



The Application of Translanguaging in an English for Specific Purposes Writing Course

跨語言實踐在專業英文寫作課程中的應用
Fay Chen¹ · Shu-Chiao Tsai² · Wenli Tsou¹

Received: 28 June 2018 / Revised: 6 December 2018 / Accepted: 10 December 2018 /
Published online: 4 January 2019
© National Taiwan Normal University 2019

Abstract

The current study examines how translanguaging contributes to college students' English for Specific Purposes (ESP) writing in Taiwan, and how students' multiple linguistic resources, including home languages, target language, and online tools, are utilized to produce quality writing. In this study, college students, aided by online translation software, underwent a translingual writing process that involved tasks from drafting in Chinese, drafting in English, online translation, to revision. The text was then analyzed with an assessment rubric to identify areas of improvement. Comparison of text indicates that translanguaging is shown to have synergistically helped students leverage their multiple linguistic resources to convey more information, express more ideas, while achieving a wider use of general, academic, and idea words. Analysis of the translanguaging writing process also indicates that students engaged in more writing steps, from pre-writing, reproducing, online translation, editing, to revising. Implications from the study indicate multiple benefits from creating a learning environment where translanguaging are encouraged.

✉ Wenli Tsou
wtsou@mail.ncku.edu.tw

Fay Chen
faychen@mail.ncku.edu.tw

Shu-Chiao Tsai
achiao@cc.kuas.edu.tw

¹ National Cheng Kung University, Tainan, Taiwan

² National Kaohsiung University of Science and Technology, Kaohsiung, Taiwan

摘要

本研究探討跨語言實踐對台灣大學生專業英文 (ESP) 寫作的影響, 以及學生如何利用多種語言資源 (包括母語、目標語言、線上工具) 來提升寫作品質。在這項研究中, 大學生在線上翻譯軟體的幫助下, 進行了跨語言實踐寫作。過程包括中文寫作、英文寫作、線上翻譯、英文稿修訂等任務。研究人員將學生完成的作文進行評估。結果顯示, 跨語言實踐有助於學生利用多種語言資源來傳達信, 表達更深入想法, 同時更廣泛地使用一般、學術和專業詞語。本研究結果也顯示, 學生在跨語言實踐的寫作過程中能執行更多的寫作任務, 包括進行預先寫作、轉譯、線上翻譯、編輯到修改等步驟。由此可見, 跨語言實踐的學習環境可為學生的專業英文寫作帶來多重好處。

Keywords Translanguaging · ESP writing · L2 writing · Higher education · Online translation

關鍵詞 跨語言實踐 · 專業英文寫作 · 第二語言寫作 · 高等教育 · 線上翻譯

Introduction

In recent years, with multicultural classrooms becoming more common, the notion of translanguaging as a new paradigm has brought new insight into how classroom languages are viewed and often with profound impact on the practice of language teaching and research [3, 9, 20]. Translanguaging refers to the ability of multilingual speakers to utilize and integrate diverse language resources to create their own voice [1]. It challenges the traditional belief that languages are separate entities, each with its prescribed and fixed norms. Canagarajah [3] argues that, throughout history and common among speakers from both monolingual and multilingual backgrounds, instances of translanguaging can be observed. Moreover, all speakers can be considered translanguals to some degree, in that they freely mesh semiotic resources from different languages and symbol systems in situated practice to construct meaning. Canagarajah's practice-based analysis has shown that language norms are being continuously negotiated and redefined in spoken and written communication.

This new understanding has implications in language teaching, especially in academic writing, where negotiation strategies are deployed not only to clarify information but also to co-construct meanings in a way to ensure individual voices are more effectively heard [1–3]. Related research has also shown that translanguaging pedagogies are beneficial on learning all four language skills [1, 3, 10].

This paper reports on a project that created an English for Specific Purposes (ESP) learning environment where translanguaging was implemented and college students were encouraged to use multiple linguistic resources in second-language (L2) writing. College students in Taiwan normally would have received about 10 years of English language education by the time they are a sophomore student (from elementary school, high schools, to first-year college English); however, much of their learning is restricted to general academic English, not business English. Thus, teaching ESP students to access business knowledge in their home or school language (L1) is much needed so that they can produce better essays in English.

In the present study, students' translanguaging was aided with online translation software, a valuable tool for students because it allows students to quickly access their

professional knowledge in L1 and learn new vocabulary, phrases, and usage as needed. Online translators are efficient because they can quickly translate the entire essay, and often provide useful phrases so that students do not have to look up in the dictionary for collocated words.

Research has shown that online tools such as Google Translate (GT) helped students on their ESP writing [21]. In the study, students were asked to write an essay explaining why exporters in Taiwan should attend international trade shows. The students were first asked to draft a response in Chinese and a draft in English. They then machine translated the Chinese text into English, and then used the online translation to produce a final essay in English.

Comparing the quality of students' draft and the final version, Tsai [21, 22] found that the final version, aided by online translation, was higher in quality. The text contained more K1 (the most frequent 1000 words), K2 (the second most frequent thousand words), AWL (academic word list), and fewer spelling or grammatical errors. K1 and K2 refer to the General Service List developed by West [26]. These 2000 words form the basic vocabulary which learners are expected to have before starting to learn academic vocabulary. AWL refers to the 570-word families from an academic corpus compiled by Coxhead [6], which covers 28 subject areas.

Based on the same research vein, the present study investigated how translanguaging could be facilitated by GT to help students access multiple linguistic resources. The researchers examined the writing of the higher-performing students (henceforth the high group) and the lower-performing students (the low group) from Tsai's study [21, 22]. The following research questions were explored:

1. How did translanguaging help students in their English writing?
2. How did the high and low groups differ in their use of revision strategies?
3. What are the steps involved in a tranlingual writing process?

