Collaborative Dialogue Between Thai EFL Learners During Self-Access Computer Activities

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Previous studies have shown that second language (L2) learners use language to reflect on language form when they carry out collaborative classroom-based activities, and that they generally remember the language forms that they had discussed. The current study similarly investigated whether learners reflect on and remember language forms, but focused on learners' interaction during self-access computer activities. The language-related episodes (LREs) that occurred when Thai learners of English as a foreign language (EFL) (n = 48) carried out computer activities in a self-access environment were examined, and tailor-made tests that targeted the linguistic information discussed in those LREs were administered. The results indicated that the learners' LREs involved lexical items more often than grammatical forms, and that they successfully resolved the majority of their LREs while they were collaborating. However, their test performance indicated that they only remembered less than half of the lexical items and one-third of the grammatical forms that they had discussed. Suggestions are offered for teachers and administers interested in integrating collaborative self-access computer activities into English L2 courses.

The output hypothesis of second language acquisition emerged in the mid-1980s from Swain's (1985) observation that learners in Canadian immersion classrooms failed to achieve nativelike proficiency for some aspects of language, despite considerable exposure to comprehensible input. Swain argued that language production may facilitate second language (L2) learning in ways that complement the role of input in L2 learning, specifically by encouraging learners to notice linguistic forms in the input, test their hypotheses about how the target language works, and to use language to reflect on language use (Swain, 1995, 1998). Since originally formulating the output hypothesis, Swain (2000, 2005, 2006) has moved away from an information-processing metaphor to adopt

a broader perspective about the role of language production in L2 learning. Through reference to sociocultural theory, she has argued that using language, through speaking or writing, serves as a cognitive tool that assists in the learning process. By producing language, learners can construct and co-construct language knowledge through interactions with interlocutors and by reflecting on their own language use.

The role of language production in L2 learning has been investigated by exploring how collaborative dialogue engages learners in the process of using language to shape L2 knowledge. More specifically, collaborative dialogues between learners have been examined for the occurrence of language-related episodes (LREs), which Swain and Lapkin (1998) defined as any part of a conversation where language learners "talk about the language they are producing, question their language use, or correct themselves or others" (p. 326). However, it should be noted that researchers from a variety of theoretical perspectives have adopted LREs as a unit of analysis when investigating learner-learner interaction. For example, some researchers working within the framework of attention and noticing have taken LREs as an indication of learners' attention to form in the context of meaningful interaction (e.g., Loewen & Basturkmen, 2005; Williams, 1999, 2001), whereas researchers working within the interaction hypothesis have examined LREs in terms of the types of interactional feedback they provide (e.g., Adams, 2007; Sato & Lyster, 2007).

In the current article, LREs are interpreted as segments of dialogue that illustrate the process through which learners use language to shape L2 knowledge by talking about, questioning, or reflecting on the linguistic properties of the second language. This process of using language to shape L2 knowledge may occur when learners use their first language (L1) to talk about the second language. Previous studies have shown that in instructional contexts where learners have a shared L1 and a low level of proficiency, learners may use their L1 for a variety of discourse functions and strategies, including discussing the lexical and morphosyntactic features of the L2 (Antón & DiCamilla, 1999; Brooks & Donato, 1994; Swain & Lapkin, 2000). Because the current study is situated in an instructional context where the learners share an L1 (Thai) and have low proficiency in their L2 (English), the learners are likely to use their L1 to discuss and reflect on the linguistic features of their L2. Consequently, the function of collaborative dialogue in this context is more compatible with sociocultural theory than with theoretical perspectives that emphasize the benefits of interaction in the L2.

One focus of collaborative dialogue research has been to investigate the occurrence of LREs in a variety of instructional contexts, such as French immersion programs (Swain & Lapkin, 1995, 1998), intensive Korean as a second language programs (Kim & McDonough, 2008), German as a foreign language classes (Malmqvist, 2005), intensive ESL

programs (Fortune, 2005; Watanabe & Swain, 2007), and content-based Spanish classes (Leeser, 2004). These studies have shown that learners in these contexts use language to talk about the lexical and grammatical features of the L2 when they carry out a variety of activity types, including dictogloss and jigsaw tasks, cloze activities, multiple-choice exercises, text reconstruction, text editing, descriptive writing, oral discussions, puns and riddles, picture difference tasks, and collaborative quizzes. Previous descriptive collaborative dialogue studies have also investigated the learner factors that influence the occurrence of lexical and grammatical LREs, such as proficiency and pair dynamics (e.g., Kim & McDonough, 2008; Leeser, 2004; Storch, 2002; Watanabe & Swain, 2007; Williams, 1999).

Although the majority of collaborative dialogue research has described what types of LREs occur when learners collaborate and which variables affect their occurrence, some studies have examined whether learners remember the lexical items and grammatical forms discussed in the LREs by administering tailor-made posttests (Kim, 2008; Swain, 1998; Swain & Lapkin, 1998, 2001; Tocalli-Beller & Swain, 2007; Williams, 2001). For example, Swain (1998) investigated whether French immersion students remembered the linguistic targets of their LREs. One week after carrying out collaborative activities, the learners completed dyad-specific posttests. Swain reported that learners' retention of the LREs varied according to how they had resolved the LREs. Although 79% of the LREs that had been correctly resolved in the learners' collaborative dialogue were retained, only 40% of the unresolved LREs and 29% of the incorrectly resolved LREs were correct on the posttest. Williams (2001) also explored whether learners remember the linguistic information discussed in LREs. In her study, ESL students carried out a variety of collaborative activities in their regular ESL class. Two weeks later, they were given individual tests that targeted all the LREs that they had correctly resolved. The learners' accuracy on the tests ranged from 40% to 94% for grammatical LREs and from 50% to 94% for lexical LREs, with lower proficiency learners having lower scores than higher proficiency learners.

