Effectiveness of English Preposition Learning through Data-Driven Learning (DDL)

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ABSTRACT

This study aims to investigate the effectiveness of paper-based data-driven learning (DDL) method in developing young Thai students in learning three English prepositions, which are ‘during’, ‘among’ and ‘between’, and to examine the attitudes of the participants towards learning through the DDL activities. The convenience-sampled participants were 30 Thai grade 4 students who have A2 CEFR level, studying in a private school in Nakhon Sawan province, Thailand. They were taught the target preposition using DDL for 6 weeks. In order to analyse the data, the mean scores of pre-test and post-test were compared by using paired-samples t-test. The tests consist of gap-filling, grammaticality judgement test and sentence building. The results showed that there was a statistically significant difference in their mean scores ($p < 0.001$), which increased from the pre-test to the post-test after DDL activities were introduced to the students. According to the test results, it was found that the participants could develop their grammatical consciousness and produce more meaningful and grammatical sentences with a variety of complexity. Moreover, the questionnaire and interview responses revealed the positive attitudes of the participants towards learning through the DDL method as they found it fun, interesting and challenging, and they considered this method as a helpful resource for learning new grammatical knowledge. Thus, this study yields an instructive result that DDL can be applied with young EFL learners and could be an encouraging teaching method for EFL/ESL teachers.

Keywords: data-driven learning (DDL); English preposition teaching; young Thai EFL students; Corpus linguistics; paper-based

INTRODUCTION

Grammar is considered as one of the most difficult skills of English for Thai students because of the differences of Thai and English grammar (Anyan 2006). Anyan explained that Thai grammatical structure is more straightforward than English’s. Therefore, many Thai students are usually not aware of proper English grammar when they use the language and tend to produce ungrammatical sentences.

Although grammar is introduced to Thai students at an early age, most of them still cannot apply their learnt grammar to real life communication (Chingchit 2008, Choomthong 2014). It is possibly more beneficial for students if teachers pay more attention to the teaching procedures when teaching grammar to the students by changing the teaching methods, for example, focusing more on inductive language teaching rather than only using the Grammar Translation Method (GTM), which is the most popular method among Thai English teachers. Most Thai teachers who do not master English seem to be more comfortable with the GTM because they are allowed to use L1 in the classroom and translate the content in textbooks from English to Thai, which can lead to the failure of English language education since students appear not to be able to communicate in English (Thonginkam 2003). Chingchit (2008) also points out that Thai teachers are forced to use the grammar translation approach to teach their students so that students will get good scores on
the standardised examination because of the current English curriculum of Thailand that heavily emphasises grammar rules rather than communicative language skills.

One of the inductive approaches in grammar learning by using corpus information is “data-driven learning” (DDL), introduced by Johns (1986). Learners have to investigate the language through the concordance lines because these can reveal real examples of language from native speakers. Learners have to identify, analyse and generalise the language patterns from the given data. The role of teachers is more like a helper who guides students while they are looking for patterns. This approach can be called the “student-initiated language research” which can enhance learner autonomy.

There have been some studies on using DDL in grammar teaching. For example, Bolton (2010) found that paper-based DDL significantly increased the post-test scores of second-year non-native students who had low English proficiency level. Huang (2014) also investigated the effectiveness of DDL approach with third-year Chinese students. He found that DDL can better students’ production in writing. However, there are few studies on using DDL with young learners, therefore, this present study aims to investigate the effectiveness of paper-based data-driven learning (DDL) method in developing young Thai students in learning English prepositions, which are during, among and between, and to examine the attitudes of the participants towards learning through the DDL activities.

THAI LEARNERS’ PROBLEMS OF ENGLISH PREPOSITIONS

Prepositions are one of the most challenging and difficult English grammar points for English as a Foreign Language (EFL) teachers to teach L2 learners (Delija & Koruti 2013). In terms of preposition learning, EFL learners usually have problems of choosing prepositions, omitting a required preposition and using unnecessary prepositions (Inezan & Najim 2010). There are several reasons why learning English prepositions is difficult for non-native speakers. Brown (1987) has explained the major causes of a misuse of prepositions made by L2 learners, which are interlingual transfer that occurs when learners tend to translate the target preposition in their first language, and intralingual transfer that occurs when learners overgeneralise the rules (as cited in Delija & Koruti 2013). Thai learners also encounter similar difficulties in learning English prepositions (Promma 2014 Chiwpreecha 2012 as cited in Promma 2014) It was found that interlingual transfer was the important cause of Thai learners’ mistakes on using prepositions, for example, the misuse of in and on as prepositions of place (Chiwpreecha 2012).

CORPUS LINGUISTICS

O’Keeffe, McCarthy and Carter (2007) have defined a corpus as “a collection of texts, written or spoken, which is stored on a computer” (p. 1). According to Lindquist (2009), corpus linguistics is defined as a methodology to analyse the rules of language and language changes that occur through time when people of different languages interact. The linguist may handle a corpus data by analysing either concordance lines or frequency lists (Evison 2010, Lindquist 2009). “A concordance is a list of all the contexts in which a word occurs in a particular text” (Lindquist 2009, p. 5). In order to identify aspects of a particular word or phrase, such as lexico-grammatical patterns or semantic prosody, a linguist usually extracts the data from the ‘Key-Word-In-Context’ (KWIC) concordances, in which all the occurrences of the search item or ‘node’ (O’Keeffe, McCarthy & Carter 2007) will be displayed vertically in the centre of the line. Meaning and collocations can be analysed through concordance lines by looking at the context and items around a node word (Evison
2010). The surrounding words can enhance learners’ awareness of lexico-grammatical knowledge.

