
Teaching English Writing with Inductive Reasoning: Do EFL Students Need to be Assisted to Learn Inductively?

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Abstract

The paper reports on an experiment that was conducted in an EFL context to assess a learning aid called “Induction Helper” in a business correspondence writing course. Two tests were devised to collect data: a writing knowledge test and a writing skill test. Participants were 52 third-year Business English majors. Results indicate a significant difference in the posttest writing-skill scores of the control group ($M = 12.00$, $SD = 1.65$) and the experiment group ($M = 15.65$, $SD = 2.17$); $t(50) = 6.83$, $p < .01$. This signifies that although inductive instructions helped EFL students improve their business writing, the students who used the Induction Helper were able to write significantly better than those who didn’t. There was not a significant difference in the mean scores of the writing-knowledge retention test of the experiment group ($M = 16.50$, $SD = 2.30$) and the control group ($M = 15.08$, $SD = 3.20$), $t(50) = 1.84$, $p = .072$. However, there was a significant difference in the mean scores of the skill retention test of the experiment group ($M = 15.40$, $SD = 1.81$) and the control group ($M = 10.96$, $SD = 1.48$), $t(50) = 9.67$, $p < .01$. These results suggest that the Induction Helper helps EFL students improve and retain both their knowledge and writing skill on a long-term basis at a statistically significant level. The study also found that that knowledge and skills are separate concepts and that the possession of knowledge doesn’t necessarily ensure the application of that knowledge in practice.

Keywords: Business Writing, Inductive Reference, Instruction, EFL, Thailand

Introduction

Writing a successful business correspondence nowadays does not involve a mere set of writing skills. The production of a business writing piece is a complex task and becomes a skillful, interleaving process. Writing an effective writing document for real-world business correspondence requires multiple elements, which include, but are not limited to, appropriate use of rhetorical conventions, powerful word-choices, eye-catching presentation of textual information, attention-grabbing imagery, and striking designs and layouts (Yu & Fu, 2014; Sardegna & Slutsky, 2018). Business writers need skills to incorporate these multiple elements into business documents that they are producing. Good business writers are ones that convey the accurate message to the audience and make the audience take the action expected (Canavor, 2015; Sankrusme, 2017). Instruction of business writing in higher education needs to be aligned with standards that embody career requirements.

To put it simply, the instructional approaches that are adopted must ensure that students are career-ready and possess the knowledge and skills required in their future careers (Sardegna & Slutsky, 2018). Thus, business writing courses offered in higher education should serve as a scaffold which enables learners to become business writers who possess the aforementioned skills and ensure that the knowledge of business writing principles and business writing skills that learners acquire in their higher education are retained on a long-term basis.

In countries where English is a Foreign Language (EFL countries), the instructional methodologies for teaching English business writing are varied and there is no conclusive answer which one is the best. Inductive reasoning is one of the many approaches that lecturers of writing adopt. Extensive research has compared

the inductive and the deductive approaches and opined that inductive teaching approaches were more effective for teaching English than deductive approaches (e.g., Rungwaraphong, 2021; Benitez-Correa, Gonzalez-Torres, Ochoa-Cueva, & Vargas-Saritama, 2019; Larsen-Freeman, 2015; Mallia, 2014; Obeidat & Alomari, 2020; Risnah, 2018). Under the same umbrella of inductive reasoning, there are different forms of inductive teaching methods (Prince & Felder, 2007). Each different form of inductive instruction fosters a deeper understanding of a concept in learners and promotes the transfer and retention of that understanding and knowledge on a long-term basis (Gick & Holyoak, 1983; Shemwell, Chase, & Schwartz, 2015; Symons, Dillon, & Hoffbeck, 2019).

However, despite numerous advantages of inductive instructional methods, the inductive methods have several limitations, particularly when implemented with learners in an EFL context. One of the main of the limitations is the ability of EFL learners to make inductive references within a limited time and to accurately formulate rules on their own (Risnah, 2018; Rungwaraphong, 2021). That EFL learners are not able to make inductive references on their own suggests that teachers may need to provide learning aids for EFL learners which they can use when learning inductively. Recognizing these gaps of inductive instructional approach, the researcher devised a learning aid called “Induction Helper” and implemented it in business English writing courses. The study reported in this article, therefore, was conducted to examine the implementation, effectiveness, and ability to retain knowledge and skills of the “Induction Helper” in an EFL business English writing setting.

Theoretical Framework

Inductive Vs Deductive Teaching Approaches

Inductive reasoning, when applied in education, is considered an inductive instructional method, which refers to instruction that begins with a question or challenge, rather than presenting the knowledge to the learners. Technically speaking, rather than being presented with the target knowledge, learners are presented with a number of examples and are required to notice, observe patterns, discover, analyze, and formulate rules by themselves (Nunan, 1999; Thornbury 1999; Risnah, 2018; Rungwaraphong, 2021). These elements form the process of inductive learning. According to Thornbury (1999), teachers give examples to learners so that the learners can derive the rules and create an understanding of the topic based on those examples. Inductive learning methods come in a wide range of forms, such as inquiry-based learning, problem-based learning, or discovery learning, differing essentially in the nature of the challenge, and the type and degree of support provided by the teacher (Prince & Felder, 2007).

