Data-Driven Learning and Low Proficiency Learner's Capacity for Self-Correction on Grammar

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Abstract

There has been growing use of the application of corpora in language teaching, an example of which is enhancing learners' capacity to employ concordances to correct grammatical errors in their own writing. This study, conducted from May-October 2009, qualitatively and quantitatively investigated the effect of using concordances on 37 Thai EFL low-proficiency learners' ability to correct their own grammatical errors in error-correction tasks. The learners were asked to compose a 150 word-long story, prompted by a series of pictures. The five most common errors were then identified; nouns, verbs, prepositions, articles, and subject-verb agreement. As part of the experiment, the researcher used three similar stories to train the learners to notice certain linguistic forms on concordance outputs and to correct the identified errors based on patterns they induced. Post-test and retention test were used to measure their ability to correctly induce grammatical rules. Stimulated recall interviews were employed to gather information in relation to strategies they adopted to inductively discover grammatical rules in order to correct the errors. The main findings obtained from pair sample T-test showed that among the five types of errors, subject-verb agreement was corrected the most accurately whereas preposition

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and verb were the least prevalent errors corrected by learners. The results from qualitative analyses revealed different levels of noticing contributed to different types of grammatical pattern induction. The difficulty of self-correction experienced by learners was exacerbated by internal factors (lack of background knowledge and lack of confidence in using the concordances), and external factors (the number of concordance lines that can be consulted, the complexity of the concordance lines, and L1 interference).

Keywords: *Data-Driven Learning, Concordances, Low-Proficiency Learners*

ความสามารถในการเรียนรู้ด้วยวิธีข้อมูลขับเคลื่อนเพื่อแก้ไขข้อผิดพลาดทางด้านไวยากรณ์ด้วยตนเองของนักเรียนที่มีความสามารถทางด้านภาษาอังกฤษในระดับต่ำ

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บทคัดย่อ

ปัจจุบันได้มีการนำคลังข้อมูลภาษามาใช้ในการสอนภาษาอังกฤษเพิ่มมากขึ้น ตัวอย่างเช่น การเพิ่มความสามารถด้านการเรียนโดยการใช้คอนคอร์แดนซ์เพื่อแก้ไขข้อผิดพลาดทางด้านไวยากรณ์ของผู้เรียนด้วยตนเอง งานวิจัยชิ้นนี้เริ่มการทดลองตั้งแต่เดือนพฤษภาคมจนถึงตุลาคม 2552 โดยมีการเก็บข้อมูลทั้งเชิงคุณภาพและเชิงปริมาณเพื่อศึกษาผลกระทบของการใช้คอนคอร์แดนซ์เพื่อแก้ไขข้อผิดพลาดทางด้านไวยากรณ์ของนักเรียนไทยที่มีความสามารถทางด้านภาษาอังกฤษในระดับต่ำจำนวน 37 คน การทดลองเริ่มจากนักเรียนกลุ่มตัวอย่างจะแต่งเรื่องจากภาพจำนวน 150 คำ จากนั้นผู้วิจัยได้ทำการตรวจและหาข้อผิดพลาดด้านไวยากรณ์ที่มากที่สุด 5 ตัว ได้แก่ นาม กริยา บุพบท คำนำหน้านาม และประธานและกริยาที่สอดคล้องกัน ในช่วงระหว่างการทดลองผู้วิจัยได้ทำการสอนให้นักเรียนสังเกตและเรียนรู้ไวยากรณ์จากคอนคอร์แดนซ์ โดยใช้ชิ้นงานสามชิ้นในการฝึกการเรียนรู้กฎไวยากรณ์เพื่อแก้ไขข้อผิดพลาดที่กำหนดให้โดยใช้กฎไวยากรณ์ที่ได้จากการสังเกตหลังจากนั้นผู้เรียนจะต้องทำแบบทดสอบหลังเรียนและแบบทดสอบวัดความทรงจำเพื่อวัดความสามารถทางด้านการเรียนรู้ นอกจากนี้ ผู้วิจัยได้ทำการสัมภาษณ์ผู้เรียนเพื่อเก็บข้อมูลในเชิงลึกในเรื่องกลยุทธ์ของการเรียนรู้ไวยากรณ์ของผู้เรียน ผลการทดลองแสดงให้เห็นว่าจากไวยากรณ์ที่ได้ศึกษาทั้งห้าประเภท ความผิดของไวยากรณ์ประเภทการใช้ประธานและกริยาที่สอดคล้องกันเป็นไวยากรณ์ที่ผู้เรียนแก้ไขได้มากที่สุด ในขณะที่ความผิดของไวยากรณ์ประเภทบุพบทและกริยาเป็นไวยากรณ์ที่แก้ไขได้น้อยที่สุด ข้อมูลในเชิงคุณภาพแสดงให้

