reliability scores for the pretest and posttest were .87 and .88, respectively.

3.5 Scoring rubrics to evaluate writing fluency and accuracy

Based on Polio (1997), writing fluency was measured by the total number of words divided by the number of clauses in a student's writing (words/clause). A clause is defined as a group of words containing a subject and a finite verb. Imperative sentences with a covert subject are considered clauses, whereas clauses which contained only an auxiliary verb are not considered separate clauses.

In order to measure the participants' writing fluency, the researcher calculated the total word count in a clause length in both pre- and post-tests. To measure the average clause length, the researcher divided the total word count by the number of clauses in an entry.

For example, "John left and drove away." was counted as one clause containing five words; "She wanted John to leave the library." was counted as one clause containing seven words. "Helen likes to ski and Linda does too." was counted as only one clause with eight words, even though the auxiliary verb "does" is not finite; "When he came home, he was exhausted." was counted as two clauses, which contained four and three words, respectively. If a journal entry comprised 20 clauses and 200 words in total, the average clause length would be calculated as 10 words per clause (200 words divided by 20 clauses).

Writing accuracy was evaluated by counting the number of error-free T-units per total T-unit (EFT/T) following Polio's method (1997). A T-unit is defined as one independent

clause along with all dependent clauses. In other words, one main clause with its subordinate or embedded clause was a T-unit (as cited in Storch, 2009). To measure students' writing accuracy using the method of Polio (1997, 2012), the researcher first identified all the T-units in a written text. Then, the researcher counted the number of T-units that are error-free (EFT) and divided that number by the total number of T-units (T). For example, a complex sentence like "I know that you went to the park." had one T-unit; a run-on sentence like "My college was in Los Angeles, it was the best college there." contained two T-units; a sentence missing a copula like "I standing in the lobby." was counted as one T-unit. A standing-alone subordinate clause like "that I don't know." was attached to the preceding or following main clause and altogether was counted as one T-unit; A coordinated clause like "We went to our school and started the class at 9." was counted as one T-unit; a clause with quotation like John said, "Mary is my best friend." was counted as two T-units; a clause with a tag question like "You like it, don't you?" was counted as one T-unit. So, if a student's writing consists of 20 T-units, with 15 being error-free, the EFT/T ratio would be $15/20 = 0.75$.

A similar scoring procedure was applied to the pretest and posttest writing. Frequency counts for writing fluency and accuracy were calculated for each group by two teachers in both pre- and post-tests to facilitate analysis of the intervention's effects.

3.6 Data analysis

The writing scores were analyzed using SPSS software. "Group" was treated as between-subjects factor and "test time" (pretest vs. posttest) as a within-subjects factor, with writing fluency and accuracy as the dependent variables. An alpha level of .05 was set for the analysis using repeated measures ANOVA (Howell, 2009). Since a significant interaction effect, with sphericity confirmed via Mauchly test ($p > .05$), overrode the main effect, the resulting interaction effect was further analyzed by one-way ANOVA and post hoc comparisons to identify specific causes of the observed variations within and between groups.

Prior to one-way ANOVA, homogeneity of variance was assessed (Chang, 2008; Howell, 2009; Lin, 1992) with Levene's test for posttest writing fluency and accuracy

among the four groups. Based on Levene's test ($p < .05$), the assumption of equal variances was violated. Consequently, a Welch ANOVA, suitable for unequal variances, followed by Dunnett T3 post hoc test, appropriate for subgroups with fewer than 50 participants (Chiu, 2010; Howitt & Cramer, 2007), was conducted for pair-wise posttest comparisons. Additionally, Paired Samples t -tests were applied to examine the progress from the pretest to the posttest by applying Bonferroni adjustment technique to avoid Type I errors (Howell, 2009). The four groups showed comparable levels of English proficiency and writing abilities prior to the intervention. Similar statistical analyses were employed to analyze writing fluency and accuracy.

4. Results

4.1 Writing fluency

Table 1 describes descriptive statistics for the groups' means of word/clause in pretest and posttest writing fluency.

Table 1. Descriptive Statistics of Pretest and Posttest Word Fluency in Each Group.

