

Social Dimensions of Peer Interaction: Primary School Children Working with English Learning Software

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Choi, Heekyong. 2003. **Social Dimensions of Peer Interaction: Primary School Children Working with English Learning Software.** *Korean Journal of English Language and Linguistics* 3-3, 453-497. The purpose of this study is to investigate social aspects of young EFL learners' interaction at the computer. Data were taken from the interactions of three pairs of fourth-grade primary school children who worked together on English learning software. Their interactions at the computer were videotaped and then all the talk produced by the students and the utterances emitted from the computer were transcribed. As for the analytical tools, the notion of 'contextualization cues' (Gumperz, 1982) and the concept of 'positioning' (Davies & Harre, 1990) were employed. The analysis reveals that the roles of the students were not tied to a certain position, but rather dynamically changed during the course of interactive work according to the situation at hand. The dynamic changes in their positions were realized through various means; their capability in solving problems, their taking responsibility or assigning it to each other, or cooperation. There were also instances of peer teaching and motivated learning. In addition, the students showed autonomy in their learning activity. These findings suggest that both students in a dyad had their own place in performing task activities, contributing to solving problems and getting benefits from peer interaction. Furthermore, students' working together on English learning software may provide an environment which can promote cooperative attitude and responsibility for learning and enhance motivation and autonomy in their learning process.

Key Words: discourse analysis, English learning software, peer interaction, social dimensions

1. Introduction

Recently the role of learners in their own learning process has been emphasized in the field of second language acquisition. At the same time, the issue of learner autonomy in language learning has been spotlighted. Cotterall (1995) provides several reasons why learner autonomy is considered desirable. According to her, learners who make choices and decisions about the pace, sequence, mode of instruction and even the content of what they are studying may learn more, and more effectively, show an increase in enthusiasm for learning and feel more secure in their learning. Besides, learners may become more efficient in their language learning if they do not have to spend time waiting for the teacher to help them with resources or solve their problems.

In general, learners who are autonomous take some responsibility for their own learning by setting their own goals, planning practice opportunities, or assessing their progress. But how can language teachers provide an environment in which learners behave in this way?

As a way of making learners more actively engaged in their own learning activity, cooperative small group work has been encouraged in classrooms. A large body of research has reported that properly structured cooperative learning activities have a positive effect on various aspects of learning: academic achievement, social development, and personal development, such as increased self-esteem and an increased sense of intellectual competence. However, there are only a few studies which have looked at the detailed aspects of the interactive processes of small group work. Duran and Szymanski (1995), through the detailed analysis of discourse that occurs during writing activity, show that peers act as a powerful language learning resources by correcting and providing a word for writing a story.

Through the evaluative feedback and responses to it, students are acquiring self-identities as learners who are responsible for

their own academic performance. Swain and Lapkin (1998), addressing the role of the students in their collaborative writing activity, point out that although a difference in proficiency level between the students suggests that a possible expert and novice relationship might exist, neither student dominated during their pair work and both contributed in important ways to the collaborative activity.

Considering the argument, it may be misleading to portray each participant as having a single role in a jointly constructed activity. Furthermore, there are studies about the social structure of encounters in other than educational settings such as between employer and employee (Gavruseva, 1995) or doctor and patient (ten Have, 1991). They reveal that interactional asymmetry is a product of locally managed discourse rather than a reflection of the interlocutors' exogenous identities. Yet, some research (e.g., Gonzalez-Edfelt, 1990) on peer interaction still provides a static view of social relationships between interactants by depending on their initial social or cognitive status in interaction such as their second language proficiency.

In the area of teaching materials, computer technologies have been considered a potential tool for language learning. Computers can promote two central aspects of communicative language teaching; interaction and learner-centered learning (Al-Arishi, 1994). Modern programs can bring virtual realism into the classroom through multimedia capabilities (Kang & Dennis, 1995). A learner-centered learning environment is fulfilled by the computer's capability of providing individualized, self-paced, and non-linear learning (Stevens, 1989). Besides, the growing role of the computer, especially in EFL learning, is partly in that it can promote learners' motivation and autonomy (Healey, 1999).

However, individual work with the computer program has the potential of becoming an imitation of the isolation-booth learning experiences of audio-lingual method laboratory students (Stone,

1992). Although it provides oral input and involves turn-taking similar to that in spoken interaction, the interaction between human and machine is limited in many ways (Kleifgen, 1992). This limitation of the computer suggests the possible alternative of using the computer in a small-group setting.