Translanguaging and the L2 Writing Process

Translanguaging describes a practice where speakers can leverage their multiple language resources as an integrated system to achieve a communicative or learning task [9]. In classroom practice, translanguaging can be used (1) as a scaffold to help emergent bilinguals, or multilingual students, learn an additional language, and (2) to cultivate students' bilingualism or multilingualism [20]. Accessing prior knowledge in L1 is an important resource for students who write in an additional language [1, 23, 24]. Studies have shown that L1 and L2 are inevitably intertwined in the mind of English as a foreign language (EFL) writers and this translanguaging activity should be harnessed [5, 7, 19, 25]. Recently, Gunnarsson, Housen, van de Weijer, and Kallkvist's study [12] on secondary school students in Sweden shows that students with different cultural backgrounds, recent immigrants included, tended to activate Swedish (students' home or school language) as the language of thought while engaging with an essay task in English (the target language). The finding is similar to the results obtained by Wang and Wen [24] and Tullock and Fernandez-Villanueva [23], in that students are more likely to access their home or school language when they engage in a writing task in a non-native language. The reasons for the more frequent use of the home or school language is likely because it is the medium of instruction at the school and the language that students speak at home and thus have a high proficiency level.

To help students access their language resources, Gunnarsson et al. [12] suggested strategies such as pre-writing using all languages and practicing writing for a bilingual audience to activate multilingual resources. The researchers also encouraged students to brainstorm on the board with bilingual writing partners using different languages, make connections between words by using cognates and engage in language comparisons.

Online Translation and ESP Writing

The rapid speed in which digital technologies have developed has meant that it is difficult to develop an analytical framework to explore the complex relationship between digital and writing practices [15]; however, discussion on the impact of the digital revolution on academic writing has continued to receive great attention [13, 16, 17]. Digital tools are shown to have contributed to the actual production of the writing as well as interactive activities surrounding the writing process. For example, online tools have improved the efficiency of collaborative writing, with cloud-based collaborative writing software to support the writing practice, and social media such as Skype, Twitter, SlideShare, etc. to facilitate communicative and consulting activities [11, 14].

Studies on digital tools have also informed recent discussion on meaning-making and translanguaging [4, 15]. In EFL classrooms, writing in a second language is a challenging task for students; similarly, teachers spend many laborious hours on giving feedback. With technology, online writing tools such as digital dictionaries and translation software can help students write in a non-native language. Nowadays, the Google Neural Machine Translation (GNMT) system, introduced in November 2016, is being widely used in Chinese-to-English machine translations, accounting for around 18 million translations per day [18]. A recent study found significant improvement in students' use of articles after receiving training on Google search techniques [13]. Similarly, recent research has focused on training EFL students to use Google to identify authentic language patterns and thus led to learner autonomy [17].

The Study

Participants and Background

This study investigated the writing of 21 second-year college English majors at a national science and technology university in Taiwan. The student samples were selected from the participants' in Tsai's studies [21, 22]. The original group of students ($N=44$) were assessed by an online TOEIC-like test, with a total score of 990. The TOEIC mean for these students was 694, a level between B1 (equivalent to TOEIC 550) and B2 (equivalent to TOEIC 850) of the Common European Framework of Reference for Languages (CEFR). The present study examined the text produced by the higher-performing ($N=11$) and lower-performing students ($N=10$) in an attempt to understand how students utilized translanguaging resources in the writing process. These students' TOEIC scores are presented in Tables 1 and 2. The range of the high group is between 820 and 760, whereas the low group is between 639 and 576. According to the Education Testing Service (2015, https://www.ets.org/s/toEIC/pdf/toEIC_cef_mapping_flyer.pdf), students in our studies are between B1 and B2 levels.

Table 1 TOEIC scores and wordcounts of the high group's different versions

High group (<i>N</i> = 11)	TOEIC scores	Drafts	GT text	Revisions	Difference between drafts and revisions	
					Wordcount	Percentage
H1	820	69	74	72	3	4
H2	820	134	137	138	4	3
H3	819	144	159	163	19	13
H4	801	156	170	180	24	15
H5	783	126	154	140	14	11
H6	783	83	87	84	1	1
H7	774	62	198	158	96	155
H8	774	119	124	154	35	29
H9	774	130	125	106	−24	−18
H10	765	71	126	70	−1	−1
H11	760	172	213	247	75	44
Average wordcount		115	137	137	22	19

Procedures

In the study, college students were given the following assignment: *Write a composition mentioning the importance or advantages of participating in an international trade fair for a Taiwanese trading company.* Students undertook four tasks to create four different texts:

- Task 1 Write a draft in Chinese, 30 min (the Chinese text)
- Task 2 Write a draft in English, 30 min (the Draft)
- Task 3 Use GT to produce online translation (the GT text)
- Task 4 Use the GT text to revise the Draft, 10 min (the Revision)

The four writing tasks were conducted in the university's multimedia laboratory. Students composed their own compositions on individual computers. The tasks were supervised by the teacher-as-researcher (Tsai, a co-author of the present study). To solicit better effort, students' essays were graded as quizzes.