Because previous collaborative dialogue studies were conducted in L2 classes, many of the pair or small-group activities complemented specific language and content objectives or reinforced recently taught material (e.g., Ewald, 2005; Fortune, 2005; Kowal & Swain, 1994). Several studies also presented lessons and review activities about specific grammatical forms before learners carried out collaborative tasks (Lapkin, Swain, & Smith, 2002; Leeser, 2004; Swain, 1998; Swain & Lapkin, 2001), and modeled how learners should interact with each other and allowed them to practice (Kim, 2008; Swain, 1998). However, research to date has not examined the occurrence of collaborative dialogue when learners carry out pair or small-group activities in less structured contexts, such as the

self-access learning environment, where review activities, teacher feedback, and modeling are unlikely to occur.

Contemporary approaches to self-access learning emphasize its role in helping learners develop the language and learning skills that will allow them to become active in their learning process, work in their own way, and address their individual needs (e.g., Chan & Kim, 2004; Littlewood, 1997; Sheerin, 1997). Electronic media is assuming an increased role in self-access learning because of its ability to provide linguistic training, enable authentic communication, aid cognitive processing for grammar learning, facilitate listening and reading comprehension, provide information (particularly cultural information), and promote text processing (Funk, 1999, cited in Chan & Kim, 2004). In Thailand, the use of electronic media and self-access learning was emphasized in the most recent National Education Act and amendments (1999, 2002), and many Thai universities have begun using technology in English classes by integrating self-access computer activities into face-to-face courses, developing Web-based distance courses, requiring e-learning modules in face-to-face courses, collaborating with software companies to develop course-specific programs, and installing ready-made software programs such as *English Discoveries* (IT Edusoft) and *Tell Me More* (Auralog) in computer laboratories.

Although computer-mediated communication, in which learners interact with each other while using the computer as a medium (either synchronously or asynchronously), has been the focus of much interaction research (e.g., Pellettieri, 2000; Salaberry, 2000; Shekary & Tahririan, 2006; Smith, 2005), the nature of face-to-face oral interaction that occurs when learners do computer activities in pairs or small groups has been relatively neglected (Dunkel, 1991; Salaberry, 2001). Those studies that examined the nature of oral interaction between learners while doing collaborative computer activities (Abraham & Liou, 1991; Beatty & Nunan, 2004; Piper, 1986) enlisted volunteers to carry out computer activities specifically for research purposes. In addition, the analysis of the learners' interaction focused on discourse strategies, rather than the occurrence of language learning opportunities or outcomes. Furthermore, questions have been raised about learners' perceptions about the usefulness of technology for language learning (Ayres, 2002; Dunkel, 1991; Driver, 2002; Suh, 2002). This issue is particularly relevant for the use of technology for self-access learning because learners may not immediately recognize the relationship between the self-access activities and their class objectives. Consequently, additional studies are needed to identify the language learning opportunities created when learners work in pairs or small groups to carry out computer activities in a self-access context.

In summary, empirical research has demonstrated that lexical and grammatical LREs occur in the collaborative dialogue between L2

learners, and that learners are largely successful at remembering the linguistic information discussed in the LREs. Although a variety of classroom activities have been explored, research to date has not examined the occurrence of collaborative dialogue when learners work together to carry out computer activities in self-access context, where learners do not have access to a teacher who can provide assistance if they encounter difficulties or have questions. Previous studies have shown that teachers play an important role in guiding learners during collaborative activities, by providing instructions and modeling before the learners begin the activities, and by giving feedback and assistance while they are collaborating (Samuda, 2001; Williams, 2001). As a result, the collaborative dialogue that occurs in self-access learning environments may differ from the collaboration that has been documented in classroom-based studies, and may be associated with different learning outcomes.

RESEARCH QUESTIONS

The research questions addressed in the current study were as follows:

1. While carrying out collaborative self-access computer activities, how often do Thai EFL learners discuss lexical items and grammatical forms, and how successfully do they resolve those discussions?
2. To what extent do learners remember the lexical items and grammatical forms that they discussed?

METHOD

Context of the Study

This study was carried out at Chiang Mai University (CMU), a large public university in northern Thailand where students are admitted into undergraduate degree programs based on their national or regional entrance examination scores. Students who do not obtain the minimum entrance examination score can apply for admission into evening programs that follow the identical curriculum. However, they attend classes during the evening and on weekends and pay higher tuition rates. In terms of English instruction, CMU requires that all undergraduate students complete four integrated-skills English courses. This study involved the first integrated-skills English course, which was a task-based course with explicit learning strategies instruction. The course targeted three content areas (Thai culture, environmental problems, and television programs) and emphasized the use of English for real world activities, such as sharing information about Thailand with non-Thais and applying to

regional or international educational programs. The course assessment consisted of three oral and written task performances, a final examination consisting of tasks similar to those carried out in class, and a portfolio consisting of self-access activities that the students completed outside class to reinforce the strategies and skills targeted in the course and to encourage self-directed learning (for a detailed description of the course, see McDonough & Chaikitmongkol, 2007). The computer activities reported in this study, described in more detail in the Materials section, were offered as an optional self-access activity that the students could complete in pairs and include in their portfolios.