Computer-based small group work can be a potentially productive learning environment. A number of studies (e.g., Mehan, 1989; Gonzalez-Edfelt, 1990; Lee, 1993) claim that computer use can promote new ways of working together, productive peer teaching, as well as high quality social interaction. Learners may have more incentive to keep the interactive work going because the computer can dynamically and constantly provides visible outcomes and new problems; that is, the computer can mediate interaction among students in a more meaningful way.

There has been research on the interaction among the participants engendered around the computer. The majority of these studies (e.g., Piper, 1986; Abraham & Liou, 1991) examined only quantitative linguistic aspects of the interaction to find out its value in terms of oral practice in second language. As a result, it did not give us detailed information about the nature and process of peer interaction. Thus, we need more research that can provide qualitative information about the social aspects of interaction. This study will take a close look at the social characteristics of young EFL learners' interaction which occurs when they are working in dyads on an English learning software program.

2. Method

2.1. Setting and Participants

Data were collected at one of the primary schools in Seoul, Korea. The school used computers for a regular fourth grade

EFL class, although the class took place in a classroom where there was only one computer connected to a big screen TV. It also offered students an extracurricular after-school activity called Computer English class. The researcher observed several fourth-grade English classes. The researcher could see that students were eager to interact directly with the computer by themselves through controlling the mouse, and the English teacher tried to give each student an equal opportunity to do so. As a result, the same activity with the same content kept being repeated. It is clear that the faculty needs to work on developing teaching models for using computers in EFL classes.

The data for this study were taken from the interactions of three pairs of the fourth-grade children. They have had one year of experience in learning English in their classrooms. The English teacher selected these participants from among students who had volunteered to participate in this study and they formed self-selected pairs. The summary information about the participants is shown on Table 1.

Table 1
Formation of pairs among the participants

	Pair A	Pair B	Pair C
Name	B1-G1	G3-G4	B2-G2
Class	Class 1	Class 1	Class 2

Note: Students gender and numerical numbers are used for their names.
B is for boys and G for girls.

The participants' experience in using computers varied along with their EFL learning background and their relationship with their partner. Pair A were also partners in the classroom. B1 took a computer course offered as an after-school activity and had a computer and software at home. He had never taken the after-school English Conversation class, but had been taking the Computer English class for two years. Thus, he had been

exposed to several software programs like *Just Grandma and Me* and *Arthurs Reading Race*. G1, B1s partner, on the other hand, did not have a computer at home. She did not have any experience of working at the computer except in the fourth grade English class. But she had studied English at home using an audiotape recorder and workbooks for one year when she was a second grader.

Pair B consisted of two girls, G3 and G4, who were best friends. G3 had a computer at home, but she did not work at the computer since she did not have any software to play with. She had taken the Computer English class when she was a second grader. So she had been exposed to *Just Grandma and Me*. She had not taken the English Conversation class, but she had had experience in learning English through workbooks and audiotapes for one year when she was in second grade. Her partner, G4, started to learn English only when she became a third grader. She did not have any previous experience of working at the computer except at her cousins house.

Pair C were also in the same class. B2 had been working on the EFL learning computer programs such as *Little Monster at School* at home. He had also been taking the Computer English class for one and a half years and he was familiar with programs like *Just Grandma and Me* and *Arthurs Reading race*. He had also started taking English Conversation class at the beginning of fourth grade. However, his partner, G2, did not have any experience of working at the computer except at her friends house and in the regular fourth grade EFL class. She had not taken any extracurricular English lessons, either.

2.2. Software

The software program that the students worked on is *Marus English Adventure* produced in 1996 by a private company. The program is divided into seven episodes, each of which provides

different activities to users. It gives students a tangible goal to accomplish through solving problems at each stage of the program: that goal is to restore different places on an island that is put under a magic spell by a wicked magician. The main characters of the program are Maru, John, and the magician. If Maru follows the instructions and gives the right answers to the questions, thus showing his understanding of English words or dialogues, he can rescue a place and move forward to another place. When questions or instructions are given, there appear three or four icons for possible choices of the answer. Whenever users put the cursor on the icons, the computer emits possible choices of the answer. Users are supposed to choose one of them. During the problem-solving activities, users can listen to questions or instructions repeatedly by clicking on the icons. They can repeatedly hear possible choices of the answer by putting the cursor on the icons for them.

