

Effect of Paper-based Concordance on Thai Low Proficiency English Language Learners' Logical Connector Knowledge^{*}

ประสิทธิผลของการใช้คอนคอร์แดนซ์แบบกระดาษในการพัฒนาความรู้ด้านการใช้คำเชื่อมของ
ผู้เรียนไทยที่มีความสามารถภาษาอังกฤษต่ำ

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Abstract

This study compared the effects of two teaching methods i.e. inductive and deductive. Paper-based concordance was used as materials for participants in the inductive teaching group while the deductive teaching group used traditional teaching materials to learn logical connectors. It also sought learners' opinions towards the usefulness of paper-based concordance. Forty-seven Thai university undergraduates with low English proficiency were divided into the two experimental groups. Two data collection instruments were used: 1) identical pre and posttests ($\alpha=0.75$) and 2) a set of stimulated recall interview questions. Paired T-test was used to analyze the test scores. The results showed a significant improvement of within group comparison (paper-based concordance group $t=6.922$, $p=0.01$, $SD=4.7$) deductive teaching group $t=7.450$, $p=0.01$, $SD=3.91$). However, no significant difference was found in the between group comparison. Interview results revealed that concordance assisted them to gain intuitive knowledge about vocabulary and grammar usage. Additionally, future research may further examine the effect of employing paper-based concordance using deductive teaching approach for low proficiency learners.

Keywords: paper-based concordance, data-driven learning, inductive teaching, logical connector, low proficiency learner

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บทคัดย่อ

วัตถุประสงค์ของงานวิจัยนี้คือเพื่อเปรียบเทียบประสิทธิผลของวิธีสอนสองวิธีได้แก่ การสอนแบบอุปนัยและนิรนัย โดยมีกลุ่มทดลองทั้งหมดสองกลุ่ม คือกลุ่มที่เรียนแบบอุปนัยใช้คอนคอร์แดนซ์เป็นสื่อการเรียน ในขณะที่กลุ่มที่เรียนแบบนิรนัยใช้สื่อการเรียนแบบดั้งเดิมเพื่อเรียนคำเชื่อมภาษาอังกฤษ วัตถุประสงค์อีกประการหนึ่งคือเพื่อศึกษาความคิดเห็นของผู้เรียนที่มีต่อประโยชน์ของการใช้คอนคอร์แดนซ์ กลุ่มตัวอย่างคือนักศึกษาที่มีความสามารถด้านภาษาอังกฤษระดับต่ำจากมหาวิทยาลัยแห่งหนึ่งในภาคใต้จำนวน 47 คน เครื่องมือที่ใช้เก็บข้อมูลมีสองชิ้นคือ แบบทดสอบก่อนและหลังเรียนที่เป็นข้อสอบชุดเดียวกัน ($\alpha=0.75$) และการสัมภาษณ์แบบกระตุ้นความจำ ผู้วิจัยใช้ Paired T-test เพื่อวิเคราะห์คะแนนที่ได้จากการทดสอบก่อนและหลังเรียน ผลของการวิเคราะห์การเปรียบเทียบคะแนนภายในกลุ่มของทั้งสองกลุ่มพบว่า ผู้เรียนมีพัฒนาการด้านการใช้คำเชื่อมที่ดีขึ้นอย่างมีนัยสำคัญ (กลุ่มที่เรียนด้วยสื่อการสอนคอนคอร์แดนซ์ $t=6.922$, $p=0.01$, $SD=4.7$ และกลุ่มที่เรียนด้วยวิธีดั้งเดิม $t=7.450$, $p=0.01$, $SD=3.91$) แต่ไม่พบความแตกต่างในการเปรียบเทียบระหว่างกลุ่ม ข้อมูลจากการสัมภาษณ์พบว่าคอนคอร์แดนซ์ช่วยให้ผู้เรียนมีความสามารถในการเรียนรู้คำศัพท์และไวยากรณ์ได้อย่างเป็นธรรมชาติ ในการทำวิจัยครั้งต่อไปควรศึกษาประสิทธิผลของการใช้คอนคอร์แดนซ์เป็นสื่อการสอนแบบนิรนัยกับผู้เรียนที่มีความสามารถด้านภาษาอังกฤษต่ำ