Group	<i>N</i>	Test time	<i>M</i>	<i>SD</i>
Control	28	Pretest	8.47	1.57
		Posttest	8.52	2.05
Chinese	27	Pretest	8.39	1.06
		Posttest	8.64	1.72
English	28	Pretest	8.47	1.17
		Posttest	10.39	1.53
Feedback	28	Pretest	9.26	2.14
		Posttest	12.45	3.55

The data were first analyzed by two-way ANOVA with repeated measures. As presented in Table 2, the results showed that the main effect of group ($F(3, 78) = 12.34, d = .32$), the main effect of test time ($F(3, 26) = 77.88, d = .75$), as well as the interaction

effect of group x test time ($F(3, 78) = 9.86, d = .38$) all reached significance ($p < .001$).

Table 2. Result of Two-Way ANOVA with Repeated Measure in Writing Fluency

Source of variance	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Main effect				
Group	3	200.4	91.67	12.34***
Test time	1	99.09	99.09	77.88***
Interaction effect				
Group × Test time	3	89.53	29.85	9.86***

Note. *** $p < .001$

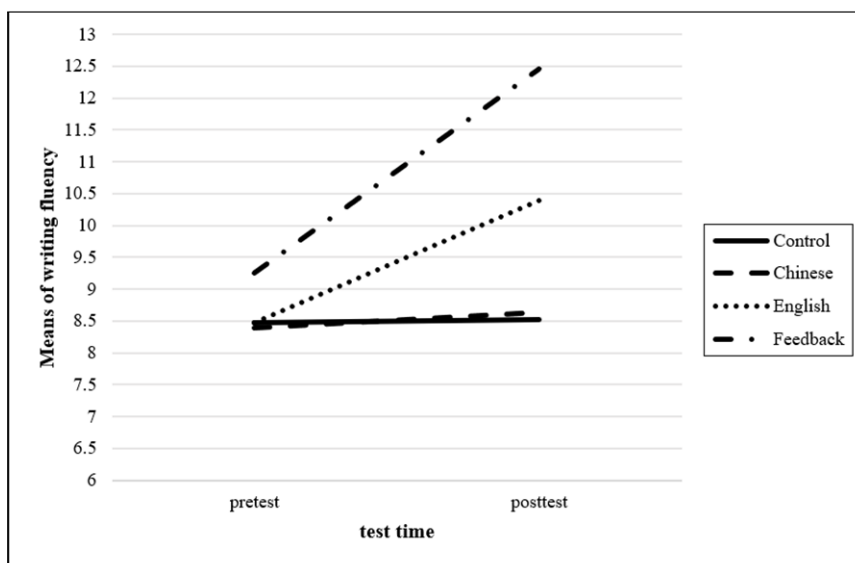


Figure 1. Interaction Curve Pattern of Writing Fluency

In view of the prominent interaction effect observed between Group and Test time, the researcher first compared pretest scores among the four groups using one-way ANOVA and

Levene's test, which confirmed equality of variances in the pretest ($p > .05$). The result of one-way ANOVA showed no significant difference in pretest writing fluency among the four groups ($p > .05$), suggesting a comparable level of writing fluency before the intervention.

To examine progress from the pretest to the posttest, Paired Samples t -tests were conducted with the alpha level adjusted at .0125 (i.e., .05 divided by 4 contrasts) to avoid Type I errors, using Bonferroni adjustment technique (Howell, 2009; Howitt & Cramer, 2007). As shown in Table 3, the results suggested that only the Feedback and English groups made significant progress in posttest writing fluency from the pretest ($p < .0125$), while the Control and Chinese groups did not show such progress ($p > .0125$). This suggested that extensive reading combined with English journal writing, with or without teacher corrective feedback, significantly enhanced participants' posttest writing fluency.

Table 3. Difference between Pretest and Posttest in Writing Fluency in Each Group

Group	<i>N</i>	Test time	<i>M</i>	<i>SD</i>	<i>t</i>	effect size
Control	28	pretest	8.47	1.57	.07	.01
		posttest	8.52	2.05		
Chinese	27	pretest	8.39	1.06	.74	.14
		posttest	8.64	1.72		
English	28	pretest	8.47	1.17	7.73***	1.46
		posttest	10.39	1.53		
Feedback	28	pretest	9.26	2.14	7.09***	1.34
		posttest	12.45	3.55		

Note. *** $p < .00025$

To examine the difference in posttest writing fluency among the four groups, the researcher conducted a one-way ANOVA. Levene's test for equality of variances showed significant differences ($F = 5.86$, $df1 = 3$, $df2 = 108$, $p = .001 < .01$), suggesting unequal variances. Consequently, a Welch ANOVA was performed due to this inequality ($F = 17.23$,

$df1 = 3$, $df2 = 59.09$, $p = .000 < .001$) followed by Dunnett T3 for pairwise comparisons (Chiu, 2006; Dunnett, 1980; Howell, 2009). The results, summarized in Table 4, revealed that the Feedback and English groups outperformed the Chinese and Control groups in writing fluency posttest. These findings suggest that the integration of extensive reading and English journal writing, with or without teacher correction feedback, resulted in a significantly superior effect on posttest writing fluency when compared to the regular classes and extensive reading with Chinese journal writing.