Participants

The participants were 48 Thai EFL first-year undergraduate students admitted to the evening program in the Faculty of Engineering (39 men and 9 women) who were enrolled in the integrated-skills English course described in the previous section. Their mean age was 18.35 years (ranging from 18 to 20 years), and they were all native speakers of Thai. They had studied English in primary and secondary schools for a mean of 10.31 years (ranging from 6 to 15 years). They rarely used English for communication outside class but were exposed to English through mass media, such as music, movies, and the Internet. They reported using computers in their dormitory rooms, in the university computer laboratories, and in Internet cafes for a mean of 11.78 hours per week (ranging from 3 to 30 hours), typically for browsing the Internet, playing games, emailing friends, and chatting.

Materials

Computer Activities

The computer activities were part of the basic level of *English Discoveries*, a multimedia software program for English language instruction distributed by IT Edusoft. The program was purchased by the Faculty of Engineering and installed in their computer laboratories to provide students with self-access resources for learning English. The basic-level *English Discoveries* activities consisted of (a) listening and reading activities that targeted a variety of texts, including news, advertisements, drama, music, radio shows, postcards, narrative stories, and newspaper articles; (b) speaking activities based on conversations that students listened to and then recorded; and (c) language games that targeted vocabulary, grammar, and writing. The activities had many multimedia features, such

as animation, graphics, video clips, and voice recording, and individualized features, including speed control for listening texts, dictionary function for reading texts, explicit metalinguistic explanations for grammar activities, and visual speech displays. The researchers reviewed all the activities in the basic level of *English Discoveries* and identified 25 activities that were most relevant to the content of the learners' integrated-skills course. The learners were provided with a list of the 25 activities suggested by the researchers, but they could complete any activity in the *English Discoveries* basic-level program.

Oral Tailor-Made Tests

The tailor-made tests were created by the researchers to assess whether the learners remembered the language forms they had discussed in the LREs. The tailor-made tests consisted of items that required the learners to supply information about English words or forms, which have been referred to as *suppliance items* in previous studies that administered tailor-made tests (e.g., Loewen, 2005; Shekary & Tahririan, 2006). Although the exact wording was not duplicated, the context of the original LREs formed the basis of the test items. For lexical items the learners were told the meaning of an English word in English or Thai or both, along with a hint in the form of the first letter of the English word. Then they were asked to supply the English word that corresponded to the provided meaning. For example, one pair had discussed the meaning of the word *dirty* while doing a listening exercise. On their tailor-made test they were given the word สกปรก [dirty] and asked to provide the English word beginning with the letter *d* that had the same meaning. Alternatively, the learners were provided with an English word in the same context that had occurred in an LRE and asked to supply the meaning of that word in Thai or English. For example, one pair had discussed the meaning of the word *neighbor* while they were carrying out a listening exercise. On their tailor-made test, they were given the word *neighbor* used in an English sentence, and then asked to supply its meaning.

For grammatical forms, learners were provided with a Thai phrase or sentence and asked to supply the English translation. For example, one pair had discussed the correct word order to use when asking a person where they were from during a speaking activity. On their tailor-made test they were given the Thai translation of that question and asked how they would say it in English. Alternatively, they were given a sentence or conversation in English with a missing word or phrase. They were given the meaning of the missing word or phrase in Thai and asked to complete the blank with the appropriate English form. For example, one pair had discussed the past tense form of the verb *speak* during a grammar

exercise. On their tailor-made test, they were given the following sentence "Earlier this morning I _____ to my mother" and asked to fill in the blank with the appropriate form of the English word that means "พูด" [speak].

Because the tailor-made tests were administered orally, the researchers spoke either Thai or English (or both) when asking the learners to supply English words or forms. The tests typically contained all of the LREs that were identified immediately after the learners completed their collaborative dialogue. However, the maximum number of test items was set at 13 because of the time constraints associated with administering individual tests orally. If a pair had more than 13 LREs, a subset of LREs was selected for inclusion on the tailor-made test. The LREs to be tested were selected to represent the entire laboratory session (as opposed to the first 13 LREs to occur) and to include LREs that involved both lexical items and grammatical forms when possible.

Questionnaire

A final written questionnaire in Thai was created by the researchers to elicit the learners' perceptions about the usefulness of collaborative self-access computer activities for English language learning. The final questionnaire contained nine open-ended questions about peer collaboration, the computer activities, the tailor-made tests, and the relationship between the computer activities and their EFL course. It also included five scalar-response items about their motivation for doing the computer activities, how often they did them, the usefulness of various activities for learning the course content, and their satisfaction with the computer software.