DATA-DRIVEN LEARNING AND LANGUAGE TEACHING

Römer (2008) suggests how teachers can apply corpora to designing corpus-based teaching materials and teaching syllabi. English teachers usually follow the language patterns presented in the textbook and assume that a textbook provides the most frequent and useful patterns for learners. Most textbook writers did not consult a corpus when they wrote the textbooks but tend to rely on their own intuition and what other textbooks do in general (Jones & Waller 2015). Furthermore, most English textbooks are designed to teach grammar explicitly and deductively, which provide learners with various exercises, such as memorising dialogues, reading simplified texts, and doing transformation exercises (Cowan 2008). Long (1997) argues that explicit teaching like “focus on forms” can make learners feel overwhelmed with too many grammatical forms that rarely meet their needs, and does not provide real-life language use to learners (cited in Cowan 2008). For example, in terms of preposition teaching, Delija and Koruti (2013) claim that many English coursebooks only provide learners with a general overview of prepositions without providing additional rules for some particular contexts, and lack the information about co-occurring verbs and nouns of each preposition.

As mentioned by Römer (2008), we can also apply corpora to teaching directly by combining a teaching approach called data-driven learning (DDL) into the English language teaching. Data-driven language learning (DDL) was initially introduced by Tim Johns in the 1980s. DDL approach is an inductive learning strategy designed to provide learners with direct access to the authentic data so that they can formulate their own language patterns and rules (Johns, 1991). However, DDL is different from other inductive approaches in terms of learning procedure in which data will lead learners to the discovery of language patterns in which teachers are not aware of the results at the beginning (Johns, 1991). Teachers can choose either presenting the prepared concordance lines to learners or directly providing them with corpus access to search for data by themselves (Chambers 2010). Therefore, learners can perform as both language learners and language researchers at the same time (Cheng 2010).

One of most significant Second Language Acquisition (SLA) theories that is linked with DDL is Computer Assisted Language Learning (CALL), where the computer is used as a tool for investigating language to promote learner autonomy (Sripicharn 2002). Corpus-driven data is probably related to comprehensible input of Krashen (1988), one of the theories of SLA, if the data were simplified to suit learners’ proficiency (cited in Sripicharn 2002). Schmidt’s (1990) Noticing Hypothesis also plays an important role in DDL approach when learners are able to notice the grammatical pattern, transforming input to intake. In terms of grammar teaching, noticing hypothesis can be called Grammatical Consciousness-Raising (GCR). In DDL approach, KWIC concordances perform as GCR in order to raise learners’ attention to the target items because KWIC concordances can make learners identify the repeated co-occurring patterns easily (Sripicharn 2002).

Moreover, a corpus offers a useful resource for learners to develop their own learning process to acquire both implicit knowledge, learning without awareness, and explicit knowledge, learning with awareness (Cheng 2010). Johns (1997) proposed the idea that “every student a Sherlock Holmes”, which means the role of students in the DDL approach is more like a researcher or a detective who discovers and solves language problems by themselves. Thus, this approach keeps learners participating actively in the learning process and creates learner autonomy (as cited in Gilquin & Granger 2010) A corpus-based
grammar also adopts the ideas of task-based and communicative activities by allowing learners to work in group or do a project. Learners will have the opportunity to investigate through particular language patterns by themselves and develop their grammar analysis skills (Hughes 2010, Zohairy 2012). DDL approach, hence, introduces a new style of “grammatical consciousness raising” (Rutherford 1987, as cited in Johns, 1991) to grammar learning by encouraging learners to rely on their own ability in exploring the authentic language and obtaining the general results by themselves.

ADVANTAGES OF DDL IN GRAMMAR TEACHING

There are many researchers investigating the effectiveness of DDL in teaching English grammar. Yepes and Krishnamurthy (2010) examined the effectiveness of both corpus-based and corpus-driven approaches by using the Aston Corpus Network (ACORN) to teach Spanish grammar to two groups of participants who had different proficiency levels. The beginning learners (GC1) were taught by a corpus-based approach, whereas the advanced learners (GC2) were taught by a corpus-driven approach. The researchers found that learners had positive attitudes towards teaching grammar through corpus since they found that this approach was useful for them in the execution of future tasks. Nugraha, Miftakh and Wachyudi (2017) employed the British National Corpus (BNC) in teaching grammar (i.e., subject-verb agreement, adjective and adverb) to the students. They point out that most of the students had positive attitudes towards the DDL approach in which they felt it was effective and different from traditional English lessons. The results of many studies also showed the effectiveness of using DDL in improving students’ writing ability. Yunus and Awab (2012) carried out a study aimed to investigate the effects of using paper-based corpus materials and an online DDL approach on promoting the knowledge of forms and meanings of collocations of prepositions of 40 law undergraduates in Malaysia. The findings showed that the DDL group’s posttest scores in the sentence completion task, error-identification and correction task, and semantic function task were significantly higher than the CA (Conventional Approach) group’s. The researchers suggested that further investigation should be conducted with less advanced learners and using paper-based DDL materials since there seem to be very few studies dealing with these matters. Huang (2014) also found that paper-based DDL activities were helpful for students for acquiring collocations and grammatical patterns, and memorising the usage of target words in the long term since the participants’ produced sentences in the posttest contained fewer errors and more variety of NP patterns, adjectives, premodifiers, and grammatical structures.