Table 4. Summary of Posttest Writing Fluency among the Four Groups

Group	<i>N</i>	<i>M</i>	<i>SD</i>	Levene	Welch	Post Hoc
				<i>F</i>	<i>F</i>	
Control	28	8.52	2.05	5.86***	17.23***	Feedback > Control***
Chinese	27	8.64	1.72			> Chinese***
English	28	10.39	1.53			English > Control***
Feedback	28	12.45	3.55			> Chinese***

Note. *** $p < .001$

4.2 Writing accuracy

Table 5 presents the descriptive statistics of the mean scores of each group in the writing pretest. A two-way ANOVA with repeated measures was conducted to examine the four groups' performance in the posttest from the pretest writing accuracy, with "group" as between-subjects factor and "test time" as within-subjects factor. Writing accuracy was measured by the ratio of error-free T-units to total T-unit (EFT/T).

Table 5. Descriptive Statistics of Pretest and Posttest Writing Accuracy

Group	<i>N</i>	Test time	<i>M</i>	<i>SD</i>
Control	28	Pretest	.06	.08
		Posttest	.09	.1
Chinese	27	Pretest	.07	.07
		Posttest	.16	.15
English	28	Pretest	.09	.1
		Posttest	.18	.16
Feedback	28	Pretest	.08	.08
		Posttest	.32	.21

The results, as presented in Table 6, showed significant effects: the main effect of group ($F(3, 78) = 20.05, d = .435$) and the main effect of test time ($F(1, 26) = 21.21, d = .993$) as well as the interaction effect of group x test time ($F(3, 78) = 19.86, d = .433$) were all found to be significant.

Table 6. Result of Two-Way ANOVA with Repeated Measure in Writing Accuracy

Source of variance	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>
Main effect				
Group	3	0.43	0.20	20.05***
Test time	1	0.66	0.66	21.21***
Interaction effect				
Group × test time	3	0.32	0.11	19.86***

Note. *** $p < .001$

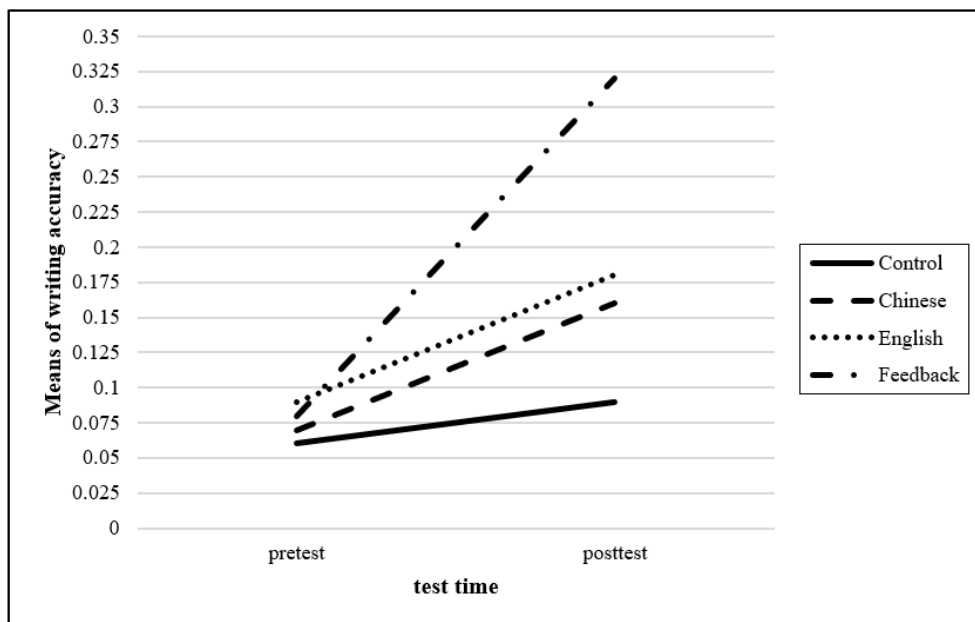


Figure 2. Interaction Curve Pattern of Writing Accuracy

Since interaction effect of group \times test time was significant, for the pretest writing accuracy, the researcher conducted one-way ANOVA after Levene's test, which showed insignificance ($p > .05$). The results of one-way ANOVA for the pretest showed that the difference in pretest writing accuracy was insignificant among the four groups ($p > .05$), ensuring a similar level of writing accuracy before the intervention.