Research Design

To evaluate the quality of writing, the CLASS evaluation chart was used as a reference [8]. The chart was developed for use at California State University, Fullerton for business communication. As its name CLASS suggests, the chart consists of five criteria: content, literacy, audience, strategy, and style. Table 3 identifies the key features and describes the top ranking for each item. This chart was selected because it was used to evaluate business communication and thus related to the ESP course surveyed in this study. Although the chart includes five criteria, only three of them were used in this study. The text was not assessed for *audience* and *strategy* because the writing instruction was straightforward,

Table 2 TOEIC scores and wordcount of the low group's different versions

Low group (<i>N</i> = 10)	TOEIC score	Drafts	GT text	Revisions	Difference between drafts and revisions	
					Wordcount	Percentage
L1	639	85	106	75	– 10	– 12
L2	639	78	159	129	51	65
L3	639	115	116	112	– 3	– 3
L4	621	102	134	112	10	10
L5	621	97	120	91	– 6	– 6
L6	612	80	77	82	2	3%
L7	585	97	88	85	– 12	– 12
L8	585	73	88	83	10	14
L9	585	240	190	200	– 40	– 17
L10	576	92	123	114	22	24
Average wordcount		106	120	108	2	0

asking students to explain the reasons for participating in international exhibitions or describe the benefits which trading companies can expect from attending trade shows. Content from students' essays indicates that they understood the intended readers as trading companies who look to expand their businesses. Moreover, the short lengths of essays and time limit meant that students only had time to briefly list the benefits. There were not enough time to engage in more sophisticated tasks such as strategic planning, elaborated idea development, persuasive argument, or appealing to emotions.

Table 3 Assessment rubrics: the CLASS chart

Items	Description of top grades	Evaluation methods for the current study
1. Content (clarity, completeness)	Develops and supports ideas using well-chosen examples and creative details	Compared drafts and revision to identify additional information from L1
2. Literacy (grammar, spelling, punctuation)	Makes virtually no grammatical or syntactical errors. Establishes credibility with the audience	Identified misspelling and grammatical errors corrected in the revisions
3. Audience (attitude, awareness of reader's needs)	Reader-focused; addresses readers' questions and/or objections; creates goodwill	Not evaluated
4. Strategy (purpose, effectiveness of approach, professionalism, means used)	Adopts strategy to achieve desired outcome; clearly defines purpose and uses logical and/or emotional effectively	Not evaluated
5. Style (tone, word choice)	Demonstrates a sophisticated grasp of language; writes in a fluid manner; varies syntax and vocabulary; uses original language	Analyzed vocabulary profile to identify academic and business words in the text

Table 3 briefly describes the CLASS criteria and how each item was evaluated in this study. First, content improvement was determined by whether students accessed additional prior knowledge in L1. This was done by comparing participants' drafts, the GT text, and revisions. The content not in the drafts but are in revisions were considered additional content gained with the help of the online tool. To assess the quality of literacy, comparison of drafts and revisions were made to identify errors which were corrected in the revision.

To assess style, the online tool Vocabulary Profiler (<http://www4.caes.hku.hk/vocabulary/profile.htm>) was used to identify words from the K1, K2, AWL, and other content words or business vocabulary. It was assumed that the more academic and business words were identified, the more professional the writing was.

Results and Discussion

To facilitate analysis, students' writing information is compiled and word count for each text is presented in Table 1 (the high group) and Table 2 (the low group). On average, the high group produced longer essays than the low group. This is the same for all three versions: Drafts (high group 115 versus low group 106 words), GT text (137 versus 120), and Revisions (137 versus 108). The largest difference in wordcount is observed in the Revision category, showing that the high group's revised text is more than 20% longer than that of the low group, suggesting that the high group added more new content to the revision.

The two tables also indicate that students' GT versions are longer than their Drafts, meaning that students' Chinese text contains more information than the drafts in English. This is the same for both the high group (Drafts = 115 versus GT = 137 words) and the low group (Drafts = 106 versus GT = 120). Interestingly, the revised text does not reflect the same increase in length: the high group increased their revised text by 22 words (Drafts = 115 versus Revisions = 137), whereas the low group increased by two words (Drafts = 106 versus Revisions = 108). Detailed analysis of these preliminary findings is discussed in research question 2.

To answer the first research question, on how translanguaging helped students in their English writing, students' compositions were analyzed with the CLASS chart (Table 3). Comparison between students' drafts, GT, and revised versions shows that the use of translanguaging has helped both groups of students to improve in three areas: content, literacy, and style. Specifically, students enriched content by leveraging prior knowledge in L1 to convey more information in the revisions, improved literacy with correct sentence structures, and achieved a more professional style with more academic and business vocabulary.

Enriched Content with Prior Knowledge

The data shows that students' revisions improved on the content aspect with the help of translanguaging. Students' revisions contain information which was in the Chinese text but not in the drafts, suggesting that students either did not have enough time to write a longer draft or did not know how to express in English some of their L1 knowledge. Data analysis showed that students from both the high and low tiers adopted at least one to three complete sentences from the GT text in the revisions. The high group added an average of

Table 4 Example 1: student H7 integrated the GT text in the revision

Parts	Student H7's revision	Sources of the text
1	The reason why Taiwan merchants want to participate in international exhibitions is because is that they can not only find their potential customers but also have the chance to disseminate to the world.	In draft
2	In my view, Taiwan is still an export-oriented country, but despite the progress of our technology, how to show our products to customers is a big focus. For instance, if some companies are just looking for a Taiwanese company which had successfully developed the technology, but he does not know that the company is in Taiwan, then he finally found this company in an exhibition and decided to work with it. This effect of the cooperation could not only raise the Taiwan economic but could also propaganda Taiwan in the world.	Added from GT (90 words)
3	And because of the political situation to China that Taiwan is facing in recent years, it is very important for Taiwan's company to continue trading with other countries, in order to maintain the status quo.	In draft

22 words per essay (Table 1). In particular, three students from the high group (H4, H7, and H11) increased the lengths of their revisions by 24, 96, 75 words respectively. On the other hand, although data from the low group show only a small increase in wordcount for the group average, five students increased the lengths of the revisions (Table 4), suggesting that both the high and low groups utilized the GT text in the revision.