The inductive instructional method is the opposite of the deductive instructional method. Deductive teaching is the other way around. With deductive instruction, the teacher begins by providing the rules, theories, or principles about the target language or concept to the students, and then continues by examples (Benitez-Correa, Gonzalez-Torres, Ochoa-Cueva, & Vargas-Saritam, 2019; Male, 2016). It can be said that deductive teaching approach is rules-driven, as learners are explicitly presented with the rules followed by examples. Whereas, in the inductive approach, learners are rule-discoverers as they are presented with examples and are responsible for discovering the rules themselves.

In this light, deductive approach learners are passive receivers of knowledge, while inductive approach learners are active discoverers of knowledge, as they are responsible for exploring the rules themselves. While the process of inductive learning is experiential and learner-centered, deductive instruction is a more traditional, teacher-centered approach (Thornbury, 1999).

Both instructional approaches have advantages and disadvantages. Nevertheless, an extensive literature base indicates that inductive instruction is widely accepted as being more efficient in the long run. For example, Larsen-Freeman (2015) investigated which approach- deductive or inductive- helped students learn language rules better. Results indicated that students learned language rules by reading textbooks (inductively) better than when they were taught the rules directly (deductively). Larsen-Freeman explained that, with the inductive approach, learners see things the way they are, or, in other words, they see how the target language is used in its context. Risnah (2018) reported similar benefits of inductive instruction when implemented in teaching English phrases for first-year students. In line with Thornbury (1999), Risnah posits that, in classes where inductive teaching is adopted, learners are more active in completing assigned tasks. However, inductive learning approach may be frustrating for some students because the approach requires much time and energy of the students to discover patterns and formulate rules on their own (Abdukarimova & Zubaydova, 2021)

Therefore, inductive instruction requires the teachers to carefully plan how they arrange time and activities in the class as students need more time to make inductive references - that is, it takes time for them to work out the rules. Furthermore, planning inductive approach lessons

is more demanding because teachers need to research, design, and create the materials. In addition to these, teachers need to seek out the correct examples, which means they must find examples that facilitate students' ability to make inductive references.

Like Risnah's study, a later study of inductive instruction by Rungwaraphong (2021) indicated that despite its broad range of benefits, inductive teaching has certain limitations, particularly when it is implemented in EFL contexts. First of all, inductive instruction imposes demand on teachers, in regard to preparing lessons and sorting out appropriate examples for each given topic. Secondly, there is a huge requirement for learners to discover the patterns in the given examples, to work out the rules, and to formulate the rules or principles on the given topics on their own within a given time limit. It is also the teachers' responsibility to thoroughly check the accuracy of the rules that learners have formulated. Finally, EFL learners' ability to make accurate inductive references on their own is a significant issue that teachers need to take into account if inductive instruction is to be implemented in their classrooms. All the limitations of inductive instruction as identified in the previous study by Rungwaraphong (2021) imply that EFL learners need to be provided with specific "aiding tools" that will assist them in the process of inductive learning.

Dual-coding Theory

In addition to inductive referencing, Dual Coding Theory (DCT) is adopted as a framework for the current study. DCT is a theory by Paivio (1971) which explains human cognition. It posits that human memory and understanding of surrounding things operates in a rich network of verbal and nonverbal (or imagery) information

(Clark & Paivio, 1991). Researchers and theorists under DCT believe that a person processes and understands information better if it is presented in combination of visual and verbal forms. DCT explains that faster and more accurate processing, or encoding, of new information is the result of the "concreteness effects" (Paivio, 1986). The concreteness effect, according to Schwanenflugel, Akin, and Luh (1992), arises from different representations of information and the availability of contextual information. A person's prior knowledge is an important source of their contextual information, which they use to associate new information with their memories. According to Jessen et al., (2000), an emphasis is placed on the correct application and operation of the image-based system. This is to say, implementing DCT into lessons or learning activities is not just adding pictures or combining visuals with words; the visuals must be carefully selected to meet the purposes of the lessons and learning activities and learners must be provided with sufficient time to process, integrate, and comprehend the two representations. Visuals are not limited to pictures or images, but can also include diagrams, graphic organizers, mind maps, and so on. According to DCT, the two systems of representations are linked and these links are called referential connections (Clark & Paivio, 1991; Paivio, 1986). These links form a complex associative network, which helps improve encoding, permits better storage, and aids recall. To optimize memory capacity and improve a person's learning, their so-called associative network must be maximized (Sweller, Ayres, & Kalyuga, 2011).

Given the facilitative effects of DCT on the rapid and accurate processing of information and recognition in the long run, the theory has been widely adopted in English instruction in

both native and non-native contexts. In non-native, or EFL and ESL, contexts, Yanasugondha (2017) examined the effectiveness of DCT on Thai EFL students' working memory and long-term memory. Confirming the virtue of DCT, the study's results suggested that visuals and mental imagery are referential objects and their use is regarded as pictorial-coding. The study found that this coding can be adopted as a language learning strategy because it can help lower proficiency students recall and retain the meanings of new words better. Another study by Samburskiy (2020) examined the impact of a dual-coding techniques on EFL and ESL students' interpretations of unfamiliar idioms. The study found that students were more likely to correctly interpret the meaning of an English idiom if its figurative meaning was visualized. The visualization of an idiom's meaning is accomplished by combining the literal and

figurative aspects of its meaning in an image. This enables students to create a link between the literal and figurative features of an idiom and correctly interpret its meaning.

The intervention: Induction Helper

Given the limitations of the inductive instructional approach identified in the literature review and the facilitative effects of DCT, the researcher created an intervention called Induction Helper. The Induction Helper is a sheet of A-4 paper bearing information on both sides. One side bears a sample of a business document while the other side displays the target elements and features essential for that type of business document. Figure 1 is a sample of the Induction Helper on the topic of Facebook Ad Content and Figure 2 is a sample for the topic of Business Emails.