The framework for tasks in each episode of the program is basically the same and can be summarized as follows:

(1) In the opening scene, users can practice and learn English words or short dialogues that are related to solving the problems by clicking on things or persons on the screen. Users can hear English words or dialogues repeatedly.

(2) If users click on the magician, the problems to be solved are provided. In each place on the island, two types of task activities are given. Usually the first is a main task and the second a reinforcing one that checks users learning of English words or phrases in the main task. If users give a wrong answer three times in the main task, they are taken back to the opening scene. If they give a wrong answer three times in the reinforcing task, they have to go back to the main task and perform it again.

(3) Users can also go to the section learning words and dialogues and learn the meanings or pronunciations of the words

and dialogues used in the task at hand.

The English words and phrases are presented with contextual support such as sound, graphics, and animation. Users have access to (1), (2), and (3) in a non-linear way. The summaries for the main content of one of the episodes are provided in Appendix A.

2.3. Data Collection

Data collection included the gathering of videotaped participant interactions at the computer, videotaped regular EFL classroom interaction which provided preliminary information about the fourth grade EFL class, fieldnotes of informal oral interviews with the Computer English Class teachers, and fieldnotes of informal oral interviews with the participants which gave background information about them. The school allowed the researcher to collect data during the end of the spring semester, only to the extent that she would not interrupt students regular schedule of school activities. So the researcher gathered data in a quasi-experimental setting, that is, not in an EFL classroom setting, but in a computer lab situation where only the participants worked on the program. Each pair of students had the opportunity to work on the program twice. Table 2 summarizes the amount of time each dyad spent working on the software program per session.

Table 2

Amount of time each dyad spent working on the software program per session

	Pair A	Pair B	Pair C
Session 1	40 minutes	48 minutes	47 minutes
Session 2	37 minutes	50 minutes	43 minutes

The video camera was mounted on a tripod and placed

behind the pairs of the students while they were working on the program. While collecting data, the researcher took the role of a teacher, giving the students instructions on how to work together at the computer. She told them that they could talk to each other in Korean or in English, ask each other for help, and take turns in controlling the mouse. *Marus English Adventure* was new to all of them. To save time that might be spent on procedural matters, the researcher briefly explained to them the functions of icons on the introductory screen by showing them the booklet for the software. Several times the students asked her what they should do when they had technical difficulties in navigating the program. However, they did not seek help from her in relation to the content of the program, such as English words or sentences and their meanings.

As an observer, the researcher was present all the time they were working at the computer. Sometimes the researcher strolled around the workstations to make sure they were being videotaped properly. The researcher tried to make her presence unobtrusive.

2.4. Data Analysis Methods

The main analytical focus in this study is to examine the participants' talk engendered while they are solving the problems given by the software program. Discourse at the computer is highly context-dependent; the interactants make extensive use of deixis and thus their language is elliptical. The computer acts as one of the interactants and its involvement in the discourse is realized in various ways, that is, vocally (e.g., spoken instruction or feedback) and non-vocally (e.g., text written on the screen, change of the screen, animation or sound). Therefore, a detailed discourse analysis should be done to comprehend the talk among interactants around the computer.

To identify signaling and inferencing procedures used by the

participants in making situated interpretations of their talk and the strategies used to negotiate their social identities, I draw on Gumperz's (1982) notion of "contextualization cues" (p. 131). These cues are verbal and nonverbal signs which, when mapped onto message content, can be shown to be functional in the signaling of 'interpretive frames' (Goffman, 1974). The interpretive frames are what the interlocutors think they are doing when they talk to each other (e.g., joking, arguing, commending, scolding), in which hearers can infer what is going on. Among the contextualization cues are turn-taking with the mouse, clicking on things on the screen, eye gaze, gestures, body movements, head nods, discourse markers, laughter, and repetition.

At the same time, to capture the dynamics of interaction, I employ the concept of positioning which is developed by Davies and Harre (1990). Davies and Harre argue that "the concept of positioning helps focus attention on dynamic aspects of encounters in contrast to the way in which the use of role serves highlight static, formal and ritualistic aspect" (p. 43). They define "positioning as the discursive process whereby selves are located in conversation as observably and subjectively coherent participants in jointly produced story lines" (p. 48). There can be interactive positioning in which what one person says positions another. And there can be reflexive positioning in which one positions oneself. According to the positioning theory, the social relationship between interactants is established by virtue of their engaging in discourse practices. Thus the source of speaker's social identities is anchored in a moment-by-moment production of discourse. Based on this, the analysis of interaction in this paper will focus on the way in which each participant positions himself or herself and the other participant and also how each participant plays a role in creating situations for his or her own and the other's learning.