To examine the progress from the pretest to the posttest in each group after the intervention, the researcher further conducted Paired Samples t -test using Bonferroni Adjustment technique (with p value reset to .0125 by dividing .05 with the number of contrast, i.e., 4) to avoid Type I error (Howell, 2009). The results, as shown in Table 7, revealed that the three intervention groups, i.e., the Feedback group and the English group and the Chinese group, made significant progress in posttest writing accuracy compared to the pretest ($p < .0125$), whereas the Control group did not ($p > .0125$). This indicated that

the three interventional programs were effective in enhancing writing accuracy among Taiwanese EFL college students.

Table 7. Difference between Pretest and Posttest in Writing Accuracy

Group	N	Test time	M	SD	t	effect size
Control	28	pretest	.06	.08	1.86	.35
		posttest	.09	.1		
Chinese	27	pretest	.07	.07	2.98**	.57
		posttest	.16	.15		
English	28	pretest	.09	.1	2.69*	.51
		posttest	.18	.16		
Feedback	28	pretest	.08	.08	6.83***	1.29
		posttest	.32	.21		

Note. * $p < .0125$; ** $p < .0025$; *** $p < .00025$

The result of Levene's test for writing accuracy posttest was significant ($F = 2.8$, $df1 = 3$, $df2 = 108$, $p = .043 < .05$), suggesting unequal variances among the four groups. Consequently, the researcher performed a one-way ANOVA via Welch ($F = 9.48$, $df1 = 3$, $df2 = 58.73$, $p = .000 < .001$), followed by Dunnett T3 for pair-wise comparisons to determine the sources of differences in the posttest (Chiu, 2006; Dunnett, 1980; Howell, 2009). Table 8 summarizes the results of posttest writing accuracy among the four groups. Post hoc pair-wise comparisons suggested that the Feedback group outperformed the Control, Chinese, and English groups in posttest writing accuracy, as assessed by the ratio of error-free T-units to total T-unit (EFT/T) after the intervention. These results indicate that integrating extensive reading with English journal writing and corrective feedback was more effective for improving writing accuracy than either regular classes or extensive reading with English or Chinese journal writing without feedback.

Table 8. Summary of Posttest Writing Accuracy among the Four Groups

Group	<i>N</i>	<i>M</i>	<i>SD</i>	Levene <i>F</i>	Welch <i>F</i>	Post Hoc
Control	28	.09	.1	2.8*	9.48***	Feedback > Control***
Chinese	27	.16	.15			> Chinese***
English	28	.18	.16			> English*
Feedback	28	.32	.21			

Note. * $p < .05$; *** $p < .001$

5. Discussion

5.1 Research Question 1

The findings demonstrated that both interventions—extensive reading combined with L2 English journal writing with and without teacher correction feedback—significantly enhanced writing fluency from pretest to posttest. The results echoed prior studies suggesting that extensive reading (Day & Bamford, 1998, 2002; Gass, 2017; Iswandari & Paradita, 2019; Lee & Krashen, 2002; Mason, 2004; Sakurai, 2017) and practice in English journal writing (Chang, 1996; Pham, Tran, & Nguyen, 2022; Yeh, 2006) are effective means to improve writing. The result, however, was partially different from Mason's (2003) finding, which reported that summary writing in both L1 Japanese and L2 English following extensive reading was effective. The results of the present study highlight evidence of the combined effect of extensive reading and L2 English journal writing on Taiwanese EFL university students' writing fluency.

Regarding writing accuracy, the study revealed that all three interventional programs significantly improved writing accuracy from the pretest to the posttest. This suggests that in EFL context with limited L2 input, incorporating extensive reading with journal writing in either L1 or L2 can positively influence writing accuracy. The possible underlying reasons for the findings are explored as follows.

First, extensive reading provided students with scaffolded materials to practice writing. The input from extensive reading (ER) serves as the basis on which learners could transfer to writing. Regular engagement with English materials outside of class partly enriched students' writing by using more words gleaned from reading, leading to increased word usage, and consequently improved writing fluency. Interestingly, ER's self-initiated and appealing qualities enabled the students to become more involved in their reading by inspiring them to explore the text from their own unique viewpoints. Additionally, the current study indirectly supported Hedgcock and Ferris's (2018) assertion that "extensive reading naturally exposes readers to naturally occurring phrasal and clausal patterns, repeated and alternate uses of lexical items and their spellings, and a range of other graphological features such as paragraphing, punctuation, and capitalization conventions", which in turn facilitates writing accuracy improvement.