คำสำคัญ: คอนคอร์แดนซ์แบบกระดาน, การเรียนภาษาผ่านคลังข้อมูลภาษา, การเรียนแบบอุปนัย, คำเชื่อมภาษาอังกฤษ, ผู้เรียนที่มีความสามารถด้านภาษาอังกฤษต่ำ

Introduction

1. Background of the Study

Grammatical knowledge is believed to be difficult to acquire among foreign language learners (Limtrairat & Aksornjarung, 2015). It has been found that common grammatical errors are subject verb agreement, determiners, tenses and logical connectors (Jenwitheesuk, 2009; Prommas & Sinwongsuwat, 2013) which are caused by the lack of awareness in grammatical rules, L1 interference, and the lack of knowledge in sentence formation. Such causes may result in writing errors including non-existence of verbs in clauses, producing run-ons, and misusing logical connectors (LC) semantically (Prommas & Sinwongsuwat, 2013).

There are several factors that could cause the problems above. One of the factors could be teaching methods. According to Limtrairat and Aksornjarung (2015) and Nonkukhetkhong, Baldauf and Moni (2006), Thai teachers still use deductive teaching methods including translation, grammar explanation and vocabulary explanation even in the so called communicative language English teaching era. This method is known as a teacher-centered approach which normally taught by providing rules to learners with some examples and asking them to practice through exercises.

Inductive teaching method is a method that can help learners become more autonomous (Boulton, 2009a, Johns, 1991). It is more student-centered since learners are encouraged to construct their own knowledge which requires several cognitive skills such as “predicting, observing, noticing, thinking, reasoning, analyzing, interpreting, and reflecting” (O’Sullivan, 2007, p.277). Such skills may in turn lead to longer retention (Laufer & Hulstijn, 2001).

Data-driven learning or DDL is an example of inductive instruction, encouraging learners to search a target language item through a search engine – corpus. After the search, learners form hypotheses about rules or meaning of the target language item from a large amount of authentic data presented in concordance lines. Several studies (Chujo, Anthony, Oghigian & Uchibori, 2012; Garner, 2013; Koosha & Jafarpour, 2006; Smart, 2014) established that DDL was helpful in improving students’ grammatical ability such as prepositional collocations, linking adverbials, and passive voice.

Many studies have found that DDL is more useful for advanced learners, which might lead to a misconception that DDL is not suitable for low proficiency learners because of the small number of studies conducted with low level learners (Boulton, 2010). The other reason could be that low proficiency learners have inadequate linguistic knowledge to analyze a large amount of data in KWIC format. Therefore, hands-on corpus work may not be practical for them, particularly the truncated concordance lines for vertical reading which is confusing to interpret or draw conclusions (Boulton, 2009b; Lamy & Klarskov Mortensen, 2012). Another concern over online concordance and low level learners is that DDL is more suitable for extending learners’ linguistic experience (Cobb, 1999). Paper-based concordance is, thus, recommended as an alternative for low proficiency learners because it can be simplified or modified to create a more user-friendly materials (Lamy & Klarskov Mortensen, 2012).

Nowadays, graduates are required to take the TOEIC test for job applications. Low English proficiency learners have found it difficult to take such test. Paper-based concordance can be used in teaching grammatical points inductively to low level learners which might result in learners’ becoming more autonomous in learning. Thus, the present study aimed to investigate the effect of paper-based concordance on low English proficiency university students’ grammatical knowledge with special reference to LCs. The results of this study might contribute to the literature about using paper-based concordance to enhance learners’ grammatical items inductively. The following research questions were addressed:

1. Were there any differences between deductive teaching group and inductive teaching group after 15 weeks of paper-based concordance instruction?