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เห็นถึงความแตกต่างของการเรียนรู้ไวยากรณ์แต่ละประเภท ปัญหาที่พบในการแก้ไข
ข้อผิดพลาดของผู้เรียนเกิดจากผลกระทบจากปัจจัยภายใน (ขาดความรู้ที่เพียงพอและขาด
ความมั่นใจในการใช้คอนคอร์แดนซ์) และผลกระทบจากปัจจัยภายนอก (จำนวนคอนคอร์แดนซ์
ที่ใช้ในการเรียนรู้ ความซับซ้อนของคอนคอร์แดนซ์ และการแทรกแซงของภาษาไทย)

คำสำคัญ: การเรียนรู้โดยใช้ข้อมูลขับเคลื่อน คอนคอร์แดนซ์ นักเรียนที่มีความสามารถ
ระดับต่ำ

Introduction

Thailand, like other developing countries, has long been attempting to promote English language teaching in every level of education. However, it has been facing problems related to English education which is similar to other Asian countries (Punthumasen, 2007; Wiriyachitra, 2002) in that English is the first foreign language which has been taught only at school. Many Thai English teachers have been used the traditional style of language teaching from the time they themselves were school students and found it too difficult to change. Hence, they often teach the same way as they were taught (Udomyamokkul, 2004). That is, in teaching grammar, a teacher uses deductive teaching method in that he explains rules of the language and learners have to memorize the rules. After that the students do the exercises on grammar to practice using the rules. Moreover, most of the exercises are from the traditional grammar book which contains the isolated sentences to practice using grammatical rules. The language used is artificial and unrealistic. This teaching method results in students only recognize grammatical aspects but are unable to use them correctly (Musigrunsi, 2002) and do not have much opportunity to practice English outside class (Khamkhien, 2010). Moreover, the students can not take their responsibility for their own learning which is very important to promote the goal of English language learning, life long learning. The findings from many studies showed that grammar problems have resulted in the low English achievement of Thai students (Sattayatham & Ratanapinyowong, 2008; Onodera, 2007; Udomyamokkul, 2004).

Recently, there has been an increasing number in using concordances for grammar learning. The results from several studies revealed the number of successful scenarios in which concordances can be a tool in teaching grammar (O'Sullivan & Chamber, 2006; Yoon and Hirvela, 2004; Wang; 2001; Todd, 2001). Using these materials in classroom learning, learners can play the important roles in learning inductively which is the basic principle of life-long learning. However, some scholars have posited that advanced learners benefit from using concordances more than learners at a low level of language proficiency (Conrad, 2005; Hunston, 2002) and as the concordances are still not widely used by Thai English teachers. Therefore, the objective of this study is to investigate whether Thai low proficiency

EFL learners using concordances to learn grammatical rules, and recommend ways for using concordances more effectively in the classroom.

Theoretical Background

Over the past couple of decades, computer corpora and concordances have become one of the most promising modes in computer-assisted language learning, and a great number of corpus-based studies have become well-known in the field of applied linguistics and language teaching (Boulton, 2008; Lewis, 2000; Cobb, 1999).

Corpus (corpora in plural form) is a vast and organized set of authentic texts of different kinds stored and processed mainly on computers. These texts can be from written sources and spoken language such as books, magazines, junk mail, letters, everyday conversations, university classes, television and radio programs. To work with these electronic databases, a search engine called concordancer is used to search for the corpora outputs. The results from concordancer search are called concordances which are alphabetical lists of the occurrences of a key word or phrase in context, drawn from a text corpus and show every contextual occurrence of the word or phrase.