Taking student H7 as an example, integrating the GT text enabled the student to elaborate on the discussion, explaining that trade show participation has the dual benefits of raising the profiles of companies and contributing to the growth of Taiwan's economy (Table 4). Similarly, student L2's revised text includes a new clause at the end of the first sentence and a new complete second sentence. With the addition, student L2 discussed opportunities for international cooperation (Table 5). The examples show that GT helped the high and low groups integrate their L1 knowledge to compositions in English. Students' revisions were enriched in content, with added discussion on benefits for Taiwan's economy in general and Taiwanese companies in particular.

Improved Literacy with Better Word Choices and Accurate Sentence Structure

On the accuracy of language, data show that the online translation has helped both the high and low groups to enhance writing skills by demonstrating correct sentence

Table 5 Example 2: student L2 integrated the GT text in the revision

Parts	Student L2's revision	Sources of the text
1	As a result, it's very important that trade company from Taiwan to participate the oversea exhibition, the purpose is not only to learn how foreign traders' technology; but also, our country's traders can have a chance to let other businessmen see our strength,	In draft
2	so that other countries also see Taiwan is progressing. In addition, it may be able to reach out to some foreign brands and get cooperation opportunities or invite them to come to Taiwan to participate in the exhibition, so that they will know—foreign can, Taiwan can.	Added from GT (47 words)

Table 6 Examples 3 to 5: improved language accuracy

Drafts	Revisions	Comments on improved language accuracy
Example 3 [student H8] [W]e can imitate other country's operat mode to improve the flaws in Taiwan industry.	[W]e can learn from and follow the example of foreign business model to explore the current industry in Taiwan defects.	Student H8 clarified his/her meaning with phrases <i>learn from and follow the example of foreign business model</i> .
Example 4 (student H9) We can promote the qualities of our lives and let the best side showed to others by MICE, too.	We can also improve the quality of life by this industry, showing our best side out.	Student H9's revision has the correct phrases <i>improve quality and show our best side</i> .
Example 5 [student L8] Exhibiting at overseas can expand horizons, and learn the technology and culture from other countries.	Participating in foreign exhibitions make Taiwanese enterprises expand their horizons, learn the technology and cultures, and so on.	Student L8's revision correctly shows a sentence structure that indicates Taiwanese enterprises are to expand horizons and learn the technology.

structures and suggesting appropriate phrases and collocations. In Examples 3 to 5 (Table 6), students' revisions contain more collocations and revised sentence structures that make the language more accessible.

The study also found that many participants did not correctly use the acronym MICE, which is a collective term for four functions: meetings, incentives, conventions, and exhibitions. It covers a vast range of activities from incentive tourism to the meeting and events industry. However, in the context of this essay assignment, in which students were asked to discuss the benefits of attending conventions and exhibition functions, data show that students often misused MICE in places where specific terms such as *conventions*, *exhibitions*, or *trade shows* should have been used. In Example 6, student L3 replaced MICE with the correct term *exhibition* in the revision, suggesting that GT helped bring awareness to the difference between these two terms. Students' writing samples have shown that GT helped students edit their own writing on the word, collocation, and sentence levels. Used properly, GT can be a convenient and useful self-learning tool for L2 compositions.

(Example 6 Draft) In the process of communication that is at the MICE, the trading company will also make more people know the culture in Taiwan.

(Revision) In the course of the exhibition, the trading company can promote the culture of Taiwan to the partners of various countries, so that more people know Taiwan.

Achieved a Professional Style with More Use of Academic and Business Vocabulary

To assess style, students' writing samples were analyzed with the Vocabulary Profiler software. According to the results (Table 7), the high group used more AWL and content/business words in the drafts than the low group (in absolute numbers AWL H = 67 versus L = 42; other content/business H = 39 versus L = 19).

Table 7 High versus low student/drafts versus revisions (word type comparison)

	High (N = 11)			Low (N = 10)		
	Drafts	Revisions	+/-	Drafts	Revisions	+/-
K1 words	303	336	33	245	241	-4
K2 words	35	36	1	31	32	1
AWL words	67	91	24	42	46	4
Other words	39	50	11	19	29	10
Total words	444	513	69	337	348	11
Per essay	40.4	46.6	6	33.7	34.8	1.1

In the revisions, the high group also used more new AWL and content/business words than the low group (in net changes AWL H = 24 versus L = 4; other content/business H = 11 versus L = 10).

However, the net change numbers tell an incomplete story. As Table 8 indicates, the high group used 32 new AWL words, whereas the low group adopted 19 new academic words in the revisions. Similarly, both groups included more content/business words in the revisions. Thus, data show that both the high and low groups benefited from the GT text and were able to produce more professional essays (Table 8).

To illustrate how students utilized the online translation, Example 7 (Table 9) shows that, although student H6 from the high group wrote the same number of words in the draft and revision, vocabulary suggested by the GT text was used in the revision. The revision now contains a more professional style with collocations such as *drive the economy growth*, *participating international exhibition*, *[be] confined to existing customers*, and *make cross-border cooperation*. While the Revision contains grammatical errors, the new collocations added to the quality of the final product.