Figure 1

Induction Helper for Writing Facebook Ads

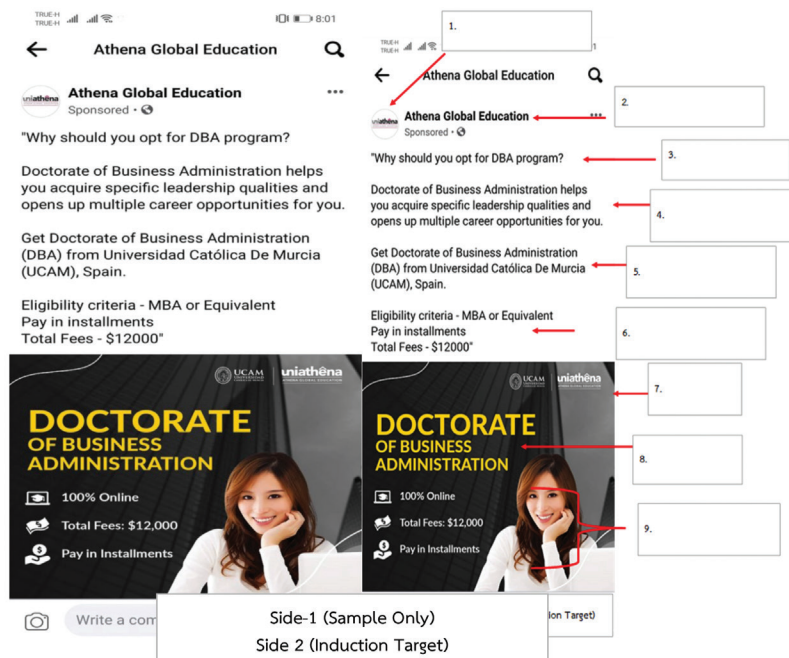
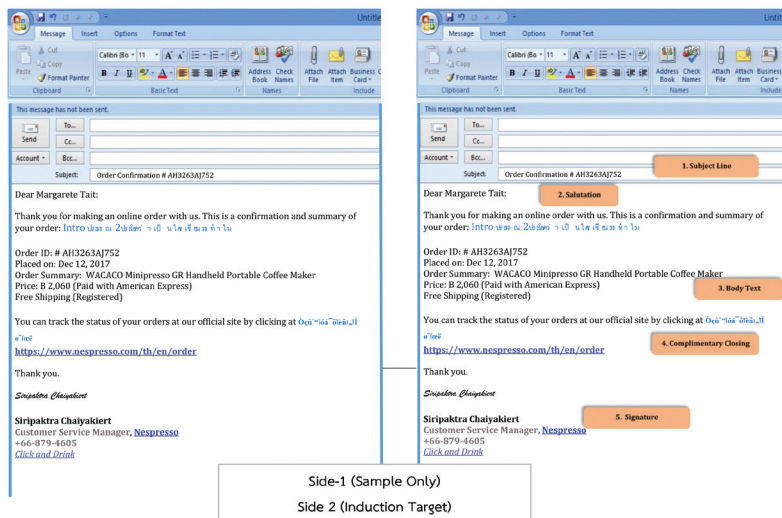


Figure 2
Induction Helper for Writing Business Emails



The Induction Helper, as shown in Figures 1 and 2, is intended to be used by EFL learners as an aid for making inductive references. The Induction Helper created for each business writing topic is not a regular learning handout. While a learning handout is an instructional tool which aims to help students get a clear overview or to sum up what they have heard in a lecture, the Inductive Helper seeks to assist learners to make inductive references i.e., to discover patterns and formulate rules on their own. As mentioned earlier, the Induction Helper is framed upon the perspectives of Paivio's (1971) Dual Coding Theory (DCT), which is a theory of human cognition that posits that a person learns through the association of verbal and visual representations, called logogens and imagens (Paivio, 1986). In this light, the Induction Helper highlights the explicit visibility, i.e., images can aid learning and learners learn better when both visual and verbal information are used to represent information. In light of this, the Induction Helper is produced in a way that makes the points that students need to make observations more noticeable.

To enhance the visibility and noticeability of the examples given to them, the Induction Helper provides rectangular fields with numbers so that learners can explicitly see where to start and what to notice. In the process of noticing and observing, the learners follow the Induction Helper step-by-step to discover the target elements or patterns and arrange the information they discover so that they can sum it up and formulate the writing rules of each business writing topic on their own.

No studies so far have investigated the incorporation of DCT with inductive instructional methods. The Induction Helper investigated in the current study was the pioneer of the combination of these two concepts into the teaching of business English writing in EFL contexts. In the current study, the group of participants who used the Induction Helper are regarded as being taught using an assisted inductive instructional approach while the other group of participants did not receive the intervention and were regarded as being taught using a conventional inductive teaching method.

Research Objectives and Hypotheses

The current study aimed to (1) evaluate the effectiveness of the Induction Helper in promoting EFL learners' ability to inductively acquire knowledge and skills in business English writing; (2) assess the capacity of the Induction Helper in enhancing EFL learners' retention of knowledge and skills in business English writing; and (3) determine if there is an association between EFL learners' knowledge and their skills in business writing. To address all these objectives of the study, three hypotheses were tested:

Hypothesis 1: There is no significant difference in the means for business writing knowledge and business writing skills between subjects taught by a conventional inductive approach and those taught by an assisted inductive approach immediately after the completion of instruction.