Procedure

The students were informed by their English teachers that they could complete the *English Discoveries* computer activities as part of their portfolio assignment, and could do the computer activities with a partner in a laboratory staffed by two assistants who would be available to answer any technical or language questions. After self-selecting a partner and receiving a login name and password, the learners attended an orientation session in which they were shown how to login, access the software, and navigate the activities. When learners attended the staffed computer laboratory, each pair was seated at one computer equipped with two sets of headphones and Divace Duo audio-recording software, which captured all of their interactions. Their computer usage was monitored by the assistants using ICM 4.0, which allowed them to determine whether

the recording software was working properly and whether the learners were completing *English Discoveries* activities, as opposed to surfing the net or chatting. The assistants also answered any technical or language questions but otherwise did not participate in the interaction between the learners or monitor their language use. In addition, they did not impose any time constraints, so that each pair of learners could decide how much time they wished to spend on the computer activities in any given week.

Immediately after the computer sessions, the assistants listened to the recordings and compiled a list of the LREs that had occurred in the collaborative dialogue between each pair. Because of time constraints, the entire session could not be transcribed immediately, so only LREs (defined in the following section) were transcribed. The researchers then created tailor-made tests to target the LREs that had been identified and transcribed. An assistant administered the tests orally to each learner individually at the beginning of the next laboratory session, which was typically 7–12 days later. Although tailor-made tests were administered to every learner in the next laboratory session that they attended, only those learners who took the tailor-made test within 12 days of the computer session were included in the subsequent analysis. Each learner's test performance was recorded using an mp3 recorder. The same cycle of learner collaboration, identification of LREs, and creation and administration of tailor-made tests was repeated from weeks 3 to 13, and in weeks 14 and 15 the learners completed the final questionnaire.

Analysis

At the end of the semester, complete transcriptions of the learners' collaborative dialogues were made by the assistants and checked by the researchers. The transcripts were analyzed in terms of the occurrence and resolution of LREs. First, the LREs were identified following Swain and Lapkin's (1998) definition as any part of a conversation where language learners "talk about the language they are producing, question their language use, or correct themselves or others" (p. 326). If the learners discussed the same linguistic item on multiple occasions during one conversation, it was only coded once. Each LRE was also classified as either lexical or grammatical. Lexical LREs were defined as LREs in which learners talk about or seek the meaning, spelling, or pronunciation of lexical items. In Transcript 1, the learners were completing a listening activity in which they had to listen to a conversation and complete comprehension questions. When learner 1 asked about the meaning of the word *trip*, his partner provided the Thai translation, and they continued answering the comprehension questions.

Transcript 1

Learner 1: trip แปลว่าอะไร
(what does trip mean?)
Learner 2: trip แปลว่า trip ในการท่องเที่ยวน่ะ
(trip means kaan thɔ̂ŋ thiâw)[1]

Grammatical LREs were defined as LREs in which learners talk about an aspect of English morphology or syntax, as shown in Transcript 2. In this example the learners were completing a conversation by selecting the appropriate verb forms, and discussed whether the appropriate form was *go* or *went*.

Transcript 2

Learner 1: I go
Learner 2: ไม่ใช่ went เหรือ
(isn't it went?)
Learner 1: went เหรอ มัน today ไม่ใช่เหรอ
(went? It's today, isn't it?)

The resolution of each LRE was coded as correct, unresolved, or incorrect, which have been referred to in previous research as Type I, Type II, and Type III outcomes, respectively (Leeser, 2004; Malmqvist, 2005; Swain, 1998). If a pair discussed a linguistic item multiple times during one conversation, their resolution of the last LRE targeting that linguistic item was coded. Correctly resolved LREs were defined as LREs in which the learners correctly self-repaired, other-repaired, answered a question, or found a solution, as previously illustrated in Transcript 1. Unresolved LREs were defined as LREs in which learners did not seek the answer, know the answer, or agree about the correct answer. An unresolved LRE is illustrated in Transcript 3.

Transcript 3

Learner 1: smart แปลว่าอะไร
(What does smart mean?)
Learner 2: ไม่รู้ะ
(I don't know)

Incorrectly resolved LREs were defined as LREs in which the learners incorrectly self-repaired, other-repaired, answered a question, or found a solution, as shown in Transcript 4.

Transcript 4

Learner 1: daughter นี่แปลว่าอะไรวะ
(what does daughter mean?)

[1] The Thai script was Romanized following Haas (1964).

Learner 2: เป็นเพื่อน
(phŷan [friend])

For the test data, the learners' oral performance on the tailor-made tests was transcribed by the assistants and checked by the researchers. Their answers to each test item were scored as correct or incorrect. For lexical items in which learners were asked to provide an English word, the answer on the test had to be identical to the lexical item discussed in the LRE as opposed to a synonym. Interrater reliability for the collaborative dialogue and test data was calculated by comparing the coding of one researcher with the coding of independent raters who scored either a subset of the LRE data (25%) or the test data (25%). Simple percentage agreement between the researcher's coding and the independent rater's coding was 88% for the identification of LREs (Cohen's kappa = 0.57), 88% for the resolution of LREs (Cohen's kappa = 0.78), and 97% for the test data (Cohen's kappa = 0.93). Disagreements were resolved through discussion, typically deferring to the person who had greater familiarity with the computer activities or had administered the posttest. Due to the number of planned comparisons and the associated risk of Type 1 error, alpha was set conservatively at 0.01 for all statistical tests.