In using concordances for English language learning, students can easily observe and notice how the words appear in sentences (Turnbull & Burston, 1998). By noticing, the students can learn how to induce the patterns from concordance lines. This learning process, termed by Johns (1991) as "Data-Driven Learning" (DDL), is learning process in which learners are assisted by the authentic language information delivered to them by the search engine in the form of concordance lines. DDL changes the traditional roles played by teachers and students in the classroom. The teacher is no longer a resource of knowledge, but a facilitator, a guide or a supervisor. In turn, the students become more active, autonomous, and responsible, since they take on the role of researchers, capable of asking themselves questions, analyzing data, and drawing conclusions from language data presented in concordance lines.

According to Chujo and Oghigian (2008), to be successful in using DDL approach in English classroom, teachers should include the four steps of teaching;

(1) allowing students to formulate the rules from concordances; (2) explaining or correcting the students' patterns induction; (3) providing the follow-up exercises to check the students performance and test their understanding; and (4) allowing students to produce the language. Through this procedure of learning, cognitive processes such as noticing, comparing and integrating hypothesis formation which is necessary for learning L2 grammatical forms can help learners to develop skills effectively (Ellis, 1997). That is, SLA is largely driven by what learners pay attention to and notice in target language input and what they understand the significance of noticed input to be. According to Schmidt and Frota (1986 cited in Thornbury, 1997), there are two crucial types of noticing conditions which are necessary for acquisition. Firstly, learners have to attend to linguistic features of the input that they are exposed to, with out noticing condition the input will not become intake. Secondly, learners have to 'notice the gap' which acquisition can be occurred. They have to notice a difference between their current state of form or competence, as realized in the output, and the target form or structure, input.

Ellis (1997) suggested that the knowledge can become implicit knowledge if the learners work on the following stages:

1. Noticing (i.e. paying attention to the target structure in the input).

2. Comparing (i.e. comparing the noticed structure with the typically presents in output).

3. Integrating (i.e. modification of their interlanguage system by using the obtained information from their noticing and comparing stages).
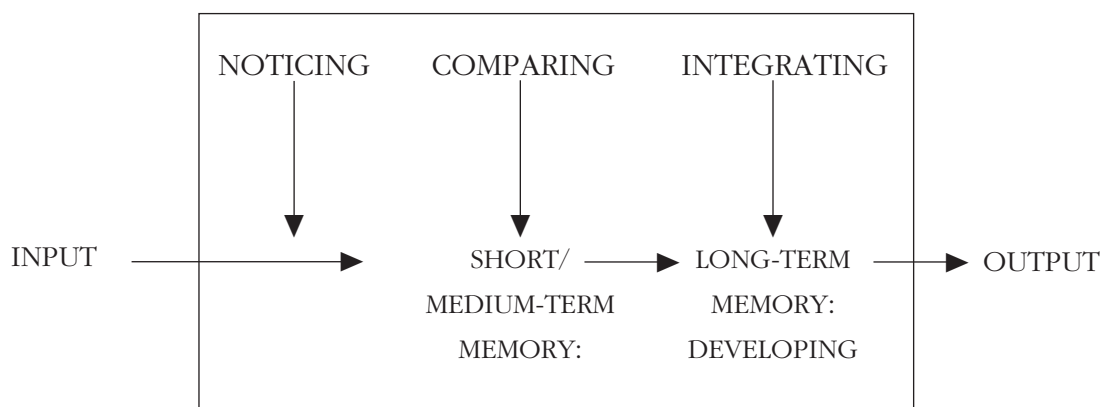

Figure 1: The Process of Learning Implicit Knowledge (Ellis, 1997: 119)

Ellis (1997) also proposes six factors that help promote noticing in the input including (1) task demands which stimulate students to pay attention to specific features that help them achieve the tasks; (2) frequency of the target forms which repeatedly occurs in the input; (3) unusual features of the target forms which are easy for learners to notice; (4) salience of the features can draw the learners' attention to the target forms; (5) interactional modification during the problems and (6) the learners existing linguistic knowledge which help them to notice and make comparison between their current state of interlanguage systems and the target language systems in the input.

Therefore, in using concordances as the materials for data driven learning, and promote students' implicit learning knowledge, teachers should integrate the steps of DDL learning suggested by Chujo and Oghigian (2008) and the process of implicit learning knowledge which was suggested by Ellis (1997). That is, at the noticing stage, students have to notice the concordances from their search in order to induce the rules. Then, at the comparing stage, teachers should provide the task which learners have opportunity to compare the difference of the induced rules and their incorrect rules in their own writing. At the last stage, they have to integrate their obtained knowledge from noticing and comparing process to their interlanguage system which will become the long term memory.