Output triggers cognitive processes and leads to L2 acquisition (Leow & Suh, 2021; Swain, 2005). Producing output in L2 English journal writing after extensive reading provides learners with opportunities for hypothesis testing. They engaged in testing hypotheses by using linguistic expressions they had learned from reading in their output production and by identifying incorrect linguistic expressions from the teacher's feedback (Izumi & Bigelow, 2000; Leow & Suh, 2021; Swain, 2005).

Learners may become conscious of what they write and test linguistic hypotheses, which directs their focus to the language's syntactic features (Swain, 2005). As stated by Sholah (2019) and Zamel (1992), journal writing can enhance writing development and encourage an engaging reading experience. One of the key contributing elements to the feedback group's improved writing fluency was the students' increased ability to think deeply and produce more detail as a result of journal writing. This validates the claims of Nückles, Roelle, Glogger-Frey, Waldeyer and Renkl (2020) and Grabe and Kaplan (2014) that keeping a journal in the target language can help with idea generation and interesting source exploration.

Silva and Matsuda (2002) argue that putting certain writing skills into practice is beneficial as post-reading exercise, especially for beginning writers. Taiwanese university students benefited linguistically and cognitively from reading to writing because language

output via written language production was effective in coordinating and validating the language gained from the interaction between reading and writing. The results supported the perspectives offered by Silva and Matsuda (2002), and Olson (2021).

The findings of this study showed that the combination of extensive reading and L2 English journal writing, whether supplemented by teacher correction feedback or not, improved Taiwanese EFL university students' writing fluency. This provided some evidence to support the theoretical proposition that reading and writing require similar mental mechanisms and isomorphic knowledge (Fitzgerald & Shanahan, 2000).

Nevertheless, the transfer effect from reading to writing was only evident when extensive reading was integrated with L2 English journal writing. This indirectly supports the relationship between reading and English journal writing and echoes prior studies that suggest reading may contribute to L2 writing (Fitzgerald & Shanahan, 2000; Grabe & Zhang, 2013; Shen, 2009). The optimal method for improving Taiwanese EFL university students' writing fluency and maximizing the connection between reading and writing is to regularly include them in the integration of English writing and feedback through extensive reading.

For many years, L2 practice was believed to inherently engage learners in L2 competence-expanding processes as a facilitator of language learning. According to Batstone (1994), the noticed language goes through structuring and restructuring processes before the learner fully incorporates it into their present language hypothesis. Consistent L2 practice facilitates this transformation, leading to improved writing fluency.

The study also highlighted that extensive reading paired with journal writing in L1 effected writing fluency and accuracy differently. There has been debate in prior studies on whether writing in L2 or L1 would benefit L2 learners' writing. Some argued that writing in L2 could be more challenging than in L1, and thus hindered students' willingness to express their ideas freely. In contrast, others argue that journal writing in L1 might reduce students' opportunity to pressure themselves to practice L2 output. The present study demonstrated that while extensive reading with L1 journal writing did not lead to improvements in writing fluency, it did contribute to enhancements in writing accuracy. The finding partially differed from a study by Mason (2003) which reported that the combination of extensive

reading and writing summaries in L1 Japanese was more effective than doing so in English with or without teacher feedback.

Writing performance encompasses different aspects, which might display variations. The findings of the present study showed that extensive reading was positively related to writing improvement in fluency only when combined with subsequent L2 journal writing. However, accuracy improved when journal writing was conducted in either L1 or L2. The positive effect of extensive reading and L2 English journal writing offered partial support for the output hypothesis, highlighting the role of L2 output in writing improvement. The results implied that although practice of journal writing in L1 might hinder students' willingness to freely express ideas at the expense of writing fluency, it helped improve writing accuracy. One possible explanation might be that, in the Interactive-activation model (Conklin & Thul, 2023; Rumelhart & McClelland, 1981), there is bidirectional association among phonological, orthographic and semantic nodes. The semantic activation of the words in L1 journal writing might activate the form of the words gleaned from extensive reading, leading to better writing accuracy.

The researcher found that the explanations for the inconsistent relationship between reading and writing fluency across the groups engaging in journal writing in Chinese and English may not only be attributable to the language, but may also be due to other shared underlying theory-related aspects. The development of the participants' writing proficiency may be influenced by factors other than language production, such as conscious language acquisition utilizing L2 as a medium (Kirin, 2010).