Hypothesis 2: There is no significant difference in the means for business writing knowledge and business writing skills between subjects taught by a conventional inductive approach and those taught by an assisted inductive approach eight weeks after the completion of instruction.

Hypothesis 3: There is no linear correlation between the subjects' business writing knowledge and their business writing skills.

Methods

In this study, an experimental design pretest, posttest, posttest-retention control group model was used.

The Setting and the Participants of the Study

The study was conducted as part of a business writing workshop organized by the researcher. The workshop was held live online

via Zoom due to Covid-19. One hundred and twenty-seven Thai students in their third year of studying Business English or Business English Communication from four government universities in Thailand were invited by email to participate in the workshop. In the invitation, the students were told that their participation in the study was voluntary, that they had the freedom to withdraw from the study at any time without any unfavorable consequences, and that they would not be harmed by either their participation or non-participation in the project.

Ultimately, fifty-two students volunteered to take part in this workshop. They were aged between 20-22 years old and had a minimum of 8 years of learning English as a Foreign Language (EFL) in their primary and high school. None of the participants were from an international curriculum, nor had they studied in international schools before entering university. Additionally, they had not attended any workshop or training on business writing prior to participating in the study. Furthermore, they had not resided in an English-speaking country. Based on the results of their universities' English proficiency tests, 91.5 % of the participants were intermediate level, while the remaining 8.5 % were advanced level.

Once the students had agreed to participate, consent forms were sent electronically for them to sign. They returned the signed consent forms via email to the researcher. Forty-one of the students were female and 11 were male. After recruitment, the participants were randomly divided into a control group (n=26) and an experimental group (n=26). As a result of random sampling, the two genders were equally distributed across the control and experimental groups with 21 females and 5 males in the experimental group and 20 females and 6 males in the control group.

Design of the Study

The current study adopted an experimental research, pretest-posttest control group design. In this type of research design, tests were provided to the participants both before and after the non-control or the experiment group receives exposure to the intervention. The experimental group learned to write four types of business writings using the Induction Helper, whereas the control group studied using the traditional inductive approach, which did not use the Induction Helper. The assessments were performed both before and after the treatment. Test of Business Writing Knowledge (TBWK) and Test of Business Writing Skills (TBWS) were administered to both groups in three intervals: (1) before the start of the workshop as a pretest; (2) right after completion of the workshop as a posttest; and (3) eight weeks after the posttest as a retention test.

A retention test was also adopted in the current study to determine whether the intervention enabled students to retain knowledge and skills on a long-term basis. The retention test was used to measure the capability of the intervention to enhance learning retention, which can be assessed with tests administered 2 or more weeks after lessons were taught and learners were previously tested (Haynie, 1995). A delay period of 8 weeks was used in this study.

Learning Procedures in the Conventional versus Assisted Inductive Approaches

The cycle of learning procedures in the workshop was adapted from Rungwaraphong's (2021), as shown in Table 1.

According to Table 1, the learning procedure carried out in the experimental group, or the group that was given the Induction Helper, involved steps similar to those of conventional inductive teaching, except that it includes providing the "Induction Helper" right after the business writing examples were given to the students. The students in both the control and the experimental groups learned and made inductive references based on the examples they were provided, initiating their own learning and interrogating their peers to help each other detect the rules, patterns, or styles in the writing that appeared prevalently in the provided examples. The differences in the procedures were in Steps 3 and 4. In Step 3, where the lecturer asked prompt questions to the students in the control group to help them make inductive references, the students in the experimental group used the "Induction Helper" to guide them in making inductive references independently. In Step 4, the students in the experimental group wrote the rules they had discovered using the Induction Helper. The rest of the learning procedures were the same in both the conventional and assisted inductive learning approaches.

Table 1*Learning Procedures in the Conventional versus Assisted Inductive Approaches*

Conventional Inductive Learning		Assisted-Inductive Learning	
Step 1 Showing	Students are presented with samples of business writing (memos, emails, letters, or Facebook ads).	Step 1 Showing	Students are presented with samples of business writing (memos, emails, letters, or Facebook ads).
Step 2 Noticing & Discovering	Then they observe or notice the given samples. The teacher asks a set of prompt questions.	Step 2 Assisting	The students are given the Induction Helper to work on their own, or with peers, to detect patterns. Students observe or notice the given samples.
Step 3 Inducting	The students work on their own, or with peers, to detect patterns. They derive the concepts of the target business writing supported by the lecturer's prompting.	Step 3 Inducting	They derive the concepts of the business writing targeted in the Induction Helper.
Step 4 Formulating	The students formulate their thoughts by reflecting on what they already know and the context of the given samples. Then they conclude what the 'writing rule' is for themselves.	Step 4 Formulating & Recording	The students formulate their thoughts by reflecting on what they already know and the information elicited from and noted in the Induction Helper. Then they conclude what the 'writing rule' is for themselves.
Step 5 Applying & Creating	The students write business documents applying the rules formulated in Step 4.	Step 5 Applying & Creating	The students write business documents applying the rules formulated and recorded in the Induction Helper.
Step 6 Feedbacking & Revising	The teacher provides feedback on the students' writing pieces and the students revise their writing following the teacher's feedback	Step 6 Feedbacking & Revising	The teacher provides feedback on the students' writing pieces and the students revise their writing following the teacher's feedback
Step 7 Evaluating	Students' writing pieces are evaluated after revision.	Step 7 Evaluating	Students' writing pieces are evaluated after revision.
Step 8 Concluding	Teacher makes conclusions about the lesson.	Step 8 Concluding	Teacher makes conclusions about the lesson.