Moreover, the study of Lin and Lee (2015) reflected positive attitudes towards using DDL for teaching grammar. In particular, DDL can transform the behaviour of students to be active learners, whereas students appeared to be passive learners in a grammar translation method (GTM) classroom. DDL is not only a useful method for grammar teaching, but also for vocabulary teaching since the learners found it raised their awareness towards lexical items as their depth of vocabulary increased, especially in learning synonyms and collocations (Aşık, Vural & Akpinar 2016). Moreover, DDL can create the student-centred atmosphere where they actively participated in the activities; on the other hand, the centre of the GTM class was a teacher rather than students. Some teachers said that DDL can improve the students’ long term retention as well because it motivates students to learn better and enhances their interest in learning. Boulton (2010) also found that the participants viewed DDL as the most useful method for the contexts and concrete examples that highlight usage and grammar. This positive result of this study suggested that paper-based materials, prepared in advance by teachers, are tangible and suitable for low-proficiency students to manage and consult at the later day.
APPLYING DDL IN THE EFL CLASSROOM

Before applying DDL into the classroom, teachers may consider the proficiency of learners as the first priority and then design whether the activities would be “teacher-led end”, in which tasks in the class are controlled and prepared by teachers in advance, for example, cloze tests and fill-in exercises, or “learner-led end”, in which learners have more freedom in discovering the language during the learning process (Gilquin & Granger 2010). Hunston (2002) viewed that beginning learners should learn through teacher-led activities, whereas discovery learning or learner-led learning is more suitable for advanced learners.

The role of teachers is that of a facilitator of the learning process by preparing learners to manipulate a corpus and draw a conclusion from a corpus data as most effectively as possible (Chambers 2010). The teachers should be able to motivate the students to get through concordance lines given by using signposting and guiding questions to raise students’ awareness (Flowerdew 2012). For beginning learners, teachers should use scaffolding techniques to help learners deal with large quantities of corpus data by selecting short and salient concordance lines, making the data easy to be noticed, circling or underlining context clues for them (Sripicharn 2010). Kirschner, Sweller and Clark (2006) suggested that paper-based materials for DDL serve as a more appropriate tool to encourage beginning learners who have less experiences and background knowledge to discover language patterns, rather than immediate hand-on concordancing. According to Boulton’s (2010) study, DDL paper-based materials can help lower level learners to deal with grammatical items if the materials are prepared appropriately although teachers are not the expert in corpus linguistics.

However, learners should be aware of some of the limitations of a corpus data in that it may not represent all aspects of language patterns, so they could overgeneralise the rules if not sufficient amount of data is provided in their language learning. Sripicharn (2010) also recommended learners to use hedging words or phrases, such as seem to, is likely to, is typically or commonly to, to avoid making a strong conclusion when they interpret data.

LIMITATIONS OF DATA-DRIVEN LEARNING (DDL)

Flowerdew (2012) claims that DDL might be more effective with ‘field dependent’ students who prefer interaction in the classroom rather than instruction. Also, the authentic language provided in a corpus would be too difficult for low proficient learners to interpret the data, whereas those who have higher proficiency levels would find this approach challenging. The ‘cultural distance’ of non-native students who have never been to English-speaking countries or met native speakers before is another factor that makes DDL impossible in ELT classroom since learners are not familiar with authentic data (Hughes, 2010).

Based on the problem and the related literature explained above, this study attempts to answer two research questions:

1. Are there any significant differences in the scores of pre-test and post-test after DDL is introduced in English preposition teaching?
2. What are Thai EFL students’ attitudes towards DDL approach?

It was hypothesised that young Thai EFL learners will gain significantly higher post-test scores than post-test scores after studying English prepositions through DDL and will have positive attitudes towards DDL approach in learning English prepositions.
METHODOLOGY

PARTICIPANTS

The researcher used convenience sampling to recruit the participants from Grade 4 EFL students in an Intensive English Programme (IEP) at a private school in Thailand because the researcher was teaching English in this school. Due to the fact that the participants were non-native elementary students, the researcher conducted this study with the highest performance section as students at low-proficiency levels might encounter some difficulties in interpreting corpus data (Flowerdew 2012). In the class, there were 50 students whose L1 language background was Thai. They had been studying English as a second language for almost 4 years, and had a mean age of 10.

In order to ensure that all the participants had the same level of English proficiency, the adapted paper-based Cambridge English Placement Test for Young Learners was distributed to them. The scores of the placement test for the young learners correspond to the Pre-A1 to B1 levels of the Common European Framework of Reference for Languages (CEFR). However, the researcher was aware of the possibility and the ability to generalise the results of this study to the majority of Thai students; therefore, only participants who were rated as A2 level learners were included in the study. According to the CEFR levels, the A2 students are able to deal with simple, straightforward information and begin to express themselves in familiar contexts. As a result, it could be the standard level for young learners to begin learning through DDL. According to the test results, there were 30 participants out of 50 participants rated as A2 level and had a mean score of 37. Before conducting the research, the consent forms were given to the parents of the participants in order to give the permission for their children to participate in the research study, and the researcher was allowed to conduct this study with them.

DATA COLLECTION AND INSTRUMENT

This study is a one-group pre-test post-test design. Prior to the instructional period, the participants were asked to do a pre-test related to prepositions of place and time in English. The participants were taught once a week in an extra activity class, which did not affect their regular learning, for 50 minutes. The study was conducted over a six-week period. Immediately following the six weeks of instruction, the participants completed a post-test with the same test tasks as the pre-test, which consisted of 15 items of gap-filling, 15 items of grammaticality judgement test (GJT), and 5 items of sentence building, as described in Table 1. The total score was 40. The scores of the two tests were evaluated by the researcher.