5.2 Research Question 2

The result suggested that for writing fluency, extensive reading coupled with English journal writing, both with or without teacher corrective feedback, yielded a better effect than regular English class, and extensive reading with Chinese journal writing among Taiwanese EFL university students. Extensive reading and L2 English journal writing with or without teacher correction feedback yielded similar positive effect on writing fluency, suggesting a better facilitating route to enhance writing fluency than the other two groups.

For writing accuracy, only extensive reading with L2 English journal writing with

teacher correction feedback yielded a better effect than regular English class and extensive reading with journal writing in either L1 Chinese or L2 English.

Overall, regardless of fluency or accuracy, the integrated teacher correction feedback did provide a robust facilitating element for better writing performance in the extensive reading program. The facilitating effect of the incorporated teacher feedback was incongruent with Mason's study (2004). It was reported that extensive reading plus writing summaries in Japanese, in L2 English, and in L2 English with teacher feedback all benefitted similarly in reading comprehension and writing. In an EFL context, a lack of reading and writing experience is one of the difficulties learners have. The optimal effect of extensive reading with L2 English journal writing and teacher correction feedback echoed the study of Grabe and Zhang (2013). Their findings showed that to help students acquire academic literacy, instructors need to offer chances for learners to engage in reading and writing tasks. Such tasks not only build confidence and fluency but also benefit from consistent feedback on writing.

Further, as students put what they learned from extensive reading into L2 journal writing practice, part of the input could be made more perceptually salient, thus enhancing their awareness. Teachers' feedback also provided learners with opportunities to self-correct, reinforcing learning (Bitchener & Ferris, 2012; Ferris, 2012). Drawing on SLA theories, the effectiveness of corrective feedback has been justified based on the noticing hypothesis (Schmidt, 2012). Because the focus on form framework (CF) allows learners to participate in input analysis and compare their interlanguage to the provided input (Ellis, 2005), researchers have shown the significance of awareness and attention in language acquisition (Mole, 2008; Spada & Lightbown, 2019).

With the aid of declarative knowledge, or the stored recollection of specific pieces of information, corrective feedback allowed students more chances to reevaluate non-target structures received from long-term memory (Bitan & Karni, 2004). In particular, teachers' feedback, including comments on students' content, organization, grammar, spelling, and other suggestions, would help better enhance their awareness of writing subskills in subsequent new text writing.

When learners noticed discrepancies between their writing and the corrective feedback

offered, those who received CF paid closer attention to form when generating new texts (Loewen, 2004). Their fluency increased as a result of noticing and subsequent modified output (Izumi & Bigelow, 2000), demonstrating that CF aids in the mapping of accurate form and meaning (Bitchener & Ferris, 2012), and assisted learners in conveying their thoughts with more words for better writing fluency.

Furthermore, skill-acquisition theory (DeKeyser, 2007, 2020), which can be used to highlight the role of CF, postulates a gradual shift from declarative to procedural knowledge through meaningful practice across numerous trials. Declarative knowledge refers to the stored memory of specific facts of information, while procedural knowledge concerns the know-how exercised to perform a task or an activity (Anderson et al., 2004; Bitan & Karni, 2004). Corrective feedback enabled students to retrieve non-target components from long-term memory and analyze them again using declarative information within their working memory. This practice enables them to identify and correct writing mistakes, leading to more accurate and speedy processing of language use.

Through integrated corrective feedback, the declarative knowledge is made more accessible for the execution of a target language task. According to DeKeyser (2007), after only a few trials and practices, proceduralization, a transition from explicit knowledge to implicit skill execution, can be achieved (Anderson et al., 2004; DeKeyser, 2020). In the context of the feedback group, students had the opportunities to improve their skills by transforming the stored information via the instances of the teachers' CF. They gradually converted stored linguistic knowledge to procedural tacit knowledge in proceduralization, thus enhancing their writing performance compared to those who did not receive feedback.

Neurocognitive and neurolinguistic studies have also documented the beneficial effects of practice on L2 development (Suzuki, 2023; Ullman, 2005). Some scholars have modified the hypothesis to account for CF efficacy. According to the theory, CF is required to prevent the formulation of incorrect knowledge structures (Anderson & Schunn, 2000); as a result, giving students a chance to practice under controlled conditions during communicative interactions is beneficial in fostering their knowledge and for maximizing the practice effect by encouraging their self-correction (Lyster & Izquierdo, 2009; Morgan-Short & Ullman, 2023). Additionally, Silva and Matsuda (2002) assert that

learning some writing skills through practice in a second language is beneficial, particularly for novice writers. These partly helped explain why the Feedback group significantly surpassed the other three groups in writing accuracy.