Data Collection Tools

In the current study, the following two tests were designed by the researcher to be used as the data collection tools.

Test of Business Writing Knowledge (TBWK)

Business writing knowledge is one person's awareness and theoretical understanding of principles in business writing. It is information pertaining to business writing that a person has obtained by experience or study. In the current study, the Test of Business Writing Knowledge (TBWK) was used to measure the students' degree of knowledge of business English writing. The test was devised by the researcher as a new assessment for this study. To determine content and face validity of the TBWK, the researcher submitted the test to a panel of business English writing experts. Based on the experts' review, the test was revised, which ensured that the final version's content was related to the principles of business writing. The test measures the students' knowledge about the fundamentals of four types of business writings - specifically, an email, a memo, a letter, and a Facebook advertisement. The test consisted of 20 multiple-choice test items with each item having five response alternatives. The reliability of the TBWK was assessed via the test-retest method. It was administered twice to 20 third-year business English students who were invited to join the pilot test. Three weeks separated the two administrations. An Alpha Cronbach's correlation coefficient of (.90) was calculated. An internal consistency reliability check was also conducted, and it was found that the alpha coefficient for the TBWK was (.92).

Test of Business Writing Skills (TBWS)

Business writing skills refer to one person's ability to communicate business ideas or information accurately, clearly and as intended through

a well-written text. In the current study, the Test of Business Writing Skills (TBWS) was employed to measure the business writing skills of third year business English students at government universities in Thailand. Like the TBKW, the TBWS was devised by the researcher as a new assessment for this study and was sent to the same panel of business English writing experts to determine its content and face validities. The test was comprised of four tasks and each task received an equal relative weight of 20 points. The total scores were summed and averaged, so the total points for Test of Business Writing Skills were 20 points. The participants in both groups were required to write the following items:

- (1) A meeting invitation email
- (2) A memo about facility updates
- (3) A letter complaining about a broken product
- (4) A Facebook ad for an online course

The rubric for assessing the writing tasks was adapted from Rungwaraphong (2021). The rubric assessed five fundamental aspects of the quality of the business writings: (1) content; (2) rhetorical conventions; (3) grammar; (4) visual appeal and format; and (5) organization. Each aspect had a weight of four points, making the total possible score for each writing piece 20 points. Three Thai lecturers in business English writing were invited to independently rate each student's papers. The scores from each rater were summed and calculated to derive the average score. A pilot test for both tests was carried out with 20 third-year business English students who did not participate in this study. In the pilot test stage, the optimal test time for each test was calculated. Accordingly, it was determined that the time for writing the four business documents in the TBWS should be three hours and 30 minutes should be allowed

for taking TBWK. Both tests were used as the pre-, post-, and retention- tests.

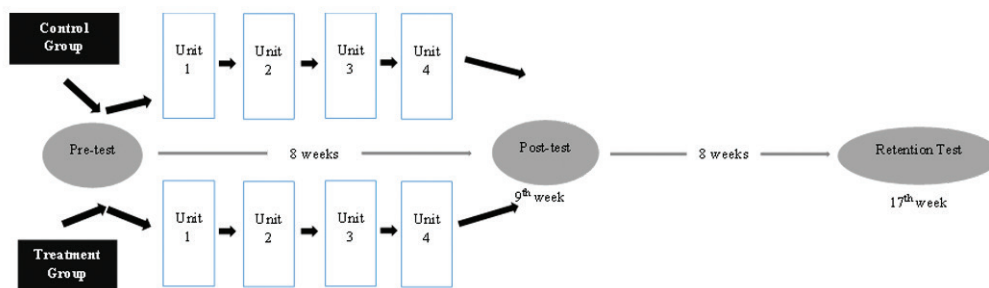
Experimental Procedure

The study was conducted during an eight-week business writing workshop organized by the researcher. The workshop was comprised of four units which covered memos, emails, letters, and Facebook ads, respectively. Each unit was taught over a two-week period. The workshop was held for three hours each Saturday for eight weeks and totaled 24 hours instruction for each group. The same writing lecturer taught both groups. Morning sessions were conducted with the control group while the afternoon sessions were for the treatment group. The workshop was held on a virtual platform due to the Covid-19 pandemic situation and to facilitate the participants' participation because they were geographically dispersed.

Before the workshop began, the student participants were randomly divided into two groups: one was instructed using a conventional inductive teaching approach and acted as the control group while the other received the treatment (the Induction Helper) and acted as the treatment, or experimental, group. A pretest was administered to both groups before the beginning the workshop. After the workshop was completed, both groups took a posttest to measure their achievement and writing performance in the ninth week. A retention test to measure their knowledge and writing skill retention was administered 8 weeks after the posttest. The experiment procedure, which included the pretest, the writing training, the posttest, and the retention test, is graphically illustrated in Figure 3.

Figure 3

Experimental Process



Both the experiment and the control groups were taught under the same daily workshop conditions and routines, but the method of instruction and learning activities were different. The experiment group received the Induction Helper to facilitate their writing activities while the control group was provided with conventional inductive learning. After the training sessions

were completed in the 8th week, the posttest was administered to the students in both groups in the 9th week. In the posttest, they were expected to work independently on the two tests -TBWK and TBWS. A retention test, or a delayed posttest, was administered to both groups of the students 8 weeks after the administration of the posttest. The students in the experiment

group were not allowed to use the Induction Helper when they were taking the posttest and the retention tests. The test results were collected and analyzed to determine whether the treatment had a positive effect on their understanding and knowledge of business writing principles and their writing performance, and to determine the degree of knowledge and writing skill retention of the students in both groups.