<table>
<thead>
<tr>
<th>Task description</th>
<th>Task measurement</th>
<th>Numbers of items</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Gap-filling</em>: Participants choose the correct</td>
<td>Knowledge of meaning</td>
<td>15</td>
</tr>
<tr>
<td>prepositions to fill in the given space.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>GJT</em>: Participants judge the given sentences</td>
<td>Knowledge of meaning and use Grammatical</td>
<td>15</td>
</tr>
<tr>
<td>as to whether each sentence is grammatically</td>
<td>awareness</td>
<td></td>
</tr>
<tr>
<td>correct or not, and provide the correct</td>
<td></td>
<td></td>
</tr>
<tr>
<td>answer if it is incorrect.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Sentence building</em>: Participants describe</td>
<td>Knowledge of meaning and form Knowledge</td>
<td>5</td>
</tr>
<tr>
<td>the pictures by using the learnt prepositions.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Knowledge of use</td>
<td></td>
</tr>
</tbody>
</table>

Lastly, the Thai version of attitudes questionnaire, which was adapted from Phoocharoensil (2012), was distributed to all participants to investigate their attitudes towards studying through DDL approach. The questionnaire consisted of 12 statements
of a 5-point Likert scale, from 1=strongly disagree to 5=strongly agree, one open-ended question about their problems in learning and 3 items of closed questions. In order to triangulate the data, only 10 participants who had the outstanding development after learning English prepositions through DDL, for example, those who had very high post-test scores, but low pre-test scores, were interviewed in their L1 Thai language for exact information.

DATA ANALYSIS

In order to analyse the data, the mean scores of pre-test and post-test were compared by using paired-samples t-test to examine the effectiveness of using DDL in teaching prepositions. In terms of participants’ attitudes towards the DDL method, the results from the 5-point Likert scales, were analysed by comparing the frequency.

INSTRUCTIONAL TREATMENT

Due to the fact that prepositions are considered as difficult and problematic matters for learners at every level of proficiency (Cowan 2008), the researcher selected the problematic prepositions found in the placement test, which were *during*, *among* and *between*, because the participants probably had never studied these prepositions before. Also, these prepositions have similar meanings in Thai, which can cause confusion to Thai EFL learners. Hence, providing learners with these prepositions in different environments through concordance lines can shed some light on different usages of such prepositions.

Paper-based DDL teaching materials were developed using language samples from Graded Readers Corpus in both written and spoken languages available in The Compleat Lexical Tutor (http://www.lex tutor.ca), developed by Tom Cobb (2015). In order to make DDL materials manageable for beginning EFL learners, only concordance lines that were appropriate for participants’ level to interpret were selected by the researcher who has been teaching them for four years. The selected concordance lines contained only words and sentence structures that the participants should be familiar with because if the concordance lines consist of too many unfamiliar words and complex grammatical structures, the participants might encounter difficulties in analysing the given data, and this could result in wrong generalisation (Braun 2007).

The DDL tasks in the class were “teacher-led end” which were controlled and prepared by the researcher in advance (Gilquin & Granger 2010) due to the English proficiency and culture of the learners. Furthermore, they need a teacher to guide them through the tasks since this approach was new for them and to prevent the participants’ overgeneralisation. (Sripicharn 2010); therefore, the researcher was there in the class explaining the task, directions and questions provided in the paper-based DDL materials. The concordance lines were printed and presented to them in the KWIC format to make the data easier for learners to analyse the target language patterns (Appendix 1). The participants worked in small groups, analysed the data and reported what they found in the samples through the provided worksheet. They were then asked to share their findings to the class and complete the writing task, where they would apply their generalised rules.
RESULTS

THE EFFECTIVENESS OF DDL IN ENGLISH PREPOSITION LEARNING

It was found that the mean scores of the participants increased from 13.50 (SD = 2.59) in the pretest to 26.28 (SD = 6.55) in the posttest, on average, by approximately 13 points.

<table>
<thead>
<tr>
<th>TABLE 2. Paired sample T-Test of overall mean scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Differences</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Posttest - Pretest</td>
</tr>
</tbody>
</table>

There is strong evidence that students’ grammatical knowledge has been enhanced, which suggests that this DDL method seems to significantly improve overall scores of the participants. As shown in Table 2, the p value, which was <.001 was less than .05, so this implied there was a statistically significant difference in their mean scores, which dramatically increased from the pre-test to the post-test after using DDL activities at a significant level of 0.5. As a result, there was only a small probability of this result occurring by chance.

GAP-FILLING TASK

<table>
<thead>
<tr>
<th>TABLE 3. Paired sample T-Test of gap-filling task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Differences</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Posttest - Pretest</td>
</tr>
</tbody>
</table>

The first task of the test was gap-filling which was used to measure their knowledge of among, during and between. According to Table 3, there was a statistically significant increase (p<0.001) in their mean scores from the pretest, 4.60, to the posttest, 8.87, on average, by approximately 4 points. Hence, the results show that the participants apparently had an improvement in learning the English prepositions which were among, during and between.

GRAMMATICALITY JUDGEMENT TASK

<table>
<thead>
<tr>
<th>TABLE 4. Paired sample T-Test of GJT task</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paired Differences</td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>-------</td>
</tr>
<tr>
<td>Posttest - Pretest</td>
</tr>
</tbody>
</table>

Additionally, the mean scores on the second task, grammaticality judgement task, were analysed individually to evaluate the participants’ knowledge of grammar and their ability to judge the grammaticality of the sentences. In this case, the p value was <.001, as shown in Table 4, which indicated that there was a statistically significant difference in the
mean scores of the GJT which increased from 6.77 (SD = 1.70) in the pretest to 10.18 (SD = 2.57) in the posttest, on average, by approximately 3 points. The higher mean scores which appeared in this task revealed that the majority of the participants developed their grammatical consciousness-raising because they were able to identify the incorrect uses of the underlined prepositions and supply the correct answers.