According to Hunston (2002), DDL is beneficial to advanced learners and concordances are the data which can help to promote noticing in learning. Consequently, it is interesting to investigate the effects of low proficiency Thai EFL learners in using concordances to correct their grammatical errors. The present study was carried out to find out the degree to which grammatical structures the low proficiency EFL learners could correct the most and the least accurately, as well as which grammatical rules they could retain the most and the least accurately. Moreover, their stages of implicit knowledge were also explored in this study.

Research Questions

This study, thus, sought to answer the following questions:

1. To what extent are low proficiency Thai EFL learners able to self-correct

grammatical errors and retain required grammatical rules after using concordances?

2. Which grammatical errors are corrected and retained most accurately, and which least accurately?

3. To what extent can the learners' ability to self-correct the grammatical patterns become implicit knowledge? In what way?

Methodology

Participants

For the purpose of convenience, one intact group of 37 Thai EFL students studying in grade 11 at a private high school in southern Thailand was chosen to participate in this study. They had studied English for the past ten years. Their English proficiency was considered as in the low level, as their mean English score from the final test (semester 2, 2008) administered by the school was 59.32%. All of the students had sufficient computer literacy; most of them used the Internet for e-mailing, chatting online, or consulting online dictionaries.

Data Collection Instruments

1. *Three Error-Correction Tasks.* The researcher who was the teacher composed three short narratives (150 words each) and provided each task at a time for 50 minutes to correct 5 types of underlined grammatical errors; nouns, verbs, prepositions, articles, and subject-verb agreement. The first task began in week 14. The participants had to retrieve the concordance lines themselves so as to discover the correct grammatical rules and correct them. Following Ellis (1997), the tasks were designed to draw the participants' attention to repeatedly notice salient features illustrated in the concordance outputs.

2. *Teacher's Observation Notes.* The purpose of teacher's observation was to record how the participants used concordances during the error-correction tasks. The overall observation included detailed notes and observation checklist form used by the teacher. The key observation points were learners' strategies of using concordance lines. The observation commenced in week 14 with the duration of was three weeks during the three error-correction tasks.

3. *The Post-Test for Self-Correction.* The test was administered immediately after the treatment, and took place in week 17. On the post-test, the participants were required to correct their own work, which were written in week 1, individually by using the trained computer concordancing skills within one period of 50 minutes.

4. *Stimulated Recall Semi-Structured Interviews.* The interview was carried out individually with the participants in week 18, one week after the completion of the post test. Each participant was interviewed for approximately 30 minutes. A list of questions was set up as the interview framework and these questions aimed at eliciting students' learning processes in three areas: computer concordancing skills used, observed concordance skills, reflection on learners' prior knowledge.

5. *The Retention-Test.* The purpose of the test was to measure the degree to which the participants could retain the grammatical patterns they had learned from the training period and from doing the three error-correction tasks. Another narrative similar to the three tasks was provided to the participants in week 24. Six weeks was considered appropriate because the researcher wanted to ensure that sufficient time had elapsed since the participants had started practicing. The learners were required to correct the underlined grammatical errors without using concordancer within one period of 50 minutes.

Data Collection Procedure

The study was carried out over 18 weeks. In week 1, the participants were given a picture prompt-writing exercise to compose a narrative for approximately 150 words within 50 minutes. The purpose of this activity was for the researcher to find the five most common types of grammatical errors which were then used to design the concordance exercises and the tests. From weeks 2 to 13 (each week lasted 50 minutes) the researcher trained the participants on how to use the concordancer and practice how to induce grammatical patterns from concordance outputs. The contents of each week were as follows: week 2, the researcher reviewed the parts of speech in English with the students to ensure that the learners had sufficient background knowledge to identify each part of speech. The main focus of the lesson was to illustrate that some words can function as more than

one part of speech.

The researcher understood that this is a problematic area for Thai students. The exercises concerned the identification of the parts of speech given at sentence level. This activity also familiarized the students with how to induce grammatical rules from concordance outputs.

Weeks 3-5, the main focus of the lessons were how to search for single words and groups of words (associated words) and extract the concordance lines. The researcher demonstrated such processes and guided the participants by giving step-by-step instructions. Each period, the participants were given exercises to practice using the concordancer.