To this end, all the talk produced by the users and the computer was transcribed according to the conventions that are provided in Appendix B.

3. Analysis of Interaction

The focus of the investigation is on the children's role relationships while they are performing problem-solving tasks. In addition, certain social aspects of the interaction which were found in the discourse of the children such as responsibility, cooperation, motivation, and autonomy in learning are highlighted.

3.1. Dynamics of Role Relationships

Much of the data gathered in this study indicate that the roles of the participants are not static, being tied to a certain position, but rather dynamic, changing in the course of the interaction according to the situation at hand. The analysis of the interaction undertaken in the following excerpts illustrates how each interactant positions himself or herself and the other during task activities.

3.1.1. Responsibility in Learning Activities

Children's role relationships are discussed in terms of responsibility in performing task activities. Some data showed that the children's roles changed during the course of interactive work by either taking on responsibility or assigning it to the other. The excerpt considered here is taken from the first interaction between B1 and G1 (pair A). As mentioned in the Method section, B1 and G1 were also partners in the classroom. Judging from their experience in using the computer, B1 seemed to be more skilled than G1. However, with regard to English, it was unclear who was more proficient. Before analyzing the

interaction in Excerpt 1, I provide information about the interaction prior to the excerpt. B1 and G1 have already failed twice to complete the first task in the episode 'people in the mirror'. To do the job successfully, they had to know the names of John's family, their relationships, and their belongings. However, they did not get enough information about John's family members before they embarked on the problem-solving activity. In the situation where they did not have enough knowledge to do the activities, they attempted to avoid personal responsibility for providing the answer. B1 took the initiative by assigning the roles in performing the activities; he frequently placed G1 in a position where she had the responsibility of providing the right answers. At the same time, G1 tried to avoid this responsibility.

Realizing that they had to know about the family to do the task successfully, B1 and G1 began to learn the names of John's family members and their relationships in the opening scene of the episode. G1 divided the work of memorizing the names of John's family into two parts and assigned half of the work to B1; she told B1 that she would remember two of them and then he should remember the other two, apparently suggesting that both of them contribute to solving the problem, and B1 agreed with G1's suggestion. G1 not only took her own responsibility for performing activities, but also put B1 in a position where he had some responsibility. Thus, she took the initiative role in leading the activities, although she took the position of not being able to do all the task activities by herself. Accordingly, both G1 and B1 had their own role in solving the problems and in finding out the names of John's family members. In the following excerpt, they are in the middle of solving the problem. B1 is controlling the mouse.

Excerpt 1

1. C: Magician: Who is this?
2. C: Sister: My name is Mary.
The handbag is mine.
3. B1: Mary? (B1 and G1 look at each other)
4. B1: 여자 애, Mary지? (B1 talks to G1 with his eyes
{the girl, isn't it Mary?} wide open)
5. B1: 여자 애, Mary잖아. (G1 just stares at B1)
{The girl, it's Mary.}
6. C: It's John's [father. (B1 leans his body toward the
computer and puts the cursor
on the icon)
7. G1: [너가 기억하기로 (looks at B1)
했잖아!
{You're supposed to remember that!}
8. G1: Father 아니야. (B1 puts the cursor on a choice)
{It's not Father.}
9. C: It's John's mother.
10. G1: Mother 아니야. (B1 puts the cursor on a choice)
{It's not Mother.}
11. C: It's John's brother. (B1 puts the cursor on a choice)
12. C: It's John's sister.
13. G1: 둘 중의 하나야. (points to the screen)
{It is one of the two.}
14. B1: 애지? (still placing the cursor on the
{Isn't it this one?} choice for 'sister')
(moves the cursor to the choice
for 'sister' again)
15. C: [It's John's sister.
16. B1:[애야. 그지? (looks at G1)
{This one, right?}
17. G1: 해 봐. 아니면 어떡해! (looks at B1)

{Try it. What if it's not!}

18. B1: 맞지?

{Right?}

(B1 clicks on the icon for 'sister')

19. C: Magician: 흥, 맞았군. 제법인데.(B1 looks at G1 with a smile)

{Correct, doing pretty well.}

20. G1: 흥, 맞았군. 제법인데. (imitates the magician's tone

{Correct, doing pretty well.} of voice)