**SENTENCE BUILDING TASK**

**TABLE 5.** Paired sample T-Test of sentence building task

<table>
<thead>
<tr>
<th>Mean</th>
<th>Std. Deviation</th>
<th>Std. Error of the Difference</th>
<th>95% Confidence Interval</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Posttest - Pretest</td>
<td>5.20</td>
<td>2.25</td>
<td>.41</td>
<td>4.36</td>
<td>6.04</td>
<td>12.659</td>
</tr>
</tbody>
</table>

The results of the sentence building task interestingly indicated that most of the participants gained their knowledge of the target prepositions and applied them to the appropriate context where they could describe the provided pictures by using the target prepositions correctly. As shown in Table 5, the p value which was <.001, so this revealed that there was a statistically significant difference in their mean scores which increased from 2.20 (SD = 1.48) in the pretest to 7.40 (SD = 2.32) in the posttest, on average, by approximately 5 points.

In addition, among the three test tasks, it was found that this part presented the most outstanding outcomes of the participants because the students’ ability to describe the pictures by using the correct prepositions was better, as all of them earned higher scores.

Moreover, the researcher compared the complexity of the sentences that the participants produced from the pretest and the posttest. It was found that some of them produced more complicated and natural sentences which could be found in the concordance lines provided in the DDL activities. As Table 6 shows, there are some examples of the participants’ sentences in the third task, which were selected from the participants who had the outstanding development in applying the prepositions in the real context.

**TABLE 6.** Examples of sentences produced by the participants in the tests

<table>
<thead>
<tr>
<th>Participants</th>
<th>Item No.</th>
<th>Pretest</th>
<th>Posttest</th>
</tr>
</thead>
<tbody>
<tr>
<td>S2</td>
<td>1</td>
<td>The house is <em>between</em> the four trees.</td>
<td>The home is <em>among</em> the trees.</td>
</tr>
<tr>
<td>S3</td>
<td>2</td>
<td><em>During</em> the boy is sleep on the bed.</td>
<td>The brother is sleeping on the bed <em>during</em> the night.</td>
</tr>
<tr>
<td>S4</td>
<td>4</td>
<td>He is <em>among</em> the sea.</td>
<td>The boys and girls go to the beach <em>during</em> the morning.</td>
</tr>
<tr>
<td>S5</td>
<td>2</td>
<td>He is sleep <em>among</em> the bed.</td>
<td>The man is sleeping <em>during</em> the night.</td>
</tr>
<tr>
<td>S7</td>
<td>1</td>
<td>The trees are <em>among</em> the house.</td>
<td>The house is <em>among</em> the trees.</td>
</tr>
<tr>
<td>S10</td>
<td>4</td>
<td>The family <em>between</em> the family.</td>
<td>My family is go to the beach <em>between</em> 9.00 and 10.00.</td>
</tr>
<tr>
<td>S12</td>
<td>5</td>
<td>The girl <em>between</em> the flower.</td>
<td>Pam is <em>between</em> the flowers.</td>
</tr>
<tr>
<td>S20</td>
<td>2</td>
<td>He sleep <em>among</em> bed.</td>
<td>I sleeping <em>between</em> 9.00 pm - 10.00 pm.</td>
</tr>
<tr>
<td>S21</td>
<td>2</td>
<td>My father <em>during</em> on the bed.</td>
<td>My brother is sleep <em>during</em> the night.</td>
</tr>
<tr>
<td>S25</td>
<td>5</td>
<td>A princess <em>between</em> a flower.</td>
<td>The princess standing <em>between</em> the flowers.</td>
</tr>
<tr>
<td>S26</td>
<td>4</td>
<td>The boy is among the girl.</td>
<td>Family is walking to the beach <em>during</em> the day.</td>
</tr>
</tbody>
</table>

As Table 6 shows, the sentences produced by the participants in the posttest were more grammatical and meaningful, which were clearly different from the sentences in the pretest. For example, S12 and S25 used *between* followed by plural nouns, the flowers, instead of a singular noun which was ungrammatical in the pretest. In addition, most of the participants can show their progress in learning English prepositions by using them to describe the given pictures properly (e.g. S2, S4, S7, and S20). Moreover, some students
(e.g. S3, S5, S21 and S26) can produce more complicated sentences and reflect their grammatical knowledge about prepositions learnt in the class. Hence, it suggested that, at least, the participants knew the functions and meanings of the learnt prepositions which were *among*, *during* and *between*, and that was reflected through the produced sentences in the posttest.