Weeks 6-8, the participants were taught to induce the grammatical rules which were the "noticing" stage of implicit learning knowledge. Concordance printouts were used as exercises to practice inducing grammar rules by using parts-of-speech knowledge. The steps of teaching pattern induction included: (1). the explanation on how to induce grammatical rules. This involved noticing how the target words were used in the lines and looking at the words before and after the target word in each line. (2) The participants practiced inducing rules from the given concordance exercises. Then, the participants, together with the researcher, used the concordancer by using the word search from the given exercises to search for varieties of concordance lines. In short, in this lesson, the participants were taught how to solve problems which they might face in the self-correction process.

Weeks 9-13, the participants were trained how to induce grammatical patterns through the "comparing" stage of language acquisition. That is, the researcher showed them concordance printouts, then together with the participants arriving at the induced grammatical patterns. The participants independently looked at the error-correction exercises containing five incorrect grammatical rules which were underlined and compared the incorrect rules with the induced rules. During these five periods, the researcher showed them how to search for the target words and also helped them with any technical problems arising from the use of a computer.

In weeks 14-16, the participants were given three error-correction tasks, each containing five types of grammatical errors. The errors were underlined without any grammar rules or codes. The participants were required to use the underlined word errors to search for the grammatical rules, and induce the patterns by noticing the extracted concordances. They then had to correct the errors using the induced rules from the concordance lines. The researcher observed the learning process and took notes.

In week 17, with the aid of concordance outputs, the participants were asked to self-correct their own work written in week 1, only the five types of grammatical errors underlined. The participants were supposed to apply the three steps learned from the three error-correction tasks.

In week 18, the researcher carried out an in-depth interview with each student. Six weeks after the completion of the experiment, the retention test was administered in order to measure their long-term memory (so called "integrating" stage of implicit learning knowledge) of the grammatical patterns.

Findings

1. Learners' Ability to Self-Correct Grammatical Errors and Retain the Grammatical Knowledge

To answer the first research question as to how effectively low proficiency learners were able to self correct and retain the grammatical rules after using concordances, the researcher analyzed the mean scores and the percentages of the number of grammatical errors that were corrected in the post-test and the retention test. The results of the learners' self correcting ability are presented in Table 1:

Table 1: Number of Grammatical Errors Corrected and Mean Difference between the Post-Test and the Retention Test

Test	No. of Grammatical Errors	Mean ($\overline{X}$)	SD	Mean Difference	T	Sig. (2-tailed)
Post-Test	11.89*	64.34	20.65	10.01	2.021	.05**
Retention Test	10	54.32	18.79			

* The number of errors in the self-corrections of each student was different depending on their writing ability to compose a narrative.

** Significant at 0.05 level.

With respect to the data in Table 1, it was found that, on average, the mean score of the errors corrected in the post-test was 64.34%, whereas 54.32% of all target grammatical patterns were retained six weeks later. According to the data in the table, the difference between the means of errors corrected in the post-test and the retention test was 2.021. When the two sets of scores were compared, it was found that they were significantly different (t = 2.021, p < 0.05). The results indicate that after six weeks of learning by using concordances, the learners could retain only a half of all grammatical rules.

2. Types of Grammatical Errors Which Were Successfully Corrected Most and Least Accurately, and Retention of the Grammar Principles

To report the findings of the types of grammatical patterns which were successfully corrected and retained the most and the least accurately, the numbers of each type of grammatical errors that could be corrected from the post-test and retention test were then compared using paired-sample t-tests to determine the differences between the learners' ability in self-correction and in retention. The results are presented as follows:

Table 2: Types of Grammatical Successfully Corrected Most and Least Accurately and Mean Differences between the Post-Test and the Retention Test

Types of Errors	Post-Test		Retention Test		Mean Difference	t	Sig. (2-Tailed)
	Mean	SD	Mean	SD			
Nouns	83.11	35.38	87.84	21.74	4.73	.721	.48
Articles	84.16	25.03	72.97	32.48	11.19	1.451	.16
Subject-Verb Agreement	78.87	33.51	91.89	27.67	13.02	1.787	.08
Prep	47.07	41.86	29.73	34.28	17.34	1.955	.06
Verb	48.29	40.23	23.42	30.29	24.86	3.054	.00**
Total	64.34	20.65	54.32	18.79	10.01	2.021	.05*

** Significant at 0.01 level.

* Significant at 0.05 level.