RESULTS

Description of the Data Set

The data set consisted of the collaborative dialogues that occurred when the 48 learners worked in pairs ($n = 24$) to carry out the self-access computer activities. Because the number of collaborative dialogues per pair varied (from one to five), depending on how often they attended the staffed computer laboratory sessions, one collaborative dialogue from each pair was selected for inclusion in the data set. For those learners with multiple recordings, the collaborative dialogue selected for analysis contained a variety of LREs for which there were corresponding test items when possible. The dialogues included in the data analysis occurred at various times throughout the semester, representing weeks three (5), four (6), five (4), seven (4), nine (2), and ten (3). The learners completed a variety of different computer activities while collaborating, including listening comprehension (20), language games (12), speaking practice (10), and reading comprehension (5).

Because the learners completed the computer activities in a self-access environment, there was variation in the length of each session, which ranged from 45 to 110 minutes ($M = 70.29$, $SD = 14.32$), and the entire data set consisted of 1687 minutes, or approximately 28 hours,

of audio-recordings. Separate Kruskal-Wallis tests (nonparametric ANOVAs) indicated that there were no significant differences in the length of the collaborative dialogues based on the week in which they had occurred ($\chi^2 = 9.11$, $p = 0.105$) or whether the dialogue was a pair's first or subsequent session ($\chi^2 = 1.83$, $p = 0.176$). In other words, neither learners who carried out multiple sessions nor learners who completed the activities at the end of the session had longer collaborative dialogues.

Occurrence and Resolution of LREs

To address research question one, which asked about the occurrence and resolution of LREs, the number of lexical and grammatical LREs that were correctly resolved, unresolved, and incorrectly resolved in each collaborative dialogue were totaled. The learners' collaborative dialogue contained a total of 300 LREs, of which 76% (227/300) were lexical and 24% (73/300) were grammatical. Each pair discussed a mean of 9.46 lexical LREs ($SD = 6.76$) and 3.04 grammatical LREs ($SD = 2.84$).[2] A Wilcoxon signed ranks test for related samples (a nonparametric paired-samples t test) confirmed that the difference in grammatical and lexical LREs was significant ($Z = 3.20$, $p = 0.001$, $\eta^2 = 0.45$). Because there were significantly more lexical LREs than grammatical LREs, resolution patterns were calculated as proportion scores. As shown in Table 1, the proportion of correctly resolved LREs was higher for grammatical LREs (0.84) than for lexical LREs (0.70). The proportion of unresolved LREs was higher for lexical LREs (0.25) than for grammatical LREs (0.13), and the proportion of incorrectly resolved LREs was higher for lexical LREs (0.08) than grammatical LREs (0.03). Individual Wilcoxon signed ranks tests for related samples indicated that the differences in resolution patterns were not significant.

Segments from the learners' collaborative dialogues and their responses on the questionnaire provide greater insight into the quantitative findings about the occurrence and resolution of LREs. In the examples below, Somjet and Theera, who had 31 lexical LREs but only one grammatical LRE, were listening to short conversations and answering comprehension questions. At the beginning of the conversation, Somjet took a more active role in initiating their lexical LREs by asking Theera what various English words meant. For example, in Transcript 5 they had just finished listening to a short conversation that included the lexical items *aunt* and *grandmother*.

[2] There was no significant relationship between the length (in minutes) of the collaborative dialogues and the occurrence of LREs (Spearman's $\rho = 0.377$, $p = 0.069$).

TABLE 1
Proportion of LREs by Resolution and Type

	Lexical		Grammatical			
	M	SD	*M*	SD	*Z*	*p*
Correctly resolved	0.70	0.26	0.84	0.21	1.85	0.064
Unresolved	0.25	0.24	0.13	0.20	1.59	0.113
Incorrectly resolved	0.08	0.12	0.03	0.08	2.35	0.019

Transcript 5

Somjet: aunt แปลว่าอะไร
(what does aunt mean?)
Theera: ป้า
(paâ [elder aunt])
Somjet: เหรอ แล้ว grandmother ละ
(oh and grandmother?)
Theera: แปลว่าย่า
(it means jaâ [paternal grandmother])

As the conversation continued, Theera began to initiate lexical LREs by similarly asking Somjet what English words meant, as shown in Transcript 6, where they had just finished listening to a conversation between two people talking about the types of music they like. They were discussing possible answers to a comprehension question when Theera asked about the meaning of the word *agree.*

Transcript 6

Theera: ไม่เห็นไอ้เหี้ยบอยเคยมาทำเลยวะ
(I don't see the answer. Haven't you done these before?)
Somjet: นี่เหละ ไม่ใช่ กูว่าน่าจะเป็น agree
(this one, no, I think it should be agree)
Theera: agree แปลว่าอะไร
(what does agree mean?)
Somjet: ตกลง
(tògloŋ [agree])
Theera: Yes. ฉันตกลง He is great
(yes, I agree. He is great)

Throughout their collaborative dialogue, Somjet and Theera resolved 20/31 lexical LREs correctly and participated fairly equally in those LREs by both asking and answering questions about lexical items.