**STUDENTS’ ATTITUDES TOWARDS DDL METHOD**

**THE SATISFACTION OF STUDENTS IN LEARNING THROUGH DDL**

**TABLE 7. Students’ attitudes towards DDL method (n=30)**

<table>
<thead>
<tr>
<th>Category</th>
<th>Statements</th>
<th>Responses</th>
<th>SA</th>
<th>A</th>
<th>N</th>
<th>D</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfaction</td>
<td>1) I find learning though DDL is fun and not boring.</td>
<td>46.7%</td>
<td>30.0%</td>
<td>23.3%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2) I think that DDL method is more challenging than other traditional methods.</td>
<td>50.0%</td>
<td>36.7%</td>
<td>6.7%</td>
<td>6.7%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3) Learning though DDL is difficult for me.</td>
<td>6.7%</td>
<td>10.0%</td>
<td>36.7%</td>
<td>23.3%</td>
<td>23.3%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>6) I like to discover the language pattern by myself.</td>
<td>26.7%</td>
<td>43.3%</td>
<td>23.3%</td>
<td>6.7%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12) I want to study other English lessons through DDL method in the future.</td>
<td>56.7%</td>
<td>20.0%</td>
<td>20.0%</td>
<td>0%</td>
<td>3.3%</td>
<td></td>
</tr>
<tr>
<td>Content</td>
<td>4) Learning through DDL makes me understand the lesson better.</td>
<td>50.0%</td>
<td>46.7%</td>
<td>3.3%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>5) When I learn grammar, I prefer teacher-centred method to learner-centred method like DDL.</td>
<td>23.3%</td>
<td>26.7%</td>
<td>23.3%</td>
<td>10.0%</td>
<td>16.7%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7) I can retain what I’ve learnt in the long term after studying through DDL method.</td>
<td>30.0%</td>
<td>40.0%</td>
<td>23.3%</td>
<td>6.7%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8) I was encouraged to actively think, express my idea and speak English during DDL activities.</td>
<td>36.7%</td>
<td>40.0%</td>
<td>20.0%</td>
<td>3.3%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>9) I completely understand how to use <em>during</em>, <em>among</em> and <em>between</em> by learning through DDL method.</td>
<td>53.3%</td>
<td>26.7%</td>
<td>20.0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>10) I think that I obtain more vocabulary knowledge and new sentence structures from studying the concordance lines.</td>
<td>33.3%</td>
<td>46.7%</td>
<td>20.0%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>11) In the DDL class, I think that I understood the lesson better when the teacher used scaffolding techniques.</td>
<td>83.3%</td>
<td>10.0%</td>
<td>6.7%</td>
<td>0%</td>
<td>0%</td>
<td></td>
</tr>
</tbody>
</table>

SA= Strongly agree, A= Agree, N= Neither agree or disagree, D= Disagree, SD= Strongly disagree

In terms of students’ satisfaction, as shown in Table 7, the majority of the students (46.7%) evaluated the DDL activities as fun, interesting and challenging. Moreover, almost half of the participants thought that DDL activities were not difficult for them to learn, while some students (16.7%) found the activities difficult. Apparently, the participants in general (70%) enjoyed discovering the language patterns and grammar rules by themselves. It was interestingly found that the majority of the students (56.7%) wanted to learn other English lessons through a DDL method in the future.

Moreover, the results, according to Table 7, revealed that most of the participants evidently had a positive attitude towards the DDL method as it is considered to be a useful resource to learn English grammar, which was consistent with the interview results, as they found studying through reading the concordance lines helped improve their English skills, including reading, writing, and speaking skills, as one of them stated that “concordance lines are useful because they provided me with natural language patterns which can enhance my speaking skill”. In particular, almost all of the participants (96.7%) thought that their grammatical knowledge was enhanced by learning through the DDL method as it helped them understand the lesson and be able to apply *among*, *during* and *between* in the real context, especially when the teacher used scaffolding techniques to guide them throughout the activities (83.3%). One of the interviewee said that “the teacher usually helped guide us when we struggled with the unfamiliar words found in the concordance lines.
to help us understand the lesson better”. Most of the participants also stated that they can retain what they have learnt in the long term. Another benefit of learning grammar inductively through DDL activities is that the majority of the students (70%) acquired more vocabulary knowledge and new sentence structures from investigating through the provided concordance lines. From the survey results, it was evident that the DDL activity has shaped most of the students (76.7%) to be an active learner as they were encouraged to actively think, express their ideas and speak English throughout the class, as one of the interviewee said that “I became more active in the class because I can participate in the activities when I study through DDL activities”. However, half of the participants still preferred prefer teacher-centred method (i.e. traditional method) to learner-centred method like DDL.

STUDENTS’ DIFFICULTIES IN LEARNING THROUGH DDL

The second part of the survey, which involves open-ended questions, revealed that the majority of the participants (24 students) did not encounter any difficulties in learning through the DDL method. By contrast, six students stated their problems in learning through DDL. The main problem occurring during the DDL activities was probably due to the difficulty in interpreting the provided corpus data when the participants who have limited English exposure and proficiency encountered some unfamiliar words. Consequently, a couple of the participants were still confused over the uses of these prepositions and were not confident to use them properly.

REASONS WHY THE PARTICIPANTS LIKED DDL METHOD

![Bar chart showing reasons participants liked DDL method](image)

FIGURE 1. The different reasons indicating why the participants liked DDL method (n=28)

Almost all of the participants, i.e. 28 students, enjoyed learning the English prepositions through studying the paper-based concordance lines in the DDL activities. On the other hand, only two students did not like this kind of teaching method because they thought that the DDL method was more difficult than the previous methods they had experienced.

As shown in Figure 1, the most important reason is that the participants (n=9) considered the provided concordance lines as a helpful resource to discover new vocabulary and structures. The second important reason is that they found the DDL method was challenging for them (n=8). Five participants thought that this method helped enhance their understanding in learning grammar, and four students viewed it as a fun and interesting activity. Lastly, there are two students who liked this method because it is different from other teaching methods.
DISCUSSION AND CONCLUSION

RESEARCH QUESTION I: ARE THERE ANY SIGNIFICANT DIFFERENCES IN THE SCORES OF PRE-TEST AND POST-TEST AFTER DDL IS INTRODUCED IN ENGLISH PREPOSITION TEACHING?