As seen in the Table 2, the findings show that the top three types of grammatical errors successfully corrected the most accurately in the post-test and the retention test were the types of subject-verb agreement, articles, and nouns. The articles category was the most successfully corrected grammatical error (84.16%) on the post-test whereas subject-verb agreement was the grammatical error corrected the most, at 91.89%, on the retention test. However, the results from both the post-test and retention test show that prepositions and verbs remained problematic for learners to correct. Learners corrected verb errors with only 48.29% of the time, and prepositions only 47.07% of the time, on the post-test. On the retention test, verbs were the least corrected error, at 23.42%, and prepositions were at 29.73%.

Turning now to the most and the least common grammatical types that the learners could retain, the mean differences for each type of grammar in the post-test and the retention test were compared. The findings show that nouns were the grammatical structure most commonly retained six weeks after the treatment (t = 0.721), whereas verbs were the least commonly retained in this study. The results from the t-test also confirmed that there was a statistically significant difference between the post-test and retention test for verbs (t = 3.054, p < .001).

3. Learners' Ability to Develop Their Implicit Knowledge Through Self-correction

The data from stimulated recall interviews on self-correction each grammatical rule from the post-test and the retention test were transcribed. To establish the presence of noticing stage, comparing stage and integrating stage, the researcher classified the data obtained from the interviews using the following criteria: any participant who reported that they could remember the grammatical rules and successfully correct the errors in the retention test would be assigned to the "integrating" group; participants who were able to use the concordances to correct the errors but could not remember the grammatical pattern were assigned to the "comparing" group, and participants who were able to induce rules correctly but unable to correct the grammatical errors were assigned to the "noticing" group. The results are presented as in Table 3 below.

Table 3: Percentage of Grammatical Errors Corrected based on Stages of Learning Implicit Knowledge

Grammatical Errors	Noticing		Comparing		Integrating	
	No. of SS	%	No. of SS	%	No. of SS	%
Subject-Verb Agreement			3	8%	34	92%
Articles			5	14%	32	86%
Nouns			7	19%	30	81%
Verb	32	86%	4	11%	1	3%
Prep	29	78%	5	14%	3	8%

As Table 3 shows, apparently subject-verb agreement was the grammatical type which the majority of the participants (92%) could develop their implicit learning skills to become part of their long-term memory at the "integrating" stage, followed by articles (86%), and nouns (81%) respectively. By the same token, verbs and prepositions were the grammatical patterns which the majority of the participants, 86% and 78% respectively developed their learning only at the "noticing" stage. The findings seem to suggest that subject-verb agreement, articles, and nouns were the grammatical types which could become implicit knowledge at the level of "integrating" whereas verbs and prepositions were still at

the level of "noticing" only.

To further explore the learners' ability to turn input into implicit knowledge, the researcher sought the answers as for the strategies they employed while using the concordance outputs. The data from the teacher's observation notes and stimulated recall interviews were analyzed to shed lights on this aspect, as shown in Table 4. shows the learners' strategies in dealing with the concordance output.

Table 4: Learners' Strategies in Using Concordances for Self-Correction

Strategies	No. of Respondents	Percentage (%)
1. Using their prior grammatical knowledge	32	86%
2. Asking their peers or teacher for guidance	27	73%
3. Using their intuitions	24	65%
4. Asking their friends for the answers	20	54%

Note: The learners could give more than one answer.

As seen in Table 4, the majority of the participants (86%) used their own background grammatical knowledge to correct the grammatical errors while 73% asked their peers and teacher for the guidance in learning, followed by using their intuitions (65%) and asking their friends 54%. The findings indicated that the majority of the participants could turn 3 grammatical input (nouns, articles, and subject-verb agreement) into their implicit knowledge, whereas the other two (verbs and prepositions) were still problematic for them.

Conclusions and Discussions

In short, concerning the ability of the participants in self-correction, the findings of the post test revealed that sixty-four percent of all the participants' grammatical errors were successfully corrected, and about fifty percent of grammatical errors were successfully corrected without using the concordances on the retention test. That is, the participants retained significantly fewer correct grammatical patterns six weeks after the post-test. This finding was in agreement with the study conducted by Gaskell & Cobb (2004), in which it was

found that the subjects could perform better in the first three weeks of practice periods. While the errors in the last three weeks were complex and difficult to search for the concordances only in one time, the subjects could not use concordances to correct the errors.