As these examples illustrate, the learners primarily focused on lexical items and relied on translation to Thai to understand the meaning

of English words. In terms of their perceptions about the benefits of collaboration, Somjet and Theera both mentioned on the questionnaire that working with a friend was helpful for understanding vocabulary. On his questionnaire, Somjet wrote the following comment when asked if working with a friend was helpful: "When we don't know a word, if our friend knows they can tell us,"[3] and Theera stated that "sometimes if we can't translate, our friend can translate for us." Overall, 43/48 learners stated in an open-ended question that they preferred to work with a friend rather than work alone when doing the computer activities. The most frequent reasons they listed were providing each other with general assistance (18) and asking each other about vocabulary (14). Interestingly, only three learners mentioned assistance with grammar as a reason why working with a friend was helpful. The learners' perception that collaboration was useful for vocabulary and their relatively low proficiency in English may help account for the significantly higher number of lexical LREs than grammatical LREs. In sum, the findings for research question one suggest that learners focused on lexical items more often than grammatical forms were largely successful at resolving both kinds of LREs and perceived collaboration as being helpful, especially for vocabulary.

Remembering the Linguistic Forms Discussed in LREs

The learners' performance on the tailor-made posttest was analyzed to address research question two, which asked to what extent learners remember the linguistic information discussed in their LREs. Only test items that targeted LREs that had been resolved correctly were included in the analysis. If learners had been unable to resolve or incorrectly resolved an LRE while they were collaborating, it was deemed unlikely that they would encounter the correct resolution later, because their exposure to English outside class was limited and their English teachers did not review the content of the computer activities during class. Learners whose tests did not include items derived from both correctly resolved lexical LREs and correctly resolved grammatical LREs were excluded (n = 14), with the resulting dataset consisting of 34 learners who completed 106 lexical test items and 82 grammatical test items. As shown in Table 2, they remembered 48% (51/106) of the lexical items they had discussed, but remembered only 28% of the grammatical forms they had talked about (23/82). A Wilcoxon signed ranks test for related

[3] The learners completed the questionnaire in Thai, which was translated to English by the researchers.

TABLE 2
Posttest Results

	Number of test items	Sum correct	Mean correct	SD	Z	p	η^2
Lexical LREs ($n = 53$)	106	51	1.50	1.24	2.93	0.003	0.26
Grammatical LREs ($n = 41$)	82	23	0.68	0.89			

samples indicated that the learners remembered significantly more lexical items than grammatical forms.[4]

As the quantitative findings have indicated, the learners were not successful at remembering the linguistic information discussed in the LREs that they had correctly resolved, although they were more successful at remembering lexical items than grammatical forms.

The learners' difficulty in remembering the linguistic forms they had discussed in the LREs is illustrated in the following examples. The learners in Transcript 7 were doing a listening activity in which they listened to short conversations and answered comprehension questions. Karn asked his partner what the word *sidewalk* meant. After Sasithorn provided the correct translation, they continued discussing the comprehension questions.

Transcript 7

Karn: sidewalk แปลว่าอะไร
(what does sidewalk mean?)
Sasithorn: ทางเดิน เอ่อ ฟุตบาท
(thaaŋ dəən uh footpath)

On the tailor-made test, the learners were asked to supply the English word beginning with the letter *s* that meant **ฟุตบาท** [footpath]. Both learners said that they did not know the answer, which was surprising because Sasithorn had provided the correct translation while they were collaborating.

The tendency for learners to correctly resolve an LRE but not remember the form on the posttest occurred more often for grammatical LREs. The learners in Transcript 8 were discussing which form of the verb *go* they should use in the sentence "Usually Peter ____ swimming on the weekends." Although they initially thought the correct form was *went*, Sathit realized that the sentence described an activity that Peter does

[4] There was no significant relationship between the learners' test performance and the proportion of LREs included on their tailor-made posttest (Spearman's $\rho = 0.266$, $p = 0.129$). In other words, it was not the case that learners who had fewer LREs, and therefore were tested on all of their LREs, scored higher on the posttest than learners who had many LREs but were tested on only a subset of their LREs.

regularly so the correct form was *goes*. When Malika questioned the answer, Sathit repeated the reason that *goes* was the correct answer.

Transcript 8

Sathit: went went
Malika: went เหรอ
(went?)
Sathit: เฮ้ย! ทุกๆน่ะ ทุกๆ go สิ
(hey! It's every. Every so go)
Malika: go เหรอ
(go?)
Sathit: go ตัวนี้ es สิ
(go. This one—'es')
Malika: นี่เหรอ
(this one?)
Sathit: เออ มันไปทุกๆ ประจำใช่ป่ะ
(mhm. He goes every time, regularly, right?)
Malika 2: เออ
(mhm)

Despite correctly resolving this grammatical LRE, neither Sathit nor Malika answered the target item correctly on the tailor-made test. On the test, they were given the sentence "Usually he _____ to work every day at 9 am" and asked to complete the sentence with the correct form of the English verb that means "ไป" [go]. Sathit answered that the correct form was *go,* whereas Malika answered that the correct form was *went.*

Transcripts 7 and 8 illustrate that both learners in a pair often performed similarly on the posttest, regardless of the role they had taken in the original LRE. However, it is possible that the learner who provides an answer during an LRE might be more likely to remember that form than the learner who asked the question. To clarify whether learners' roles in the initial LREs influenced their test performance, each item on the posttest was considered in terms of whether a learner had asked a question or provided an answer in the LRE. Table 3 lists the lexical items that the learners remembered on the posttest and indicates their role in the initial LRE. For most pairs, both learners performed similarly with either both learners remembering the word (36%) or neither leaner remembering the word (38%). For example, both learners in pair three remembered the meaning of the words *museum* and *house* but did not remember the meaning of the words *here*, *hear*, and *salesperson*, and there were no words that only one learner remembered.