2. What were the participants' opinions towards the use of paper-based concordance materials to induce LCs meaning?

2. Logical Connectors

LCs are used to show cohesion and coherence. They logically connect ideas to indicate relationships of surrounding discourse units or to make a stronger persuasive claim (Mauranen, 1993). Logical connectors are divided into three categories namely coordinating conjunction, subordinating conjunction and transitions. Coordinating conjunctions are used in connecting two independent clauses and transforming them into a compound sentence. Subordinating conjunctions are used in creating complex sentences connecting a dependent and an independent clause together. Transitions or linking adverbials are used in linking two independent clauses forming a compound-complex sentence.

The latter two seem to be the ones that most ELLs have problems with probably because there is more than one way to link sentences with these LCs, and there are many connectors that have similar meanings (Celce-Muria & Larsen-Freeman, 1999; Liu, 2008). Flowerdew (2001) and Garton (1996) found dissimilarities between the authentic usage of native speakers and the ways LCs are traditionally taught. Boulton (2009b, p.42) maintained that “for successful mastery of such items [LC], learners would seem to need something more than what can currently be found in standard materials”.

Previous studies also indicated the problem of misusing, overusing and underusing LC among high and low proficiency learners (Boulton, 2009b). One of the factors that could cause such usage problems is language transfer of learners' mother tongue (Granger & Tyson, 1996). Habits of transfer of learners' first language or direct translation play an important role for learners to misuse and overuse connectors. For example, Granger and Tyson (1996) found; the overuse of “indeed” by French speakers was caused by the assumption in the equivalent of the common connector of French “en effet”. In the study of Prommas and Sinwongsawat (2011), Thai learners used the word “but” redundantly with other connectors such as *although* and *even though*. This could partly be because of the influence of their mother tongue that allows the constructions of “although...but”.

3. Paper-based concordance and DDL

Sinclair (1991) defined concordance as “a collection of the occurrences of a word-form, each in its own textual environment” (p.32). To get the concordance, searches need to be made on a website or software through a source of writing collections – corpus. One single query allows the searcher to obtain concordance lines in KWIC (Key Word in Context) format where the search word or phrase would appear in the middle of the concordance lines, highlighting the focused language items. Typographical cues such as italicizing, underlining, boldfacing or color-coding are also applied. Such emphasis in KWIC format may increase the saliency of the target word, and draw learners’ attention that may be needed for subsequent learning to take place (Leow, 1999; Robinson, 1995; Schmidt, 1990). This format allows learners to see usual surrounding words in authentic contexts.

Similar to online concordance, paper-based concordance also contains sentence samples in KWIC format retrieved from a corpus. Searches can be made in advance to provide authentic data for learners to examine. Printed concordances are beneficial and practical in several ways. First, they can be modified to suit low level learners’ linguistic background by removing confusing examples as well as applying typographical cues to emphasize target items (Boulton, 2010; Chujo, et al., 2012). Second, tasks are more time-efficient since the materials are pre-designed and ready to be understood. Using paper-based concordance allows learners who are not used to inductive learning to set their own pace in the concordance investigations (Turnbull & Buston, 1998). Moreover, it is more accessible and convenient to use concordance printouts in teaching or as preparation before moving on to hands-on concordancing (Lamy & Klarskov Mortensen, 2012).

Data-driven learning is a corpus-based learning, which requires learners to be active in their learning process. According to Boulton (2009a) the core elements of DDL is for learners to be able to go through some cognitive processes such as exploring concordance, detecting patterns, forming hypotheses and inducing rules on their own. Such process could lead to a better understanding and longer retention (Laufer & Hulstijn, 2001). This way of learning could help learners to become more autonomous outside classrooms (Johns, 1991).