In this segment of the interaction, we can see that B1 actively participates in finding out the answer. At first, listening to the character Mary talk about herself, he repeats 'Mary?' with a rising intonation, which seems to display his effort to figure out who the person is (line 3). Then, he asks G1 if the girl is Mary (line 4). Although he asserts that the girl is 'Mary' (line 5), he is not sure of the answer (line 6). At this point, G1, looking at B1, complains about his lack of confidence in choosing the correct answer by reminding him of his responsibility to remember the person at hand (line 7). Here, G1 takes the position of blaming B1 for his incapability of providing the answer, since the task to remember John's sister, 'Mary', had been assigned to B1 earlier in the interaction. G1 helps B1 in figuring out the answer by asserting that both 'father' and 'mother' are not the answers, thus narrowing down the possible choices for the answer (lines 8 and 10). However, through saying that either 'brother' or 'sister' is the answer, G1 puts herself into the position of not being sure about the right answer either (line 13 and 17)).

Although G1 helped B1 provide the right answer by narrowing down the possible choices, it is B1 who initiated G1's help by seeking her confirmation about his own choice and he eventually chose the correct answer 'sister'. Through the magician's feedback (line 19), B1 is positioned as the one who is doing the task well. G1 also positions B1 as the one who is doing the work well by repeating the magician's utterance while

imitating the magician's voice as well (line 20). The interaction continues.

21. C: Magician: What's her name?
(B1 puts the cursor on a choice)
22. C: Her name is Susie.
(B1 puts the cursor on a choice)
23. C: [Her name is Lisa.
24. G1: [아까 여기서 틀렸어. (points to the screen)
{We were wrong right here a moment ago.}
(B1 puts the cursor on a choice)
25. C: Her name is Mary.
(B1 puts the cursor on a choice)
26. C: Her name is Ann.
27. B1: Mary야 그지? (looks at G1)
{It's Mary, isn't it?}
28. G1: 응. (with a small voice)
{Yeah}
(B1 puts the cursor on a choice for 'Mary')
29. C: Her name is Mary. (B1 clicks on the icon for 'Mary')
30. C: Magician:맞았군, 이럴 수가! (B1 and G1 look at each other
{Correct, how come!} with a big smile)
31. B1: 이번엔 잘 풀리겠다.
{This time, things will be pretty good.}

The magician is again asking for the name of John's sister, which B1 had the responsibility to remember. (line 21). G1 shows her recall of what was wrong in the previous trial of solving the problems (line 24). B1 keeps placing the cursor on one after another of the icons. Although B1 continues depending on G1 to choose the answer by seeking her confirmation (line 27), G1's help is initiated by B1's active questions as is shown in the previous interaction and this interaction as well. After

choosing the correct answer, B1 shows confidence in doing the rest of the work (line 31). One thing to note here is that B1 did not try to avoid the responsibility of providing the answer, but carried out his assignment of remembering the name of 'Mary' successfully. In this case, he takes the position of being responsibly involved in solving the problems. They continue the activity:

32. C: Magician: Who is this? (B1 and G1 look at each other.
G1 turns her ear toward the computer)
33. C: Brother: My name is Peter.
The shoes are mine.
34. B1: 누구냐?
{Who's this?}
(B1 puts the cursor on a choice)
35. C: It's John's sister.
36. G1: Brother 해 봐. (points to the screen)
{Try 'brother'.} (B1 puts the cursor on a choice)
37. C: It's John's brother.
38. B1: Brother?
(B1 puts the cursor on the
choice for 'brother' again)
39. C: It's John's brother.
40. G1: 응, 해 봐. (nods her head)
{Yeah, try it.} (B1 clicks on the choice for 'brother')
41. C: Magician: 운이 좋은 녀석이군.
{You are a lucky kid.}
42. G1: 그래, 우린 운이 좋다, 왜? (talks to the magician)
{Right, we're lucky, so what?}

Remembering information about John's brother was G1's responsibility. G1 shows engagement in the activity by turning her ear toward the computer. B1 positions G1 as the one who is

responsible for providing the answer (line 34). By suggesting an answer (line 36), G1 takes the lead in completing the activity. B1 repeats 'brother' with a rising intonation, seeking G1's confirmation (line 38). There is no response from G1. Then, B1 puts the cursor on the icon for 'brother' again. Finally, G1 tells B1 to try the choice while nodding her head (line 40). By asserting that G1 succeeded in providing the right answer due to her good luck, the magician positions her as the one who is just lucky enough to do the work. G1 displays her discontent with the magician's positioning by talking back to him '그래, 우린 운이 좋다, 왜?' [Right, we're lucky, so what?] (line 42). Here, although it is G1 who provides the right answer, she attributes the success in providing the right answer to both herself and B1 by saying 'we' instead of 'I'. As a result, she displays solidarity with B1 and reveals her acknowledgment that it is both of them who are performing the task.