Data Analysis

All statistical analyses were conducted using SPSS (version 19, IBM Corp.) An Independent Samples T-Test was conducted to compare the means of the control and the experimental groups and to determine whether there is statistical evidence that the associated population means are significantly different. While paired sample t-tests were performed to ascertain if null hypotheses 1 & 2 could be accepted or rejected,

Pearson correlations were used to assess any bivariate associations in hypothesis 3. Given that the hypothesis sought to assess the association between two sets of scores, Bivariate Pearson Correlation is the appropriate statistical procedure (Asuero, Sayago & González, 2006; Giuseppe, 2019).

Results

Hypothesis1: There is no significant difference in the means for business writing knowledge and business writing skills between subjects taught by a conventional inductive approach and those taught by an assisted inductive approach immediately after the completion of instruction.

Table 2 reports the mean scores of the Test of Business Writing Knowledge (TBWK) for the students from the control and experiment groups, in the pretest and the posttest.

Table 2
Business Writing Knowledge Pretest & Posttest Results

Tests	Control (n=26)		Experiment (n=26)		t	df	Mean Difference
	Mean	SD	Mean	SD			
TBWK (Pretest)	10.69	3.11	11.00	3.46	.337	50	.307
TBWK (Posttest)	15.61	2.71	16.57	2.89	1.237	50	.961

Note *** $p < .001$; ** $p < .01$; * $p < .05$

As can be seen in Table 2, there was not a significant difference in the knowledge pretest scores between the control group ($M = 10.69$, $SD = 3.11$) and the experiment group ($M = 11.00$, $SD = 3.46$; $t(50) = .34$, $p = .072$). This indicates that the business writing knowledge of the two groups before starting the experiment were equal. As for the knowledge posttest, there

was not a significant difference in the mean scores of the experiment group ($M = 16.57$, $SD = 2.89$) and the control group ($M = 15.61$, $SD = 2.71$); $t(50) = 1.24$, $p = 0.72$. The similar mean scores and the similar increases in the mean TBWK score intervals for both groups indicate that Thai students improve their understanding and knowledge of the concepts, rules, and

principles of business writing on a similar level, regardless of whether they inductively learned with or without the Induction Helper.

The pretest and posttest results of the Test of Business Writing Skills (TBWS) are presented in Table 3.

Table 3

Business Writing Skill Pretest & Posttest Results

Tests	Control (n=26)		Experiment (n=26)		t	df	Mean Difference
	Mean	SD	Mean	SD			
TBWS (Pretest)	8.50	1.73	8.73	1.87	.463	50	.230
TBWS (Posttest)	12.00	1.65	15.65	2.17	6.833	50	3.653**

Note *** $p < .001$; ** $p < .01$; * $p < .05$

Table 3 shows that the mean score of the writing skill pretest of the students learning without the induction helpers ($M = 8.50$, $SD = 1.73$) was not significantly different from the mean score of the students learning with the inductive helpers ($M = 8.73$, $SD = 1.87$); $t(50) = 0.46$, $p = .072$. This result, like the results from the knowledge pretest, indicate that the participants in both groups had similar level of business writing skills before the experiment took place. However, there was a significant difference in the posttest writing-skill scores of the control group ($M = 12.00$, $SD = 1.65$) and the experiment group ($M = 15.65$, $SD = 2.17$); $t(50) = 6.83$, $p < .01$. Importantly, the analysis further found that the posttest maximum score of the control group was 15, while that of the experimental group was 20. Although the mean score for the writing skills of the control group increased from 8.50 to 12.00 points, it was a slight improvement (score improvement by 3.5 points) in comparison to the increase of the experiment group, from 8.73 to 15.65, (score improvement by 6.92 points). These results show that the inductive helpers do have an effect on the students'

business writing skills. Specifically, the results suggest that when the students learn with the inductive helpers, their business writing skills significantly improve.

Therefore, from the results illustrated in Tables 2 & 3, it can be concluded that the Thai learners who used the inductive helpers to assist them in making inductive references improved their business writing skills far more than those who learned inductively without using the helper sheets. This confirms Hypothesis 1, that the Induction Helper is effective for improving the students' writing skills, but not for improving the students' business writing knowledge. In other words, although both inductive teaching methods equally improved the learners' knowledge of business writing principles, the students in the experimental group who received the treatment - or the Induction Helper- improved their business writing skills significantly more than the students in the control group who did not use the Induction Helper.

Hypothesis 2: There is no significant difference in the means for business writing knowledge and business writing skills between

subjects taught by a conventional inductive approach and those taught by an assisted inductive approach eight weeks after the completion of instruction.

This hypothesis aimed to investigate the retention of writing knowledge and writing skill of the students who had learn inductively with, and without, the induction helpers. The question

was whether, eight weeks after the completion of the writing workshop, would the students in the experiment group, who had been given the induction helpers, retain more of the knowledge and skills they had acquired during the workshop than the students in the control group. Table 4 compares results for the TBWK and TBWS in the posttest and the retention test.