Even though many studies have demonstrated that to a certain extent DDL is beneficial in language teaching, it is not yet widely embraced (Boulton, 2010). This may be because the approach is considered “mechanical, laborious, and tedious” (Chambers, 2007). In other words, studying one item requires learners to go through several processes such as searching queries using computers, observing concordance lines and hypothesizing. To make the lessons less tedious, it is suggested that DDL activities should take no more than 30

minutes in each class (Whistle, 1999). The tasks assigned should be various, and not require learners to rely too much on concordancing (Allan, 2006).

4. Guided induction for using concordance

In addition to learning LCs from concordance printouts, low level learners and beginners may also need teacher guidance. A proposed guided teaching approach includes four stages in teaching, namely illustration, interaction, intervention and induction (Carter and McCarthy, 1995; Flowerdew, 2009).

Illustration, the first “I”, is the first stage in which learners are exposed to authentic data in concordance lines. The concordances serve as language input so that learners can observe salient target forms. Then, the second “I” stage, interaction helps raise learners’ consciousness through class activities. With the activities, learners are encouraged to discuss or share ideas so that they can form their hypothesis on the target language items. However, low level learners might need teacher intervention to provide hints or prompt questions to help them form hypotheses. The hint could be “Do you notice any difference in the subjects for was decreased and has decreased?” (Flowerdew, 2009 p. 407). The last important step is induction or the step that learners discover forms and meanings of the target items.

Methodology

The data was collected both quantitatively and qualitatively. The quantitative data was obtained from scores of pretests and posttests to investigate the difference of learners’ ability in using the target LCs while the qualitative data was obtained from stimulated recall interviews.

1. Participants

The participants of this study were taken from two intact groups who enrolled in an “Introduction to English Writing” course at a university in southern Thailand. They were 3rd and 4th year students aged 21-22 years old from different faculties. Group one consisted of 30 students, and group two 34 students. After taking a placement test, only 20 from group one and 27 from group two totaling 47 were chosen as the participants. Thirteen of them were male and 34 were female. Group one was assigned as paper-based concordance group (PC group), and group two was assigned as deductive group (DT group). Their proficiency was classified to be at elementary level based on the results of printable commercial placement test provided by Longman. None of them knew about language corpora or paper-based concordance prior to the study.

2. Instruments for preliminary stage

2.1 Placement test. An online printable placement test was used to judge learners' proficiency. The test contained 100 multiple choice questions focusing mainly on grammar. The test lasted one hour. The criteria, **provided by the publisher**, are as follows: 0-20 points = below Elementary, 21-35 points = elementary, 36-60 points = pre-intermediate, 61-85 points = Intermediate, 86-100 = upper Intermediate.

2.2 Vocabulary assessment form. The form was adapted from the Vocabulary Self-assessment Scale introduced in Core Instructional Routines: Go-To Structures for the 6–12 Classroom (Honigsfeld & Dodge, 2016). It was a four-scale questionnaire asking learners to assess their LC knowledge ranging from *I have never heard or seen this word before* to *I know this word and I am sure I can use it correctly*. The form, translated into Thai, was used to identify target LCs out of 30 uncommon LCs. Top ten most frequently unknown words were *in order to*, *whereas*, *due to*, *despite*, *instead of*, *as well as* (subordinating conjunctions), *in fact*, *as a result*, *in contrast*, and *nevertheless* (transitions).

3. Instruments for pre-experimental stage

3.1 Grammar revision handouts. The handouts were for reviewing basic grammatical aspects necessary for learning LCs inductively. As the students were required to work on the overall meaning of each sentence sample on their own, the handouts were essential in that they provided fundamental grammatical knowledge and could help students to analyze as well as translate the sentences while working in pairs. The content in the handouts included part of speech, verb phrase, noun phrase, adjective clause, noun clause and some exercises. The revision took seven sessions.