The example below is a journal entry before revision, provided to illustrate the individual's writing fluency and how it improved through incorporating teacher feedback. The pre-revision sample is provided below:

"In this article, it mentions to the low salaries of part-time jobs, Students are hired with low salaries when they have their summer vacations. Despite of hiring with low salaries, many students still choose to do it, because they can also collect some extra cash and gain some working experience the hard of gaining money, accumulate some working experience for the job in future and have extra money to buy the things we wanted like cellphone, laptop, and computer. Some people have opposite ideals for this thing, they think that students should prepare for their homework or test in their vacations or they will have a bad grades at school, because working are not students' duty but the study are, so they have opposite ideal for this thing. I think if we can make balance between studies and part-time jobs, working in the vacations will be a good thing not only for students but for the people all over the world." (S17, error uncorrected draft).

In the prerevision sample, the student expressed his opinions about part-time jobs, but the writing was not well organized and lacked transitions. The teachers' feedback addressed the content, the organization, use of transitions, and clarity of language as follows:

"To improve the organization, consider dividing the article into clear sections that focus on specific points, make it easier for the reader to follow the flow of the argument. Secondly, there were instances where one point jumped to another without sufficient transition or structure. Please improve the transition by using cohesive devices such as however, furthermore, if, to conclude, etc. in the writing. Additionally, there is room for improvement in the clarity of expression and language usage. For instance, 'the hard of gaining money' is unclear and could be

rewritten for better clarity; the sentence 'accumulate some working experience for the job in future' could be clearer by rephrasing it as 'gain work experience that will be useful for future job opportunities.' To improve your writing, use specific, and accurate language that conveys the intended meaning."

The student revised the draft based on the feedback. The revision was shown as below:

"In this article, the author discusses the topic of low salaries for part-time jobs that students take up during their summer vacations. Despite the low pay, many students still choose to work during their vacations because it allows them to gain valuable work experience, and earn extra cash for purchasing desired items such as cellphones, laptops, and computers.

However, some people believe that students should prepare for their homework, tests, and assignments during their vacations. While it is true that their school performance should not be sacrificed, we think that if students can find a balance between studies and part-time jobs, working during their vacations can be a good experience for them. If students can do so, they can develop important time-management and skills and earn extra money and gain work experiences.

To conclude, I think working part-time jobs during summer vacations can be a good thing not only for students but for people all over the world." (S17, revised draft).

After revising, the student's writing fluency was markedly improved, with ideas expressed more effectively after better identifying the problems in meaning presentation. Initially, some original expressions were simplified that meaning was hampered, or sentences were too long and unclear. In the revision, they rewrote one sentence into several by using cohesive devices and supplementing illustrative information for each argument based on teacher's comments. The progress observed in the feedback group in writing fluency can be attributed to several contributing factors: exposure to reading and writing in the extensive reading program, and teacher constructive feedback. By engaging with a diverse range of texts, practicing writing regularly, and receiving constructive feedback, the

students in the feedback group were able to refine their writing skills over time, resulting in improved writing fluency in the posttest.

Another individual journal writing entry is presented below in both its pre-revision and post-revision forms to illustrate progress in writing accuracy. Teacher's feedback and corrections on errors were also provided to show how it helped improve the individual writing accuracy in the revision.

"I have seen in this magazine like this the article about autopilot car. Then think this is something that is unlikely to occur so fast. When I saw this article, I was surprised, when you have such an outstanding technical now." (S2, error uncorrected draft)

The teacher identified errors and provided feedback in the paragraph, including grammatical errors, e.g., a missing article before "autopilot car"; a missing subject and incorrect verb tense, e.g., "Then think" rather than "Then, I thought"; lack of consistency in verb tense, e.g., "when you have such an outstanding technical now" rather than "when you had such an outstanding technical now"; punctuation typos, e.g., a missing period after "autopilot car"; a sentence fragment which did not express complete thought, e.g., "when you have such an outstanding technical now"; mistakes in part of speech, e.g., "technical" rather than "technology"; improper use of vocabulary, e.g., "see this article" instead of "read this article."