Table 4

Posttest and Retention Tests Results of TBWK & TBWS

Tests	Control (n=26)		Experiment (n=26)		t	df	Mean Difference
	Mean	SD	Mean	SD			
TBWK (Posttest)	15.61	2.71	16.57	2.89	1.237	50	.961
TBWK (Retention test)	15.08	3.20	16.50	2.30	1.837	50	1.420
TBWS (Posttest)	12.00	1.65	15.65	2.17	6.833	50	3.653**
TBWS (Retention test)	10.96	1.48	15.40	1.81	9.673	50	4.440**

Note *** $p < .001$; ** $p < .01$; * $p < .05$

According to Table 4, there was a significant difference in the TBWS posttest scores of the students learning with the Induction Helper ($M = 15.65$, $SD = 2.17$) and the students learning without the Induction Helper ($M = 12.00$, $SD = 1.65$); $t(50) = 6.83$, $p < .01$. This confirms that the students who received the Induction Helper were more likely to create higher quality business writing documents than those who did not. Likewise, there was a significant difference in the mean scores of the TBWS retention test of the experiment group ($M = 15.40$, $SD = 1.81$) in comparison to the control group ($M = 10.96$, $SD = 1.48$), $t(50) = 9.67$, $p < .01$. This result shows

that eight weeks after completion of the workshop the students learnt with the Induction Helper were still able to create higher quality business documents than those who learnt without the Induction Helper. However, there was not a significant difference in the mean scores of the TBWK retention test of the experiment group ($M = 16.50$, $SD = 2.30$) and the control group ($M = 15.08$, $SD = 3.20$), $t(50) = 1.84$, $p = .072$. In Table 5, the Pair t-test was adopted to compare mean scores, of TBWK and TBWS, between the posttest and the retention tests in both the control and the experiment groups.

Table 5

Pair Comparison: Posttest and Retentions Test Results

Pair Comparison (I – J)	Control Group (n=26)					Experiment Group (n=26)				
	Mean Diff (I-J)	SD	t	df	Interp	Mean Diff (I-J)	SD	t	df	Interp
TBWK (Post) & TBWK (Re)	-0.53	2.5 9	- 1.0	2 5	↓	-0.07	2.5 8	- 0.1	2 5	↓
TBWS (Post) & TBWS (Re)	-1.04**	1.1 9	- 4.4	2 5	↓	1.0 -0.25	- 1	- 1.2	2 5	↓
				5					8	

Note *** $p < .001$; ** $p < .01$; * $p < .05$

According to Table 5, the control group's mean score of the knowledge retention test was only 0.53 lower than that of the posttest, showing no statistically significant difference. However, the mean score of the skill retention test of this group decreased from the posttest at a significant level (a decrease of 1.04 points and statistically significant at the 99% confidence level). The experimental group, in contrast, had the mean score of the knowledge retention test that was only 0.07 lower than that on the posttest, showing no statistically significant difference. Likewise, the mean score of the skill retention test of the experiment group was only 0.25 lower than that on the posttest, showing no statistically significant difference. This finding suggests that eight weeks after the completion of the training, the students who learnt with the Induction Helper could maintain the same level of business writing knowledge and create the same quality of business

documents as they did right after completing the training. From these results, it can be concluded that the students who learnt inductively without the induction helpers were able to retain their knowledge, but not their writing skills. In contrast, the students who learnt inductively with the induction helpers were able to retain both their knowledge and writing skill at a statistically significant level.

Hypothesis 3: There is no linear correlation between the subjects' business writing knowledge and their business writing skills

In this hypothesis, the Pearson Correlation 2-tailed Test was used to measure the relationship between the learners' knowledge of business writing principles and rules and their skill in creating business writings, and the degree to which these two variables are linearly related, or coincide, with one another. Results are shown in Table 6.

Table 6*Pearson Correlation Coefficient of TBWK and TBWS*

	TBWS
TBWK	
Pearson Correlation	.186
Sig. (2-tailed)	.186
n	52

According to Table 6, the Pearson's r for the correlation between the scores on knowledge and scores on writing was 0.186 and the Sig. (2-tailed) was 0.186, signifying that there was no statistically significant correlation between writing knowledge and writing skill.

Discussions

Results of the testing of the three hypotheses are discussed as follow:

1. In general, inductive teaching, with or without an aid, is an effective instructional method for teaching writing business correspondence. However, particularly in Thailand's context, the findings obtained from t-test analysis of the posttest scores showed a significant difference between the experimental group and the control group. The large magnitude of the difference in the mean scores signifies that inductive teaching approaches, with or without an induction aid, improved Thai students' writing skills; however, students who were assisted with making inductive references were more likely to write significantly better than those who were taught without the inductive aid. The conventional inductive approach, or the inductive teaching without the Induction Helper, presents a loosely related sequence of examples from which learners are expected to observe, discover, and formulate rules on their own. This may result in learners inaccurately conjecturing rules. In addition, the time and energy spent on discovering and

formulating the rules may be at the expense of time and energy spent on applying the rules to writing the pieces (Risniah, 2018; Abdulkarimova & Zubaydova, 2021). Therefore, in order for Thai students to be able to form accurate hypotheses of the rules and use proper time management, they need an aid that contains carefully selected examples and displays a clear sequence demonstrating what they need to observe and discover. In simple terms, the findings of the current study signify that the inductive instructional method without any aids provided to assist students with making inductive references may not be an appropriate method for teaching writing English language business correspondence in the Thai context. This finding is in line with the previous study by Mahrool & Abdullah (2021), which signifies that the inductive teaching method when implemented in a non-native English-speaking country still requires some guidance and assistance. The study found that students feel safe and engaged when they have the teacher to guide and assist them when they have to work out the rules on their own. Likewise, the results of the current study confirm that Thai learners need an aid to assist them to accurately make inductive references.