3.2 Concordance training handouts. The handouts were for familiarizing the PC group with concordance lines in KWIC format as well as introducing DDL method i.e. encouraging them to discuss and observe grammatical aspects (e.g. logical relationships of the messages surrounding the LC, punctuation marks, and whether the messages are clauses or phrases), interpreting meanings, and hypothesizing. The handouts contained concordance lines in KWIC format and exercises. In total, three handouts were used for three training sessions.

4. Instruments for experimental stage

4.1 Logical connector handouts. The handouts for DT groups contained 10 sets of LC. Each set consisted of three LCs (two LCs and one target LC). Each handout comprised two parts, namely detailed explanation and exercises. The explanations were in L1 concerning its grammatical usage along with sentence samples. Exercises were constructed using the sentence samples from the concordance of the PC group. They contained 10-15 items.

4.2 Paper-based concordance. One page of the concordance printouts contained the same set of the three LCs from the DT group. Each printout contained seven pre-selected concordance lines of each LC, totaling 21, which were selected from online dictionaries corpora and an online corpus from www.lex Tutor.ca (e.g. Graded Readers, Brown). The concordance lines were simplified to suit learners' proficiency. Unlike examples of many online concordancer, the sentence samples were single complete sentences listed in tables as shown in Figure 1.

4.3 Exercise worksheets. Two different exercise worksheets were designed for the interaction and induction phases of PC group. Worksheet 1 contained seven questions serving as a tool to guide learners to induce correct meaning of LCs by studying grammatical aspects as trained in the pre-experimental stage. Worksheet 2 contained an exercise of 6-10 items and was made into 10 versions for 10 sets of LCs containing various tasks such as gap-filling, error correction and sentence linking. Both worksheets were planned to be completed within 30 minutes.

Logical Connectors (Set 1)	
In order to	
1.	I love listening to the sound of rain in order to fall asleep easily.
2.	I set up this blog in order to keep my friends and family informed of my time in Hanoi.
3.	You must set up an online account in order to view, save and print documents.
4.	You have to find a job and apply for a work permit in order to stay in this country.
5.	In order to identify if the rice is real or fake, you should boil it.
6.	He came home early in order to see his children before they all went to bed.
7.	Soon you will receive an email, which you need to confirm in order to complete your registration process.
Unless	
1.	Unless some extra money is found, the business will close.
2.	Don't visit at home unless it's absolutely necessary.
3.	Unless the weather improves, we will have to cancel the football match.
4.	Don't use smartphones during class unless you get my permission.
5.	Unless it rains, we'll go to the beach tomorrow.
6.	You can't play a computer game unless you finish your homework.
7.	Unless she had permission from her parents, she wouldn't go abroad alone.
Otherwise	
1.	Ben is not motivated by money, otherwise he would have quit the job.
2.	You'll have to go now, otherwise you'll miss your English class.
3.	Maria must have been very sick, otherwise she'd be here by now.
4.	Write it down in your notebook, otherwise you'll forget it very soon.
5.	My friend has to listen to soft music for a while, otherwise she can't sleep.
6.	I have to say this before I start working otherwise I'll forget.
7.	Thank you for telling me about the concert being cancelled. Otherwise, I'd have travelled all the way to Bangkok for nothing.

Figure 1 Example of paper-based concordance handouts

5. Data collection instruments

5.1 Pre and posttests. The tests were constructed based on the TOEIC test format of part V “Incomplete Sentences”, that is, gap-filling test items with four choices. The stems were adapted from existing online dictionary corpora. The subject matter of the test items was also similar to the ones in TOEIC. Both pre and posttest were identical ($\alpha=0.75$).

5.2 Stimulated recall interview. To investigate participants’ inductive learning process, stimulated recall interviews were conducted in Thai using paper-based concordance, Worksheet 1 and 2 as the stimulators. Participants were interviewed in pairs for 20-30 minutes. The examples of the questions were: *Was KWIC format useful in learning the connectors?*, *What was the first thing you did when you got the concordance printouts?*, and *How did you choose the sentence samples to translate?*

6. Procedures

The study was carried out for one semester. The two-hour class met twice a week. However, the teacher researcher was responsible for teaching LCs for the last 30 minutes only. The total number of experimental sessions was 25 classes. The research procedures were divided into four stages as follows:

Preliminary Stage. In the first stage, a free online English placement test was administered for one hour. After taking the test, the participants were asked to fill in the vocabulary assessment form.