The revised entry is as follows:

"I have seen an article in this magazine about autopilot cars. Then I thought that this was something that was unlikely to happen so fast. When I read this article, I was surprised to see such outstanding technology now available." (S2, error corrected draft)

After revision, the student demonstrated a notable improvement in writing accuracy. The writing was almost free of grammatical and punctuation mistakes. By practicing writing skills in L2 and receiving feedback on their writing over time, students improved their accuracy in the posttest.

It is also important to note that extensive reading with L2 English journal writing was more effective on writing fluency than when paired with L1 Chinese journal writing. This implied that repeated practice with L2 journal writing tasks played a more facilitating role (DeKeyser, 2007) than with L1 journal writing task for Taiwanese EFL students' writing fluency. One of the reasons might be that after extensive reading, Taiwanese EFL students repeatedly practiced L2 language use to express meaning and thought for communication in their journal writing and before the next journal entry. They became more cognitively active and familiar with linguistic expressions incorporated into active repertoire of mental dictionary, leading to better fluency. Similar to the study of Lai (1993), this enhancement in writing readiness is consistent with other research like Hafiz and Tudor (1990).

In general, the most optimal effectiveness of extensive reading with English journal writing, particularly, when enhanced with teacher corrective feedback, aligns with the cognitive-interactionist perspective in SLA theory. From a cognitive-interactionist perspective (Anderson, 2005; Gass, 1997; Long, 1996; Ortega & DeKeyser, 2007; Robinson, 2001; Swain, 2005), language learning is viewed as the "interaction of both learner-internal (e.g., attention to form) and learner-external factors (e.g., a task design that offers essential L2 input and feedback) (Ortega & DeKeyser, 2007)."

While extensive reading provides students with exposure to L2 input, engaging them in L2 English journal writing task before writing new text offered them opportunities to attend to form and engage in meaningful use of the L2. When students used language in meaning-making acts of communicative, interactive practice of journal writing, the ability to produce more words increased as they further activated and proceeded the L2 learning process (Ortega & DeKeyser, 2007). Based on the interaction hypothesis (Gass, 1997; Long, 1996), interaction with teachers via feedback further helped students better connect L2 form and meaning. In particular, when students write new text by incorporating some of the interactional feedback from the teacher, i.e., often referred to as uptake, learners gain more information about particular parts of the language in their modified output. As Gass has pointed out, attention primes language to be inserted into a developing interlanguage system. In addition to extensive reading, the productive activities provided during communicative, interactional practice in English journal writing, enriched by teacher

feedback, offered optimal opportunities for communicative connection and promotes quicker development of writing fluency and accuracy. Such an interactive and cognitively engaging process supports the nature of language learning, as it facilitates both cognitive understanding and linguistic development (Gass, 1997; Long, 1996; Robinson, 2001).

6. Conclusion, limitations and suggestions for future studies

The finding of the study was that extensive reading combined with English journal writing, with or without teacher corrective feedback, significantly enhanced posttest writing fluency compared to the pretest. Both programs produced a substantially better effect on posttest writing fluency than the regular class and extensive reading paired with Chinese journal writing. In terms of writing accuracy, while all three interventional programs significantly improved posttest writing accuracy, extensive reading with English journal writing and teacher corrective feedback was more effective than the regular class, and extensive reading with Chinese or English journal writing without feedback. The findings demonstrated the connection between reading and writing for L2 learners by integrating extensive reading, journal writing, and feedback exercises and provided valuable pedagogical implications. For a better effect on writing accuracy, it is recommended that teachers incorporate feedback with extensive reading and English journal writing when implementing an ER and writing program.

Despite these findings, there were some limitations. First, future studies could recruit additional experimental groups receiving single treatments to further identify the effects of each variable. Second, as this study was conducted in a tertiary level EFL college education setting with students' TOEIC scores averaging around 480, the generalizability of the findings to other student populations and educational settings remains to be verified (Grabe, 2000). Third, there is a possibility that different genres of journal writing, which requires more advanced writing skills, might lead to different results. It would be interesting to investigate use of expository or persuasive journal writing for students with more advanced L2 proficiency. Fourth, future case studies could examine variations of composing process and linguistic structures in writings by students at different levels. Fifth, although the

students were in the same course, the analytic ratings showed that their writing proficiency varied, indicating each student has various strengths and limitations. Further qualitative studies addressing individual differences might uncover additional influences (Larsen-Freeman, 2006). Last, acquisition of a language is a delicate process, which might involve language loss over time (Yamazaki, 1996). Future studies could incorporate a delayed posttest in the measure to examine the retention effect.

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