Example 8 shows that student L3 (from the low group) also benefitted on the vocabulary and phrasal level (Table 10). The revision includes words such as *exposure*, *promote*, and *economic development*, all these words being vocabulary from the business writing genre. More specifically, *when more and more people know Taiwan* (L3 Draft) was edited to become *with the higher exposure of Taiwan* in the revision. Moreover, *the economy will increase* was revised to *it will promote economic*

Table 8 High vs. low student/draft vs. revision (words unique in each version)

	High (N = 11)			Low (N = 10)		
	Words only in draft	Words only in rev	+/-	Words only in draft	Words only in rev	+/-
AWL words	8	32	24	15	19	4
Other words	7	18	11	9	19	10
Total	15	50	35	24	38	14

Table 9 Example 7: student H6's revision reflects a more professional style

H6 draft	H6 revision	Comments on style
1. [...], it helps the economy growth	[...], it will be able to drive the economy growth	T6 used the verb <i>drive</i> and the collocation <i>drive + growth</i> . The action verb <i>drive</i> makes the style more professional. The text could have been further edited to <i>drive the economic growth</i> .
2. [...] joining foreign exhibitions...	[...] participating international exhibitions...	The verb <i>participate</i> is more descriptive and formal than <i>join</i> , which is more often used in the context of becoming a player of a team or a member of an organization. In addition, the adjective <i>international</i> is more appropriate (here referring to multiple countries) than <i>foreign</i> , which is commonly used to contrast with the home country. The text could be further edited to <i>participating in international exhibitions...</i>
3. [...] confined to same customers...	[...] confined to existing customers...	The adjective <i>existing</i> is more descriptive and accurate in referring to customers a company already has.
4. [...] They can also do crossover...	[...] meeting other corporations can make cross-border cooperation so that...	The verbal phrase <i>make cross-border cooperation</i> is more descriptive than <i>do crossover</i> , which has different meanings in different contexts.

development. Example 9 presents another student L8's text and shows that more descriptive adjectives were adopted in the revision (Table 11).

Generally speaking, using the CLASS chart as an evaluation tool, data show that the GT text has helped students enrich the content, present a more professional style, and

Table 10 Example 8: student L3's revision reflects a more professional style

L3 draft	L3 revision	Comments on style
1. When more and more people know Taiwan, the economy will increase.	With the higher <i>exposure</i> of Taiwan, it will <i>promote economic development</i> .	Student L3 used economic vocabularies such as <i>exposure</i> , <i>promote</i> , <i>economic development</i> suggested by GT.
2. No matter the trading companies or other companies are one of good benefit.	In conclusion, <i>participating in the exhibition</i> is a <i>great advantage</i> for every business.	L3's text changed from <i>trading companies or other companies</i> (Draft), <i>all businesses and trading companies</i> (GT) to <i>every business</i> (Revision). L3's language changed from <i>one of good benefit</i> (Draft), <i>a major benefit</i> (GT), to <i>a great advantage</i> (Revision). L3 added a grammatical subject <i>participating in the exhibition</i> . The original sentence (<i>No matter the...</i>) is grammatically incomplete. L3 also used signaling language <i>in conclusion</i> to express the writer's intent and thus making the text more accessible to readers.

Table 11 Example 9: student L8's revision contains more descriptive adjectives

L8 draft	L8 revision	Comments on style
MICE is a new and necessary industry for Taiwan.	MICE becomes an emerging and indispensable industry for Taiwan.	Student L8 adopted the more descriptive adjectives, <i>emerging</i> and <i>indispensable</i> , which the online translator provided based on the Chinese text. 展產業對於台灣來說是一個新興、不可或缺的產業。

increase credibility with fewer grammatical or syntactical errors. The use of online translation contributes to the writing quality in different ways: offering more content from their L1 knowledge, suggesting appropriate words, phrases, and language expressions, and modeling appropriate sentence formation and structures. Data show that GT helped the high and low groups; however, how these two groups were benefited will be discussed in the second research question.

Comparison of Revision Strategy Use Between the High and Low Groups

To answer the second research question, on how the high and low groups differed in their revision strategies, findings from the comparison (Tables 7 and 8) are further elaborated as follows. Discussion of the first research question already established that the high group produced longer texts and used more AWL and other idea words than the low group in both drafts and revisions (Table 7). The high group also added more AWL and content/business words in the revisions comparing to the low group. The list of new words is compiled in Tables 12 and 13, showing that the online software helped both the high and low students introduce a wide range of academic and business vocabulary in their writing.

However, the two groups differed in how they revised the text. The high group not only added more new words in the revisions, but they also replaced fewer words from the drafts. Specifically, the high group replaced 12% (8/67) of AWL in the drafts, while the low group replaced 36% (15/42). Similarly, the high group replaced 18% (7/39) and the low group 47% (9/19) of the content/business words from the drafts. Academic words replaced by the low group are listed in Table 14.

A possible reason for the difference is that the high group could read faster and thus had more time to integrate new words in the revision. The integration meant that the

Table 12 AWL added in revisions by the high and low groups

Groups	New AWL added in revisions
High group (32 words)	Access achieve affect aspect attach aware concepts conference contribute conventional crucial data despite diversification elimination environmental evaluation export finally incapable instance maintain oriented publications publish reinforce resource status topics visibility vision visual
Low group (19 words)	Access achieved achievements capacity contact contacts eliminated emerging enhance major perspective publication publish status survival technical technological visibility vision

Table 13 Other content/business words added in revisions

Groups	New content/business words in revisions
High group (18 words)	Accelerate China competitors considerate cope crisis expositions fairs impression monetary prevalence propaganda strengths striving technologies unilateral vigilance weaknesses
Low group (19 words)	Affirmation brands enterprises era etc. exhibitors foundry globalized inseparable landscape pace pave profile showcase sponsorship talent technologies transactions upstream

high group retained more words from the drafts and also added new words. On the other hand, the low group, confined with poorer reading skills and time limit, only had time to copy directly from the online translation without the rewriting. As a result, many words from the drafts were replaced. The writing processes of the high and low groups are discussed further in the third research question.