According to the results, there was a statistically significant difference in their mean scores (p <0.001), which increased from the pre-test to the post-test after DDL activities were introduced to the students. Therefore, the first hypothesis, i.e. young Thai EFL learners will gain significantly higher post-test scores than post-test scores after studying English prepositions through DDL, is supported. This study has shown that paper-based DDL plays a crucial role as a useful tool in enhancing the students’ grammatical knowledge, which is broadly consistent with other previous studies (Boulton 2010, Huang 2014, Kirschner Sweller & Clark 2006, Smart 2014, Yunus & Awab 2012). Interestingly, this study suggested that it is possible for young learners to investigate data through a corpus if it is prepared by teachers in advance by simplifying and selecting the appropriate concordance lines to suit the learners’ proficiency. In particular, the mean scores of the posttest are higher than those of the pretest in every part, especially the sentence building task as the difference in mean scores between the pretest and the posttest was the highest when compared to other tasks. The results of the third task concur with other studies that reveal the development of the students in producing more meaningful and grammatical sentences with a variety of complexities because they were exposed to the examples of language patterns through analysing the concordance lines provided in the paper-based DDL materials (Chingchit 2008, Huang 2014, Jones & Waller 2015, Leech 1986). Thus, it could be inferred that the corpus data from concordance lines probably performed as comprehensible inputs that provide good ready-made samples for the participants to imitate in their writing. Moreover, the improved production in writing of the participants.

Furthermore, the higher mean score in the posttest of the second task, which is the grammaticality judgement task (GJT), yields an interesting result that even though the participants are beginning learners, they were apparently able to judge the grammaticality of the sentences, which is inconsistent with the reports of Rahimy and Moradkhani (2012) and Ellis (1991) that this task could be ambiguous and not suitable for beginning learners. Hence, learning through DDL activities helps develop their grammatical consciousness-raising since they were encouraged to rely on their ability in noticing and identifying the target grammatical patterns, which are the prepositions, in the concordance lines (Rutherford 1987, Schmidt 1990, Sripicharn 2002, Tan & Nor Izzati 2015, Yunus & Awab 2012, Aşık, Vural & Akpınar 2016). Moreover, the KWIC concordance lines were used in the paper-based DDL materials, and the node word or the target language item was presented in the centre of the page, in order to raise learners’ attention to the target item and help them identify the co-occurring patterns surrounded the target preposition more easily (Sripicharn 2002). Due to the learning process of DDL, the participants probably developed their grammatical awareness in detecting the ungrammatical items and providing with the correct answers (Cheng 2010). Thus, the results of the GJT task show that after studying through DDL, the students could develop both receptive knowledge and productive knowledge, and suggest that GJT task could be an ideal measurement in order to evaluate the students’ grammatical knowledge studied through DDL.

In addition, the teacher is another key factor that helps trigger the success of DDL as the teacher should perform as a facilitator (Chambers 2010). Teachers’ preparation in designing the paper-based DDL materials and selecting the appropriate concordance lines to suit the students’ proficiency level is evidently the most essential process, especially in this case when the students are young non-native students whose English proficiency level is
low or intermediate. This teacher preparation makes the lessons manageable for the students to analyse the concordance lines effectively and draw a proper conclusion from a corpus data (Boulton 2010, Chambers 2010, Gilquin & Granger 2010, Hunston 2002, Sripicharn 2010). Moreover, the guiding questions provided in the paper-based DDL materials could lead the learners to draw a conclusion from the data more easily because the guiding questions help narrow the scope in searching for the language patterns and provide focus and coherence during the learning the process (Flowerdew 2012). In order to check the students’ understanding of the lessons, the appropriate numbers of exercises should also be provided.

Apart from designing the material, the classroom strategies for teaching and encouraging students to analyse corpus data, such as scaffolding techniques, e.g. signposting and guiding questions, are also important as help from the teacher can lead the students to discover and generalise the target grammar rules successfully (Flowerdew 2012, Sripicharn 2010, Ur 2009).

**RESEARCH QUESTION II: WHAT ARE YOUNG THAI EFL LEARNERS’ ATTITUDES TOWARDS DDL APPROACH?**

The questionnaire and interview results show that the students have positive attitudes towards learning through a DDL method as they found it fun, interesting and challenging (Flowerdew 2012). Consequently, the majority of them wanted to study other English lessons through DDL in the future as they considered this method as a helpful resource for learning new grammatical knowledge, which is conforming to other related studies (Boulton 2010, Yepes & Krishnamurthy 2010, Nugraha, Mihtah & Wachyudi 2017). Moreover, it was found that DDL seems to help students retain their knowledge in the long term (Lin & Lee 2015, Smart 2014). An interesting result found in this study is that the DDL activities play a crucial role in transforming the students to be active learners (Lin & Lee 2015, Smart 2014) as their learners’ role is changed to be more like a researcher or a detective (John 1997). An inductive teaching method like DDL encourages the students to participate in the activities actively as they could discover and solve language problems by themselves and discuss with the classmates, which can develop their grammatical knowledge and productive skills (i.e. speaking and writing skills) at the same time. Consequently, learning through DDL creates learner autonomy (Gilquin & Granger 2010, Zohairy 2012). Thus, when students can engage in the activity and be exposed to the language directly, they tend to pay more attention to the lesson because the interesting activity can reduce the boredom in the class and enhance the positive learning atmosphere (Ur 2009). As a result, their performance in using the language and grammatical knowledge significantly improved.

However, it is worth noting that some of the participants did not enjoy learning through DDL because of the difficulties in interpreting the data. As Flowerdew (2012) suggested, DDL might be more compatible with field-dependent students because they prefer to interact with others in the class, whereas field-independent students might think that this method is too difficult for them. Some of the participants encountered difficulties while they were analysing the data. Due to the fact that they had limited English background, it was difficult for them to understand some concordance lines that contained unfamiliar words because the corpus data reflect the authentic language patterns used among the native speakers (Hughes 2010).

Therefore, in order to help these students, the teacher should put more effort in helping them get through the data by using the scaffolding techniques. Furthermore, teachers should design the paper-based DDL materials appropriately by simplifying corpus data to
suit the learners’ language proficiency, as the interview results reveal that they found the activities easier when there was some assistance from the teacher.