However, when only one learner in a pair remembered the word on the posttest, that learner was more likely to have provided the answer during the initial LRE (23%) than to have asked the question (4%). For example,

TABLE 3
Posttest Results for Lexical Items by Pair and Learner

Pair	# of words	Learner who asked question	Learner who provided answer	Both learners	Neither learner
1	2	—	Museum	—	Salesperson
2	4	—	—	Here, hear	Salesperson, neighbor
3	5	—	—	House, museum	Here, hear, salesperson
5	3	—	—	Full, have	Husband
6	7	—	Price, daughter, terrible	Full, guard	Suit, broken
8	1	—	—	—	Know
10	5	Cash	—	Museum, husband	Trip, Spanish
12	1	—	—	—	Neighbor
13	3	—	—	Bed, cash	Living room
14	1	—	—	—	Fantastic
15	4	—	Cash, interesting	Teacher, husband	—
16	1	—	—	Do	—
17	2	—	Trying	More	—
19	6	Grandmother	Aunt, expensive, agree	Weak	Sidewalk
21	5	—	Cash	Here	Neighbor, hear, trip
23	1	—	—	Tree	—
24	2	—	Visit	—	Taking
Sum	53	2 (4%)	12 (23%)	19 (36%)	20 (38%)

Note. Percentages have been rounded.

in pair six, the learner who had provided the answer during the LREs remembered the meanings of the words *price, daughter,* and *terrible,* whereas her partner, who had asked about these words in the LREs, did not remember any of them. There were only two instances in which the learner who asked about the word remembered the meaning on the posttest but the learner who had provided the answer did not remember. The learners' performance on the grammatical items was similar, with the majority of the forms (63%) remembered by both learners or by neither learner within a pair (complete grammar results are provided in the appendix). However, when just one learner in a pair remembered the grammatical form on the posttest, the learner who had provided the answer (20%) was only slightly more likely to remember than the learner who had asked the question (17%).

Despite their relatively low posttest scores, 45/48 learners reported on the questionnaire that they perceived the computer activities as helpful or very helpful for learning English. When asked to specify what was helpful, they most frequently commented that the computer activities helped them practice the language forms and content that they studied in their integrated skills course. They also remarked about the value of the computer

activities for helping them know vocabulary words in English. In summary, the findings for research question two suggest that the learners were not particularly successful at remembering the linguistic forms they had discussed in the LREs. Although there was some variation in posttest scores based on whether a learner had asked or answered a question in the initial LRE, overall both learners within a pair performed similarly. And despite their relatively low scores on the posttest, the learners believed that carrying out the computer activities was helpful for learning English.

DISCUSSION

To summarize the findings, the collaborative dialogues between these Thai EFL learners contained numerous segments of conversation in which they used language to talk about L2 language forms, which confirms the findings of previous classroom-based research (Kim, 2008; Kim & McDonough, 2008; Kowal & Swain, 1994; Lapkin et al., 2002; Leeser, 2004; Storch, 1998; Swain & Lapkin, 2000; Williams, 1999). Collaboration in this instructional context, the self-access environment, similarly created opportunities for learners to use language to talk about language and to arrive at correct solutions, despite the absence of explicit instruction, modeling, and teacher feedback. When discussing lexical and grammatical forms, the learners were able to resolve their problems and answer their questions correctly, rarely arriving at an incorrect solution. However, their ability to reach correct solutions in their collaborative dialogues did not always correspond to the ability to remember that information during the posttest, especially for grammatical forms. Previous students which targeted low-proficiency learners also found lower posttest scores for both lexical items and grammatical forms (ranging from 40% to 50% in Williams, 2001).

An important question then is why the learners did not remember the linguistic information in the LREs they had correctly resolved. One possible explanation is that the learners simply had little incentive to remember the language items they had discussed. Although the computer activities were selected to complement the objectives of the learners' required English course, the activities were not identical to the tasks they completed in class. In addition, the learners' English teachers were never present in the computer laboratory and had little knowledge of which specific activities the learners were doing, so the content of the computer activities was not reinforced during class time. In order to encourage greater subsequent use of the language forms discussed in LREs, teachers might tailor the content and objectives of the self-access activities to reinforce the content and objectives of their face-to-face class. By matching the objectives of self-access activities and face-to-face courses, teachers can provide learners with greater exposure to target forms in a wider variety of contexts. As a result,

learners might perceive the self-access activities as more relevant for L2 learning, which could provide them with greater incentive to remember and subsequently use the language forms they had discussed.