2. Inductive instructional methods, with or without an aid, help Thai students to retain their knowledge about business writing at a similar level. However, the students who learnt with an aid for making inductive references were more

successful at retaining their writing skills on a long-term basis. This suggests that the Induction Helper given to learners in business English writing courses does not just assist them to make inductive references but also enables them to retain business writing skills on a long-term basis. One goal of instruction in higher education is to produce graduates who are ready for careers. A business writing course provided in higher education needs to ensure that learners retain both the writing theory/knowledge and the writing skills required for their future careers (Sardegna & Slutsky, 2018). Results of the current study also confirms the significance of combining Dual Coding Theory (DCT) (Paivio, 1971) with the Induction Helper. To put it simply, it is vital for a teacher to create a learning aid which can ensure that learners can retain both their knowledge and skills after they have graduated and gone to work in the real-life context. In order for a learning aid to be able to assist the learners retain their knowledge and skills in the long run, it needs to contain features that permit better storage and aids recall. And, the DCT is proved to be able to enhance learners' memory capacity (Sweller, Ayres, & Kalyuga, 2011).

3. Even though the current study found that the intervention - Induction Helper - can boost students' memory and can enable students' retention of the writing skills they acquired from the training over time, the lack of a correlation between their mean scores on the knowledge test and the skill test implies that, in Thailand's educational context, knowledge and skill are separate concepts. Students who do good on knowledge tests, or in other words know about business writing theory, may not be able to create the expected quality of written business documents. This finding signifies the inability of Thai students to apply knowledge into practice. The finding

is in line with the findings from previous study by Hashemiparast, Negarandeh, & Theofanidis (2019), which indicates that there are certain barriers preventing nursing and paramedic students from applying their theoretical knowledge into practice. The study underlines the importance of education in creating links between theoretical knowledge and its practical application in the authentic working contexts. However, the lack of a correlation found in the current study is the opposite of the study by Betretdinova, Kurgaeva, and Kazaryan (2021), which postulated that, regarding business correspondence, knowledge and skills are equally important, and knowledge, or the mastery, of writing theory is the basis for producing effective documents. Another important issue regarding knowledge and skills is the transfer ability, particularly in higher education. According to Jackson, Fleming, & Rowe (2019), an essential role of education is to ensure that the graduates use the skills and knowledge obtained from classroom to operate tasks assigned to them in their future careers. The ability to apply the skills and knowledge signifies the transfer ability, which is a complicated perspective of learning. Inherent here is the implication that if an assisted inductive method can improve students' knowledge of the writing rules, the method also needs to ensure that the students can use that knowledge as the basis for their writing. In other words, there must be a correlation between the knowledge and the integration of that knowledge into practice. The findings suggest that the intervention in the current study still needs further improvement; one of which would be to make the knowledge gained correlate with the skills gained, or to find ways to allow the students to transform their knowledge into practice. Significantly, the intervention needs to forge links between theoretical knowledge and its practical application,

and to ensure the transfer ability of the users-to ensure that the users (the learners) will transfer the knowledge and skills they acquire in their higher education across to their careers (Hashemiparast, Negarandeh, & Theofanidis, 2019; Jackson, Fleming, & Rowe, 2019).

Conclusions

The present study takes an initial step by providing preliminary evidence that inductive teaching approaches with and without induction-assisting tools or guides may generate different outcomes. Even though inductive teaching is claimed to be an effective and efficient method of language learning on a long-term basis, the current study signifies that inductive activities using a mere set of prompt questions from teachers may not successfully enable Thai students to make inductive reference on their own. Taken together, the findings of the current study suggest that there is a role for a concrete guiding aid in promoting inductive reasoning ability. The insights gained in the present study will be of assistance to lecturers of business English writing and to administrators of universities that offer courses on business English writing. In order for a lecturer to create an induction-supportive learning environment for students, they should provide their students with a concrete guide or aid, such as the Induction Helper. Lecturers can adopt the Induction Helper investigated in the present study for their own teaching. However, before providing it to their students, lecturers need to adjust the content and the sample graphics to fit the type of business document they plan to teach students to produce. The preparation of the Induction Helper for each writing topic takes time. Therefore, lecturers need to create the Induction Helpers before the semester starts. Inherent here is the role of the

university's administrators in providing the facilities necessary for the preparation of the Induction Helper. Examples of the needed facilities include providing computers for lecturers to use for the creation of Induction Helper and to access the internet to seek information and sample images, as well as printing and photocopying services so that lecturers can print out and make copies of the Induction Helper for their students. The university also needs to ensure that their lecturers have a clear understanding of inductive reference instruction. This may be accomplished by organizing a workshop or special training on inductive teaching for lecturers, or by allowing lecturers to attend ones offered by outside universities or organizations.

Limitations and Recommendations for Future Research

There are some limitations in this study that should be addressed. Firstly, the sample size is small ($n=52$). This may increase the margin of error and affect the generalizability of the study. Future studies need to include a larger sample size. Secondly, the study chose Thailand as a representative for EFL contexts; so, the findings of the study may be specific to the Thai student population. Future studies need to include participants from other EFL countries if generalization to other EFL contexts is to be possible. It is also recommended that future research should be conducted to investigate what the qualities of the Induction Helper were that helped students to successfully make inductive references. Finally, the distinction between knowledge and skills found in the present study lays the groundwork for future research to explore ways to increase Thai students' ability to transform their knowledge of business writing into writing skills that will allow them to produce quality business writing documents.

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