Describing the Translingual Writing Process

To answer the third research question (steps involved in the translingual writing process), this study examined the four tasks performed by students to identify translanguaging employed by students. As described earlier in the text, the tasks were (1) write a Chinese text, (2) write a draft in English, (3) produce the GT text, and (4) revise the drafts. To facilitate discussion, these four tasks were compared to Wang and Wen's [24] composing process, which identified five steps: task-examination, idea-generation, idea-organization, process-control, and text-generation. Figure 1 describes the relation among participants' writing tasks in this study (Tasks 1 to 4), Wang and Wen's composing process (Steps 1 to 5) and the two additional steps identified in this study (Steps 6 and 7). As the following discussion will show, these last two steps inform students' use of the translanguaging, and how translanguaging differs from translation.

Data analysis indicates that in task 1 (writing in Chinese), students performed all five steps observed by Wang and Wen [24]. However, in tasks 2 and 4, when the online translation was used to assist students' L2 composition, the current study identified two more steps employed by student writers: step 6 (L2 text-reproduction) in task 2 and step

Table 14 Academic words in the low group's drafts

	Academic words
Only in the drafts; not in revisions (15 words)	Appreciating aspect assist conference consequence decline global globalization instance job overseas partnership period process source
In both drafts and revision (27 words)	Affect benefit benefits communicate communication convention cooperating cooperation culture cultures economy exhibiting exhibition exhibitions expand expose generation interaction invest participate participates participating potential promote similar technology trend

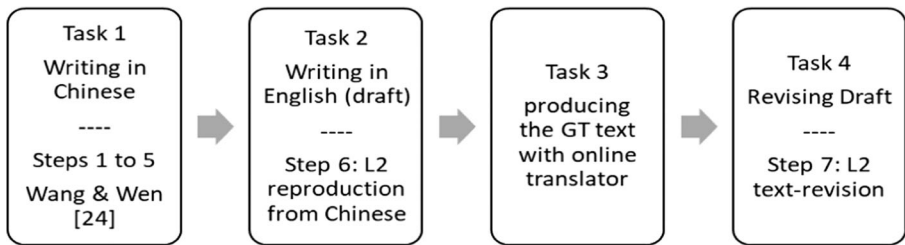


Fig. 1 The writing process with translanguaging

7 (L2 text-revision) in task 4. In the following, each task and their related steps are discussed to show how students utilized translingual resources in their L2 writing.

In task 1, data show that students employed all five steps to produce the Chinese version. In Step 1 task-examination, students read the requirements from the description of the assignment: *Write a composition mentioning the importance or advantages of participating in an international trade fair for a Taiwanese trading company.* Students' writing samples indicate that they understood the assignment and addressed the topic properly. However, despite the model sentence, students' drafts and even revisions still contain several collocation errors such as *joining foreign exhibitions, participating international exhibitions, MICE* (instead of exhibitions), as discussed in Examples 7 and 9. The errors suggest that students need to develop more careful reading skills.

In step 2 idea-generation, students brainstormed and generated ideas from the perspectives of Taiwanese trading companies. Students' Chinese writing samples reported many economic benefits of attending trade fairs, and some students also mentioned political benefits. Students identified economic benefits to include face-to-face product demonstration, the opportunity to showcase Taiwan's products, interacting with foreign companies, gaining insight into how foreign companies conduct business, etc. The political benefits included allowing other countries to understand Taiwanese culture and enhancing Taiwan's international status.

In step 3 idea-organization, students' Chinese writing samples show that most of them were able to present and explain the importance and list advantages of participating in international trade fairs. In step 4, the process-control step, student samples show that most compositions are complete with introduction, conclusion, and a body section where the ideas were elaborated. In Step 5 (text-generation), student samples show that most compositions are between 80 and 150 words in length and written in one paragraph.

In task 2, when the English text was drafted, comparison between the Chinese and Drafts suggested that students did not go through the five-step composing process again to produce the drafts. Instead, they reproduced the English text based on ideas already generated in the Chinese text. In this task, students underwent an additional step, which we would label as step 6, the L2 text-reproduction step.

In step 6, students did not merely translate the Chinese text to English word by word. They also modified the text based on their L2 knowledge of vocabulary and grammar. The modification addressed the different grammatical structures between Chinese and English, such as adding grammatical subjects (e.g., *we*), and the addition of cohesive devices (e.g., *and, therefore, moreover*). In this step, data

suggest that some students even added new ideas to the draft (to discuss in Example 11).

Example 10 by student L7 illustrates the process involved in step 6 to include subtask 6-1: translation of words; subtask 6-2: negotiate between two language systems; subtask 6-3: improve on style; subtask 6-4: create new content (Table 15). In the edits, the student added grammatical subjects (i.e., *you*, *MICE*) to form complete sentences in English. The student also used the phrase *seize the chance to* to improve from the Chinese text 能 [is able to], and added the phrase *MICE will assist you* as the grammatical subject to clarify the relationship between the grammatical subject, verb, and object.

(Example 10 Chinese) 除了在產品上的交流,同時也能拓展人脈關係,參展中能認識各種國家的人士,增進國際間的交流。

(Draft) Except for the connecting with products, *you have to seize the chance to* broaden the relationship with different people in the conference. *MICE will assist you to* increase the interaction country by country. (Edits italicized)

After both the Drafts and GT texts were produced, students performed step 7 which involves three subtasks: leverage GT content, improve on language style, and, for some students, add new content (Table 16). As Example 11 illustrates, student H8 added new ideas in both steps (Table 17).

The above discussion suggests that a translingual environment not only allows students to leverage prior language in L1 through the drafting but also encourages students to compare the two languages. In the process of shuttling between the two languages, students engaged in more writing steps and as a result produced more ideas and better quality of writing. The 7-step process enables both the high and low students to think more deeply about what to write, and produce L2 compositions with more reiterations, which lead to better representation of their content knowledge.