Pre-experimental Stage. This stage consisted of three parts: pre-test, grammar revision, and the concordance training. Firstly, the participants took a pre-test lasting 45 minutes. Then, in the next seven sessions, the researcher reviewed necessary grammatical items. The concordance training was three sessions long.

Experimental Stage. The experimental stage comprised 12 sessions. For DT group, the researcher used the deductive teaching approach throughout the treatment to explicitly explain in L1 all rules and meanings of the target LCs. After individual participants completed the exercises, the researcher provided answers and detailed explanation, and learners were allowed to take the handouts home. The teaching approach for the PC group, on the other hand, was more student-centered. In that, the researcher employed 4Is instruction. The participants were asked to work in pairs throughout the whole course.

For each set of LC learning, in the illustration phase, participants were required to observe the structures of sentence samples, and then discuss in interaction phase to complete Worksheet 1. After that, in the induction phase, they collaboratively induced the meaning of the target LCs to complete the exercises on Worksheet 2. At the same time, the researcher

intervened but only when she noticed that the participants were struggling with inducing meaning of LCs. However, this intervention phase was optional. When the participants finished doing the exercises, the researcher provided answers by explaining the usage and the meaning of the LCs. The handouts and worksheets of this group were collected by the researcher for further analysis.

Post-experimental Stage. In this stage, all the participants took immediate posttest for 45 minutes. Subsequently, two weeks after that stimulated recall interviews were conducted. Only six pairs of participants who took part in all learning sessions were interviewed.

Results

Research Question 1: Were there any differences between deductive teaching group and inductive teaching group after 15 weeks of paper-based concordance instruction?

Due to the small size of participants from both groups, it was necessary to test the normality of the distribution of pretest scores before employing independent T-test. The results revealed that the scores distributed normally.

The results in Table 1 showed that the pretest scores of both groups were not different ($t=1.778$, $p=0.082$) indicating that the participants had the same level of proficiency. Posttest scores were used to compute between group and within group comparison. For within group comparison, the results of Paired t-test showed significant increases in the posttest scores of both groups. That is, the score of the PC group increased from 9.65 in the pretest to 14.50 in the posttest with 4.85 of scores difference ($t=6.922$, $p=0.01$). Likewise, the score of the DT group increased from 8.22 in the pretest to 14.11 in the posttest with 5.89 of scores difference ($t=7.450$, $p=0.01$).

For between group comparison, the difference of posttest scores was not significant ($t=0.309$, $p=0.76$) with small effect size (Cohen's $d = .092$). The gain score of the DT group (27.04%) was slightly higher when compared to the PC group (23.83%). The results suggested that paper-based concordance instruction was as effective as deductive instruction.

Table 1 Comparison of test scores between PC and DT groups using T-test.

Table 2 summarizes the five most problematic LCs of both deductive and inductive groups. Thirty test items were used to test ten target LCs. In other words, one LC was tested through three gap-filling items. Incorrect items of each connector were counted to obtain the top five problematic LCs. The five most problematic LCs of the inductive group included five connective prepositions i.e., *despite* (15), *due to* (11), *in order to* (11), *as well as* (10), *instead*

of (10) and two transitions i.e., *nevertheless* (14) and *in fact* (13). Similarly, out of the five problematic LCs of the deductive group, three were connective prepositions i.e., *despite* (23), *as well as* (16), and *instead of* (16). One was subordinating conjunctions i.e., *whereas* (14), and the other three were transitions i.e., *in fact* (18), *nevertheless* (18), and *as a result* (15).