Regarding the types of grammatical rules which the participants could correct the most and least successfully, it was found from the study that subject-verb agreement, nouns, and articles were corrected the most successfully, while prepositions and verbs were the least successfully corrected in all the data collection instruments. In addition, nouns were the grammatical structure best retained six weeks after the treatment, whereas verbs were the least well retained.

The findings were confirmed by the data from the stimulated recall interview that the majority of the participants could develop their grammatical learning into implicit knowledge (nouns, articles, and subject-verb agreement) at the "integrating" stage while a large number of them still had difficulties in turning the knowledge of the use of verbs and prepositions from the "noticing" stage into the "integrating" one.

It can be argued in this study that the success of the participants to learn the grammatical structures at the "noticing" stage and finally turn them into their long-term memories were due to several factors as suggested by Ellis (1997). They are task demands, high frequency of the target forms, salience of the features, and the learners' existing linguistic knowledge. Firstly, in this study, the three error-correction tasks required the participants to perform a specific task i.e. correcting only five common grammatical errors which were underlined. As a results, they, as low-proficiency language learners were focused and not bombarded by many errors which beyond their ability to handle. Secondly, concordance outputs, by their very nature, highlighted the salience of the features which can draw the participants to the language forms on which they were working. This salience of the features coupled with the repetition and frequency of the same language forms presented on the same concordance outputs hightened the participants' ability to notice and study the grammatical aspects they had to correct. Finally, with existing linguistic knowledge, the participants had some knowledge they could rely on.

The following examples illustrate clearly how successful learners employed all available resources to learn a correct grammatical rule. They learned and induced the correct usage of subject-verb agreement, articles, and nouns because they possessed sufficient background grammatical knowledge to compare their incorrect versions with the patterns noticed from concordance lines. Consequently, it was easy for them to integrate the language information from the "noticing" and the "comparing" stages to their long-term memories, as reported by two respondents below:

Student 9

"When I saw the obtained concordances from '2+cow', I noticed that there was 's' at the end of the word cow. I realized that I had to add 's' or 'es' for the plural nouns. Hence, I corrected my work by adding 's' at the end of the word 'cow'. On the retention test, I can remember this rule and I could correct this mistake."

Student 15

"From the concordances, it was easy to notice that plural subject + were (plural verb) and I used the rules to correct my work. On the retention test, I looked at "the water" and then recalled from the concordance lines for the tasks that singular subjects are followed by the singular verbs. Then, I changed the verb 'were' to be 'was'."

For those who still could not develop their correct grammatical knowledge, it can be argued in this study that L1 interference and learners' overgeneralization of grammatical rules seemed to be influential factors affecting the learners' error-correction in the error categories of prepositions and verbs. The fact that the participants could not use all available resources to internalize the two grammatical rules can be explained by Kumaravadivelu (1994). He maintains that task demands are not sufficient to draw the participants' attention to repeatedly noticed salient features illustustrated in the language input. Learners' internal and external factors are also necessary for SLA to occur.

He states that language knowledge, learning methods, the complexity of the input, and the learners' motivation were very important in the learning process.

In this present study, verb and preposition errors were the types of errors which were difficult because of L1 (Thai) interference. According to Ubol (1979), the functions and usage of English prepositions are difficult areas for Thai EFL learners of all backgrounds. This finding is also consistent with that of Lush (2002) who found that most of Thai students' preposition errors were from using knowledge of Thai grammar in writing English essays. This seemed to be a valid explanation why prepositions were the least corrected error in this study.

Overgeneralization of grammatical rules is another cause of errors in the subjects' written work. According to Richards (1974), overgeneralization means that the learner creates a deviant structure based on his own experience of other structures in the target language. Most of the learners' errors were probably due to the influence of Thai prepositions and overgeneralization of the patterns.

The following examples illustrate errors which involved L1 interference and overgeneralization of the grammatical type of prepositions.