The additional two steps identified in this writing assignment also highlight the complexity of the translanguaging in writing. Translanguaging involves more than

Table 15 Subtasks in step 6 text-reproduction from Chinese to Draft in English

Subtasks	Chinese text	Text in drafts
6-1 Translate from Chinese	a. 除了在產品上的交流 b. 拓展人脈關係	a. <i>Except for the connecting with products</i> b. <i>Broaden the relationship with different people.</i>
6-2 Negotiate between 2 language systems	(No grammatical subjects in the Chinese text)	<i>You have to...</i> <i>MICE will</i>
6-3 Improve on style	能 [is able to]	<i>seize the chance</i> <i>assist you to increase...</i>
6-4 Generate new content	Example 11 (Table 17)	

Table 16 Subtasks in step 7 text-revision of Draft and GT

Subtasks	Examples	Comments
7-1 Leverage GT content	Examples 1 and 2 (Tables 4 and 5)	Participants imported content from GT/L1 knowledge.
7-2 Improve language accuracy and styles on drafts	Examples 3 to 9 (Tables 6 and 9 to 11)	Participants edited the content to correct grammar, eliminate wordiness, include more action verbs, and business collocations.
7-3 Generate new content	Example 11 (Table 17)	

translating in that while translators usually deal with two texts (Chinese and English), our students' final writing was built on four (Chinese, English, GT, Revision). In each text, new ideas were generated, the language was reiterated, and the style was refined. At the same time, the use of online tool provided students with quick access to content and language resources. The seven steps also inform the specific training needed by students (to discuss). For instance, as Tables 15 and 16 indicate, students can benefit from training in translation, language edit, and collocations. The low group, in particular, will benefit more from the training.

Conclusion

The current study examined the translanguaging process engaged by ESP students and identified the benefits of leveraging students' L1 through online translation in an L2 writing process. Students' writing samples show that translanguaging is beneficial to EFL students' writing and that the use of online software such as Google Translate helped students from both the high and low groups to leverage prior knowledge, utilize more academic and business vocabulary, and produce correct sentence structures. Specifically, data show that the quality of writing has improved in terms of enriched content, professional style, and better language. In this regard, our findings are consistent with the benefits of translanguaging practice identified by García and Li [9] and Li [20].

Table 17 Example 11: new content added in student H8's draft and revision

Chinese and GT	Draft (new content italicized)	Revision (new content italicized)
親身去體驗及學習 [I]t is necessary to experience and learn in person.	[W]e have to <i>see the world personally</i> and to learn <i>from other countries</i>	[T]his is why we <i>go abroad to take part in difference conference[s] and exhibition[s]</i> .
況且台灣不管是在軍事上 經濟上都受到嚴重的阻礙, 不像經濟強盛的國家擁有硬實力, Furthermore, Taiwan is not only militarily or economically harmed, but not as powerful economic countries have hard power,	Taiwan's military force and economic <i>development</i> have been obstructing, we do not have the great durable power like other nations, ...	What's more, Taiwan has been obstructed by <i>China's political pressure in every aspect for years. Knowing that whether in the military or economic are subject to serious resistance, not like the strong economy of the country has hard power.</i>

Our study also demonstrates that the combination of digital resources and translanguaging has helped students utilize their L1 and L2 linguistic resources more fully. Through thinking back and forth between two language systems, and between the different text versions, students were able to undertake more steps in editing both the content and form of their composition. Comparing to the traditional L2 writing classroom discussed by Wang and Wen [24], students' translanguaging has meant a more elaborate process involving pre-writing, reproducing, comparing, editing, and revising text. Finally, the study shows that the high and low groups both benefited from the use of online tools in terms of content, literacy, and style. In addition, data indicate that the high and low groups employed different revision strategies. The high group was able to integrate the GT text to create new content, whereas the low group tends to replace old words with new ones suggested by the online tool.

Contribution and Pedagogical Implications

The contribution of this study is threefold. First, the discussion of additional tasks adds insight to the L2 writing process in a translanguaging environment. Second, our study identified benefits from using online translation software. The contributions of digital tools on L2 writing are consistent with those identified by Canagarajah [4], Hynnien [14], Jones et al. [15], and Kuteeva and Mauranen [16]. Third, the findings lead to training recommendations discussed below.

Our study shows that ESP students could benefit from a learning environment where translanguaging and digital tools are encouraged. ESP teachers could provide explicit instruction to help students compare different language systems and edit different versions of the text. Specifically, training on editing the language generated by the online software is needed. While most students in our study could write correct sentences, several students copied the GT text even when the sentences were grammatically incorrect. They accepted the GT translation as is without correcting the grammatical errors or trying to integrate vocabulary from different texts. This was especially true with the low group.

Limitations of the Current Study

This result is limited by the following facts. Firstly, TOEIC scores were used to assign students to the high and low groups. Since TOEIC measures listening and reading abilities, one might argue that the scores may not reflect students' writing abilities. Secondly, most students in this study were at the B1 level, with the high group consisting of only four B2 students. The students were somewhat homogeneous and thus there was a lack of unique characteristics observed from the respective group. In addition, each of the writing tasks was timed. It is possible to argue that, given more time, the low group might have produced longer and better-written revisions.

The present study also points to limitations of the online translation software in general, which is that the quality of the GT text is depended on the Chinese text. Data shows that several students' Chinese text contains problematic sentences, which led to incorrect GT sentences. This could be due to students' poor writing skills or the time constraint of the assignment. Regardless, ESP teachers could solicit help from teachers who teach Chinese composition. If students receive additional training in how to write a

proper business Chinese text such as articles published in business magazines, students will become more familiar with the features of the business writing genre and thus are more likely to produce better-quality Chinese text, which in turn will generate better GT text.