Table 2 Top five most problematic LCs in the posttests of both inductive and deductive groups

Inductive group			Deductive group		
Rank	Logical Connector	No. of participants (n=20)	Rank	Logical Connector	No. of participants (n=27)
1	Despite	15	1	Despite	23
2	Nevertheless	14	2	In fact	18
3	In fact	13	3	Nevertheless	16
				Instead of	
				As well as	
4	Due to	11	4	In contrast	15
	In order to			As a result of	
5	As well as	10	5	Whereas	14
	Instead of				

From the data available, Table 3 shows the number of students of PC group making mistakes in all exercises. It can be seen that the students had difficulties with *in fact*, *despite*, *instead of* and *in contrast* when compared to other LCs.

Table 3 Most frequent mistakes in the exercises made by PC group

Test	PC (n=20)		DT (n=27)		Independent t-test			Effect size (Cohen's d)
	Mean	S.D.	Mean	S.D.	t	df	p	
Pre	9.65	2.41	8.22	2.93	1.778	45	0.082	
Post	14.50	4.7	14.11	3.91	0.309	45	0.76	0.092
Gains(Post-Pre)	4.85	3.13	5.89	4.11	0.945	45	0.35	
Paired t-test	t=6.922, p=0.01		t=7.450, p=0.01					
Relative Gains Score (%)	23.83		27.04					

Rank	Logical connector	Number of participants making mistakes in the exercises (n=20)
1	Due to	2
2	In fact	7
3	Despite	7
	Nevertheless	4
4	Instead of	8
5	In contrast	6

Research Question 2: What were the participants' opinions towards the use of paper-based concordance materials to induce LCs meaning?

Regarding the usefulness of paper-based concordance lines, the results of stimulated recall interviews showed that KWIC format in the concordance was helpful in increasing LC knowledge. They allowed learners to see more examples than when they studied grammar through traditional methods. The variety of the sentence samples helped broaden their knowledge in terms of sentence patterns as to whether the LCs can be followed by a phrase or a clause and that some of them can be placed in three different ways (i.e. sentence-initial, medial, and final position). These points can be seen in the following excerpts:

I could see many examples. Normally, I don't see this many when learning one word...

Now I know the connectors can be used in many ways.

(Pattharawadee*, interviewed on the 30th November 2016)

It was quite easy to notice different positions of each connector and their punctuation marks.

(Rattapong*, interviewed on the 1st December 2016)

The structure was clearer to see with this format... It was very useful. Usually I'm not aware of the types of messages in front of the connector. Whether they are phrases or clauses, I never notice them... This format was quite easy to find subjects and verbs in the surrounding clauses too.

(Teeraphat*, interviewed on the 30th November 2016)

Learners also reported that having many sentence samples in their hands helped them induce LCs' meaning better. In other words, they can rely on their intuition to decide L1 meaning of each LC. In addition, they were able to refer to an easier concordance lines when they could not translate the more difficult ones. These points can be seen in the following excerpts:

I think it's good to have many sentences. They were helpful when we were not sure of the Thai equivalence of a connector... We can compare several Thai words for one connector and see how they sound...

(Anticha[†], interviewed on the 9th December 2016)

If there was only one example per connector, and we cannot understand the meaning of the sentence. Then, that would be the end of the story... Seeing one connector in one position makes us think that that is the only way of using connector... Because our background knowledge is poor, we wouldn't know that a connector can be place in other positions.

(Pongpob*, interviewed on the 28th November 2016)

* Pseudonym
*Pseudonym

Discussion

It can be concluded from the results above that the ability in using LCs of both groups improved significantly after the treatment. However, whether deductive or inductive instructions was more effective is still inconclusive. The LCs that were found to be problematic for PC group are *due to, nevertheless, instead of, in fact, despite, and in contrast*. The findings of this study are in accordance with the study of Boulton (2010) who found that paper-based concordance instruction is as effective as deductive methods for French learners.