Examples

Errors	Reconstruction	Problems
On one day, they went to…	One day, they went to….	Overgeneralization of the rule about "on" with days of the week
they go back to home	they go back home…	L1 interference (literal translation from Thai)
we sit under the shade of the tree	we sit in the shade of the tree	L1 interference (literal translation from Thai)
we should sit at that tree	we should sit under that tree	L1 interference (literal translation from Thai)
they sit at under shade	they sit in the shade	L1 interference (literal translation from Thai)

For the category of verb errors, the learners also made an overgeneralization of the structure in English by adding the verb 'to be' before the infinitive verbs. Moreover, some of them resorted to using literal translation from L1 (Thai) to L2 (English), so the errors found in this case were also from mother tongue

interference (Bennui, 2008). The following examples show the verb errors from the learners in this study:

Examples

No.	Errors	Reconstruction	Reasons
1.1	we <u>want tell</u> the mother	We want to tell our mother	L1 interference (purposive Thai serial verb construction)
1.2	they <u>walk up go</u> on the mountain	They climb a mountain	L1 interference (directional of Thai serial verb construction)
2.1	they sad	they are sad	L1 interference (use adjectives for verbs)
2.2	they very angry	they are very angry	L1 interference (use adjectives for verbs)
3.1	they <u>are go</u> to the park	they go to the park	Overgeneralization of verb 'to be'
3.2	they <u>are come</u> back home	they come back home	Overgeneralization of verb 'to be'

Regarding the complexity of concordances lines, it was found that the participants obtained only two or three concordance lines. Moreover, some concordances were too complicated for them to notice any rules from the concordances. This is reported by Student 23:

Student 23

"My big problem was that there were only two or three examples, which were not enough to help me to see the patterns. And the structures of some concordances were very complicated. I had no idea what and where to notice."

Moreover, they had no idea how to compare their incorrect rules with the induced rules because of their limited prior grammatical knowledge. Most of them could not recognize and identify how to use the concordance lines for error-correction. Thus, in this case, the concordances did not help them in the process of learning grammatical rules implicitly, as reported by two respondents:

Student 28

" … *sometimes I had no idea how to correct the errors. I thought that the underlined errors were correct and I do not know how to apply the induced rules to correct the errors."*

Student 35

"It was difficult to think that what was wrong in the underlined phrase. I had no idea so I had to ask my friends to explain me how to correct them."

The third factor is the learning method that the participants were unfamiliar with inductive teaching methods. This seemed to be one reason why the participants struggled when exploring the grammatical rules. The data from the teacher's observation notes revealed that at the beginning of the training period, the participants' capacity to work on concordances was quite low. It could be that they were not familiar with a large amount of information presented in concordance lines. After they were trained to better work with the large outputs, their performance developed gradually. At the end of the experiment, they had to handle the concordance outputs alone in order to correct the errors presented in the three tasks. Most of them lacked confidence in working with the information without the researcher's guidance, as shown below:

Student 9

"Obtaining a lot of examples confused me and it was thus hard to induce the rules by myself. I preferred teacher's explanation in class than using the concordances."

According to Sun (2003), for EFL learners who have learnt English grammar through deductive teaching methods, it is more difficult for them to change to inductive learning methods. Thus, extensive guidance in using inductive learning strategies is recommended for the future. Teachers should give learners both methodological and psychological preparation by training them to learn independently step-by-step in order to prevent them from being overwhelmed by a large amount of information. Moreover, teachers should tell learners the

benefits of learning inductively and stimulate them so that they have the ability to take responsibility to learn independently. In addition, timely training and guidance from teachers is important for learners.

Pedagogical Implications

The results of this study may be helpful in designing the tasks using concordances for the learners at a low level of proficiency to notice the concordance outputs in order to be more able to self-correct their own writing. Teachers should simplify data by controlling the amount of language input and should present concordance lines with simple language structures to learners in the form of printouts. Then, learners should be trained in how to deal with the functions of the concordancer. Importantly, during the training, teachers should give guidance and observe learners closely in order to help them when they face problems. Furthermore, giving learners psychological preparation would be worthwhile. Teachers should tell learners the advantages that they will receive from independent learning and motivate them by telling them that everyone has the ability to take responsibility for their own learning. In a nutshell, data-driven learning through concordances is a form of empowerment.

Recommendations for Further Study

Some issues were not examined in this study due to certain limitations. Thus, some of recommendations for further study are given below.

1. In a future study, think-aloud protocol should be another instrument to use for collecting data in order to get more information.

2. A future case study should have a small number of participants, for example five or six, for better observation results.

3. As the aim of this study was to discover general trends used by learners, the question of which strategies are most useful in dealing with concordances was not covered. Thus, a future study may also investigate this topic.

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