Another limitation concerns with the benefit of raising cross-cultural awareness through practicing translanguaging approach in writing. The aim of translanguaging approach is to connect home language with the target language, and at the same time to build the target language through leveraging students' diverse linguistic assets. While it is important to build awareness about how writers of different cultures convey meanings and to compare rhetorical difference, this topic is omitted due to the length of this paper.

In conclusion, translanguaging creates a more dynamic learning environment for EFL students, and the use of the digital tool has shown benefits such as allowing students to utilize their L1 content knowledge, leverage both languages, and to engage in more writing steps. With proper support such as explicit instruction of form, the online software has the potential to be an effective learning tool.

Acknowledgments The authors would like to thank the participants of the study, the financial support from the Ministry of Science and Technology of Taiwan, and the three anonymous reviewers for their careful reading and constructive suggestions.

Compliance with Ethical Standards

Conflict of Interest The authors declare that they have no conflict of interest.

References

1. Canagarajah, A. S. (2011a). Codemeshing in academic writing: identifying teachable strategies of translanguaging. *The Modern Language Journal*, 95(3), 401–417.
2. Canagarajah, A. S. (2011b). Translanguaging in the classroom: emerging issues for research and pedagogy. *Applied Linguistics Review*, 2, 1–27.
3. Canagarajah, A. S. (2013). *Translingual practice: global Englishes and cosmopolitan relations*. New York: Routledge.
4. Canagarajah, A. S. (2018). Translingual practice as spatial repertoires: expanding the paradigm beyond structuralist orientations. *Applied Linguistics*, 39(1), 31–54.
5. Cook, G. (2010). *Translation in language teaching: an argument for reassessment*. Oxford: Oxford University Press.
6. Coxhead, A. J. (1998). *An academic word list*. (English Language Institute Occasional Publication No. 18). Wellington: Victoria University of Wellington.
7. Druce, P. M. (2012). Attitudes to the use of L1 and translation in second language teaching and learning. *Journal of second Language Teaching and Research*, 2(1), 60–86.
8. Fraser, L., Harich, K., Norby, J., Brzovic, K., Rizkallah, T., & Loewy, D. (2005). Diagnostic and value-added assessment of business writing. *Business Communication Quarterly*, 68(3), 290–305.
9. García, O., & Li, W. (2014). *Translanguaging: language, bilingualism and education*. Basingstoke: Palgrave Macmillan.
10. García, O., & Lin, A. M. Y. (2016). Translanguaging in bilingual education. In O. García & A. M. Y. Lin (Eds.), *Bilingual and multilingual education (encyclopedia of language and education, Vol. 5)*. Dordrecht: Springer.
11. Gimenez, J., & Thondhlana, J. (2012). Collaborative writing in engineering: perspectives from research and implications for undergraduate education. *European Journal of English Education*, 37(5), 471–487.

12. Gunnarsson, T., Housen, A., van de Weijer, J., & Kallkvist, M. (2015). Multilingual students' self-reported use of their language repertoires when writing in English. *Apples – Journal of Applied Language Studies*, 9(1), 1–21.
13. Han, S., & Shin, J.-A. (2017). Teaching Google search techniques in an L2 academic writing context. *Language, Learning and Technology*, 21(3), 172–194.
14. Hynnien, N. (2018). Impact of digital tools on the research writing process: a case study of collaborative writing in computer science. *Discourse, Context & Media*, 24, 16–23.
15. Jones, R. H., Chik, A., & Hafner, C. A. (Eds.). (2015). *Discourse and digital practices: doing discourse analysis in the digital age*. New York: Routledge.
16. Kuteeva, M., & Mauranen, A. (2018). Digital academic discourse: texts and contexts. Introduction. *Discourse, Context & Media*, 24, 1–7.
17. Kvashnina, O. S., & Sumtsova, O. V. (2018). Using Google to search language patterns in web-corpus: EFL writing pedagogy. *International Journal of Emerging Technologies in Learning*, 13(3), 173–179.
18. Le, Q. V., & Schuster, M. (2016). [A neural network for machine translation, at production scale](https://research.googleblog.com/2016/09/a-neural-network-for-machine.html). *Google AI Blog*. <https://research.googleblog.com/2016/09/a-neural-network-for-machine.html>. Accessed 1 Nov 2018.
19. Leonardi, V. (2010). *The role of pedagogical translation in second language acquisition*. Bern: Peter Lang.
20. Li, W. (2011). Moment analysis and translanguaging space: discursive construction of identities by multilingual Chinese youth in Britain. *Journal of Pragmatics*, 43, 1222–1235.
21. Tsai, S. C. (2018a). Using Google Translate in EFL drafts: a preliminary investigation. *Computer Assisted Language Learning*. Manuscript accepted for publication.
22. Tsai, S. C. (2018b). A preliminary study of Google Translate implemented into EFL writing: effectiveness and student perceptions. Manuscript submitted for publication.
23. Tullock, B. D., & Fernandez-Villanueva, M. (2013). The role of previously learned languages in the thought processes of multilingual writers at the Deutsche Schule Barcelona. *Research in the Teaching of English*, 47(4), 420–441.
24. Wang, W., & Wen, Q. (2002). L1 use in the L2 composing process: an exploratory study of 16 Chinese EFL writers. *Journal of Second Language Writing*, 11(3), 225–246.
25. Weijen, D., Bergh, H., Rijlaarsdam, G., & Sanders, T. (2009). L1 use during L2 writing: an empirical study of a complex phenomenon. *Journal of Second Language Writing*, 18, 235–250.
26. West, M. (1953). *A general service list of English words*. London: Longman, Green & Co..