There are four possible reasons to explain why the participants in both groups demonstrated similar learning outcomes. First, the DT group was already familiar with deductive teaching. That is, teachers explicitly explain each grammatical item point by point along with few examples, and ask students to do grammatical exercises. In contrast, PC group might not be familiar with inductive instruction because Thai students, like students in many Asian countries, have been used to deductive teaching (Nonkukhetkhong et al., 2006; Yoon & Hirvela, 2004). In this study, the PC group were required to go through corpus-based activities on their own and were allowed to consult the teacher when encountering difficulties only.

Second, paper-based teaching materials were also novel to the learners. This could be difficult for any learners who have been used to deductive instruction regardless of their proficiency. Therefore, being exposed to new teaching methods and materials simultaneously would even be more difficult for low proficiency learners. As argued by Boulton (2010), even in perfect learning conditions, it is unreasonable for low proficiency learners to understand the lessons taught by inductive method better than in a traditional classroom setting.

Another reason could be the adoption of intervention phase as optional. Proposed by Flowerdew (2009), intervention should be done to providing hints to learners so that their problems are eliminated. It goes without saying that low proficiency learners need more help from teachers. In this study the teacher intervened only when learners asked. In fact they might have needed more teacher attention. According to Kirschner, Sweller and Clark (2006), a purely inductive approach is not suitable for DDL beginners with low proficiency because they have insufficient background knowledge to draw on (Kirschner et al., 2006) or otherwise they draw faulty conclusions (Boulton, 2010).

Although it was suggested by Whistle (1999) and Allan (2006) that corpus-based lessons should not last longer than 30 minutes because it might result in boredom, in this study, the participants were low proficiency learners, and they had only 30 minutes to learn new language items from paper-based concordance. According to Cobb (1999), concordance is

more suitable for learners to broaden their linguistic repertoire rather than establishing new knowledge.

Looking closely at the mistakes in the posttest, it can be seen that over half of the underused LCs were categorized under contrast (i.e. in fact, despite, in contrast, nevertheless, instead of). This problem was also found in the exercises. A plausible explanation for this is that it is quite uncommon among learners to be able to make sense of adversative statements because they appear too complicated. Altenberg and Tapper (1998), Granger and Tyson (1996), and Lei (2012) also found these adversative LCs underused in their studies.

Despite paper-based concordance to be problematic, it was found beneficial to a certain degree. A conclusion that could be drawn from the stimulated recall interviews was that KWIC format helped LCs become more noticeable to learners. Most of them reported that the bold-faced LCs of the concordance lines attracted their attention first, resulting in the ability in inducing LCs' meanings. It also helped them gain more grammatical knowledge because students were exposed to more examples than what they learned in deductive teaching. The result of this study was supported by Levy (1990) who maintained that providing multiple examples could help broaden learners' linguistic experience. In Boulton's study (2010), participants found concordance useful because concrete examples helped them gain intuitive knowledge about grammatical usage and vocabulary.

Conclusion and pedagogical implication

This study investigated learners' ability in learning LCs through the use of PC. Two different teaching methods were employed. The results suggested that both deductive and deductive methods were equally effective. The participants found paper-based concordance useful in increasing their ability to use LCs intuitively.

Pedagogical implications can be offered: 1) suitable class time for low proficiency learners should be longer than 30 minutes; 2) the teacher should intervene more often, that is, while doing the exercises, the teacher should provide explanation after each exercise is completed; and 3) when choosing sentence samples from certain corpus, some corpus such as Graded Readers might contain easier vocabulary and grammatical structure, but it is highly contextualized. Therefore, for low proficiency learners, concordance lines should not require too much background knowledge.

Recommendations for further research

As demonstrated in the findings that deductive instruction was slightly more effective for low proficiency learners, perhaps future research could further examine how guided-inductive instruction affect low proficiency learners' ability. In other words, teachers use paper-based concordance materials and provide elaborate specific guidance so that learners can eventually induce meaning on their own.

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