Another possible explanation for the learners' low retention rate is that their extensive use of the L1 may not have created an ideal environment for fostering L2 learning. The learners spoke their L1 rather than their L2, which supports the findings of previous classroom-based collaborative dialogue studies (Antón & DiCamilla, 1999; Brooks & Donato, 1994; Swain & Lapkin, 2000). However, the learners spoke the L1 almost exclusively, which is much more frequent than has been reported previously. Although use of the L1 certainly supports L2 learning, many of the beneficial functions of language production, such as hypothesis testing, noticing, automatic retrieval of linguistic forms, and syntactic processing, may not arise if learners speak the L1 exclusively. One way to enhance the benefit of self-access computer activities is to encourage learners to produce the L2 while they are collaborating. Although it seems unlikely that teachers could be present in the computer laboratory at all times, they could reinforce the importance of using the target language during the face-to-face classes. In addition, learners may be more likely to produce the L2 during self-access activities if those activities provide opportunities for them to practice the production tasks they are expected to complete in their face-to-face class.

Another factor that could have influenced the learners' posttest performance is their perceptions about the value of peer interaction for L2 learning. Previous research has shown that learners prefer to rely on their L2 teachers for knowledge and may be less likely to consider peers as useful resources for learning (Davis, 1997; Jones, 1992; Mackey, McDonough, Fuji, & Tatsumi, 2001; McDonough, 2004; Williams, 1999). For example, Mackey et al. (2001) reported that a group of learners had discussed the meaning of a lexical item and arrived at the correct solution. However, after arriving at this solution, they then called the teacher over to confirm the correctness of their answer. And when they reported this lexical item in their learning journals, they identified the teacher as the supplier of information instead of their peers. In the self-access environment reported here, the learners were not able to confirm their intuitions with a teacher or other language authority. Consequently, they may not have believed that their LREs were resolved correctly, or that the information discussed in those LREs was worth remembering. To encourage learners to remember the linguistic information provided by peers, teachers may want to discuss the benefits of peer interaction, provide examples of how learners have given each other correct information, and demonstrate how that information can be used in subsequent tasks.

Finally, when learners carry out self-access activities, they are not able to direct requests for assistance to a teacher, which is a common occurrence

when learners carry out collaborative activities in L2 classrooms, particularly for lower proficiency learners (Williams, 2001). Because they do not have access to a language teacher, learners should be made aware of the other linguistic resources that are available. For example, *English Discoveries* includes several resources, such as a dictionary and metalinguistic explanations that learners can consult if they encounter unfamiliar words or grammatical forms. However, when asked on the final questionnaire whether they used these features, nearly two-thirds of the learners (31/48, 65%) replied that they never used any of the resource tools. In order to make self-access activities more beneficial, teachers may need to provide more intensive initial training so that learners are aware of available linguistic resources and know how to access those resources when needed.

CONCLUSION

The current study has focused on the collaborative dialogue that occurs when learners work together to carry out self-access computer activities. The specific computer activities used in this study were part of the *English Discoveries* software program, which were selected because the program had already been purchased and installed in the university computer laboratories. Although these activities accurately represented the self-access resources available at CMU, they did not provide learners with complete freedom to select their own materials. Future studies might investigate whether the collaborative dialogue that occurs when learners have greater autonomy to select self-access materials differs from the interaction reported here or is associated with different learning outcomes. And because learners may be unfamiliar with the linguistic resources available in software programs, additional research is needed that identifies effective ways of helping learners take advantage of these tools. Finally, further innovation in assessing whether learners remember the linguistic information discussed in LREs would be valuable. For example, the use of multiple comprehension and production measures might elicit more detailed information about what language forms learners remember and subsequently produce. In addition, if particular lexical items or grammatical forms are commonly discussed, those items could be incorporated into additional measures that could be administered to the entire group and be used to augment the interpretation of tailor-made tests.

In conclusion, the current study has shown that Thai EFL learners can successfully resolve their linguistic problems and find correct answers to their questions when they work together to carry out self-access computer activities. However, it has also demonstrated that learners may have difficulty remembering that linguistic information, which highlights the need to identify effective ways to help learners apply the information that

they obtain through collaboration to subsequent language tasks. Clearly, many issues related to collaborative dialogue require further investigation, especially how collaborative dialogue in self-access environments contributes to L2 learning. As the use of technology in L2 instruction expands, studies that describe how learners use computers to interact with each other are valuable, as are studies that investigate how learners interact with each other to use computers.

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APPENDIX

Posttest Results for Grammatical Forms by Pair and Learner

Pair	Number of forms	Learner who asked question	Learner who provided answer	Both learners	Neither learner
1	2	—	Copula	—	Question formation
2	4	Dummy it	—	—	Copula, question formation, present progressive
3	1	—	—	—	Question formation
5	2	—	Copula	—	Dummy it
6	2	—	Question formation	—	Present progressive
8	7	Question word, past simple, question formation	Dummy it, present simple	—	Pronoun, auxiliary verb
10	2	—	—	—	Article, simple past
12	2	—	—	Simple present	Present progressive
13	2	—	—	—	Question formation, copula
14	3	—	Negation	—	Simple past (2)
15	2	Copula, question formation	—	—	—
16	2	—	Past simple	—	Question formation
17	5	Auxiliary verb	—	—	Present simple, present progressive, question formation (2)
19	2	—	—	Count/noncount noun (2)	—
21	1	—	—	—	Present progressive
23	1	—	Simple past	—	—
4	1	—	—	—	Article
Sum	41	7 (17%)	8 (20%)	3 (7%)	23 (56%)