In conclusion, the findings of this study suggest that paper-based DDL method is beneficial for young learners in learning English prepositions, i.e. among, during and between, and the attitudes of most of the learners towards this method are positive. As mentioned in the literature review, there are few studies which researched on using DDL with young learners, the results of this present study possibly bridge the research gap and indicate that young learners or those who have limited English exposure are able to learn English grammar through paper-based DDL method with the help of the teacher in selecting appropriate concordance lines to suit learners’ proficiency and motivating them to analyse the data throughout the activities.

**PEDAGOGICAL IMPLICATIONS**

These findings can contribute considerably to the development of teaching methods among Thai teachers. Most Thai teachers usually teach grammar by using the traditional method and relying on only the textbooks which are considered the causes of the failure of Thai students in learning English grammar (Chingchit 2008, Choomthong 2014). Therefore, teaching grammar by using corpora, or *Data-Driven Learning* (DDL), could be an example of inductive teaching methods that Thai English teachers could implement in their class, as it is shown in this study that DDL significantly enhances students’ grammatical knowledge and motivates them to focus more on the lesson because they found it interesting and fun. This study also yields an instructive result that DDL can be applied with young EFL learners which could be an encouraging teaching method for EFL/ESL teachers.

**LIMITATIONS OF THE STUDY**

The study has a number of possible limitations that should be addressed in future research. The first limitation is the low number of participants. Due to the study design, which is a one group pre-test post-test, it might be difficult to ensure that the results of this study could be widely generalised to the entire population. The second limitation is the authenticity of corpus data in this study, which utilised Graded Readers Corpus. Since the Graded Readers contain simplified language that is suitable for young non-native learners to understand, the learners might not have enough exposure to the authentic language. Another limitation is that there was no inter-rater to cross-check the analysed data.

**RECOMMENDATIONS FOR FURTHER STUDIES**

Due to the limitations of this study, future studies should be replicated with other EFL participants and proficiency levels in order to increase the generalisability of the results. Moreover, future studies should be conducted with the experimental and control groups to compare the effectiveness of other grammar teaching methods with a paper-based DDL. It is also worth exploring the effectiveness of the paper-based DDL in teaching prepositions with more complexity, for example, analysing the collocations of verbs and prepositions. To increase the authenticity of the DDL teaching materials, future studies should select the concordance lines from other corpora, for example, British National Corpus (BNC) and Corpus of Contemporary American English (COCA), however, the corpus data should be appropriate for the proficiency level of the learners. Finally, future studies should investigate the long-term effects of paper-based DDL in learning grammar and use an inter-rater to determine validity or accuracy of the results of the study.
ACKNOWLEDGEMENTS

This study was supported by the Research Fund provided by Language Institute, Thammasat University.

ENDNOTES

However, the participants still produced some mistakes on verb forms and tenses because they probably thought in their L1 language when they produced English sentences. Also, the grammar lesson in this study focused on English prepositions, therefore students, non-native young learners, could not notice verb forms and tenses provided in the concordance lines due to their limited background knowledge.

REFERENCES


APPENDIX

EXAMPLE OF PAPER-BASED DDL TEACHING MATERIAL

**Instruction:** Spot the preposition and identify the followed noun phrases.

1. **high tea. Today most people have a meal **between** 12 and 2 p.m. In the past, this [P3_british_life]
2. **the garden, and there were trees **between** the pool and the house. Nutty re [B3_who_sir]
3. **and there were little holes in the wall **between** the stones. I could put my feet [B2_dracula]
4. **very carefully. I studied the days **between** 12 and 25 January, as this was t [C3_how_met_myself]
5. **most beautiful in the city. It was built **between** 1928 and 1930 by the car company [P3_new_york]
6. **sisters. Priscilla was taken to sit **between** her father and the Squire. Nancy [B4_silas_manner]
7. **report that the woman had probably died **between** 7.00 and 9.30 on the morning of [B5_jericho_dead]
8. **toothpaste, and stood up. But Anna was **between** him and the door She gave the to [B1_white_death]
9. **I put my ear against the wall **between** my room and Sandra's room, hopin [C4_matter_of_chance]
10. **or, 'If you asked me, I'd say he died **between** 7.15 and 7.45.' The doctor smile [B5_jericho_dead]
11. **Is that Mr Duncan? I thought. I looked **between** the trees and saw the sea. It's [B2_deadman_island]
12. **'And there are six doors **between** my room and the locked door?' I [B2_deadman_island]
13. **it could be any day now No I'm saying that it's, it's **between** now and Christmas Wednesdays,
14. **sit in **between** them two old men and do it. And I said I'm not sitting **between** two men. Right.
15. **the song. There were many differences **between** Paul and John. Paul was very int [P3_the_beatles]
16. **My friend saw a yellow dog running **between** people's legs, and said with a l [B4_lord_jim]
17. **ow, sir, can you tell me where you were **between** 8.00 and 9.00 on the evening of [B5_jericho_dead]
18. **sure of one thing. The love story **between** Rose and Jack was the most impor [P3_titanic]
19. **t of all the good movies that were made **between** August 1, 1927 and July 31, 1928 [P3_the_oscars]
20. **still had my army revolver and I hid it **between** the books in my bookcase, so tha [B6_meteor]

2.1 From the above concordance lines, what preposition is highlighted?
2.2 List the nouns/ noun phrases that indicate **time**
2.2 List the nouns/ noun phrases that indicate **place**
2.3 How many nouns are followed by the preposition?
2.4 What is the conjunction that links between two nouns?
2.5 Go back to the concordance lines of **during**, can you notice the differences between **during** and **between** as the prepositions of time?