In sum, the role relationships between G1 and B1 were addressed in terms of their capability of performing task activities and taking responsibility for them. As for capability, it appeared at first that G1 played the role of resource upon which B1 relied to solve the problems. B1 positioned G1 as the one who was more capable of doing the tasks and who was responsible for it. G1 sometimes accepted B1's positioning of her, but when the task was beyond her ability, she gave up the position of a more capable interactant. In relation to the responsibility for performing task activities, both B1 and G1 tried to avoid the responsibility at the onset of working on the first task in the episode 'people in the mirror'. However, by dividing the responsibility for solving the problems, G1 established a new working relationship with B1. She took one part and assigned the other to B1. In that way, both of them were expected to act as responsible interactants in the tasks assigned to each of them. As a result, B1 took the position of a leader in solving the

problems which were assigned to him, although he continued seeking G1's confirmation. When the tasks were not the ones assigned to her, G1 positioned herself as the one who could not provide answers. On the other hand, she regained her position as a resource for the tasks, when they were in her own sphere of responsibility. Here we see that B1 and G1's role relationships were realized through responsibilities for the task at hand.

3.1.2. Cooperation

The children in this study supported each other's efforts to solve the problems in a verbal and nonverbal way. Accordingly, their cooperative attitudes toward each other were exhibited through their discourse and actions, which were dynamically interwoven during their interactive work on solving problems. Through the cooperative work, their roles in performing activities became complementary.

The examples to consider here are taken from the second interaction between B2 and G2 (pair C). Judging from their background, it can be said that B2 was more experienced in English and the use of computers. When we first look at their interaction, it is apparent that B2 took the position of initiator by leading the activities; he played a main role in providing answers for problems, he made use of English expressions while interacting, and took control of the mouse more often. However, G2 showed her involvement in the activities by claiming her turns with the mouse, by trying to repeat the utterances emanating from the computer just like B2 did, and by showing reaction to the performance of the activities through simple English exclamations such as 'Yeah, Oh no, Oh my God, O. K.'.

The analysis of the following excerpt demonstrates that both B4 and G2 made contributions via verbal cooperation. B2 and G2 have begun to do the second task given in the episode 'a park that has lost its color'. The magician has assigned the task which

is to paint the things in the park with their matching colors. This is done by clicking on one of the colors given in the palette and then clicking on one of the things in the park.

Excerpt 2

1. B2: It's a blue. (clicks on the color of blue)
2. G2: 새. (points to the screen)
{Bird.}
3. B2: It's a [blue bird. (clicks on the bird)
4. G2: [Bird, bird. (the bird gets painted)
5. C: Bird: oh, thank you, Maru.
6. B2: Red. (clicks on the red color)
7. B2: Red, (with rising tone)
8. G2: Red, 장미. 장미, 장미.
{Rose. Rose, rose.}
9. B2: Red [rose. (clicks on the rose)
10. G2: [Red [rose. (the rose gets painted)
11. C: Rose: [Oh, thank you, Maru.
12. B2: Purple. (clicks on the color purple)
13. B2: Purple flower (clicks on the flower)
(the flower gets painted)
14. G2: [Purple flower.
15. C: Flower: [Oh, thank you, Maru.
16. B2: Orange. (clicks on the color orange)
17. G2: Tulip. (points to the screen)
18. B2: Orange [tulip. (clicks on the tulip)
19. G2: [Tulip (the tulip gets painted)
20. C: Tulip: Oh, thank you, Maru.

Right after B2's uttering 'It's a blue', G2 selects a matching entity in the park for the color by uttering '새' {bird.}. In that way, she contributes to completing B2's utterance by filling in the word 'bird' in Korean. Then, clicking on the bird, B4 utters

the whole sentence 'It's a blue bird' (line 3). Meanwhile, following B2's utterance of 'It's a' and overlapping 'blue bird', G2 utters 'Bird, bird' (line 4). Her repetitive utterance of 'bird' signals that she has thought of the English word 'bird'. In this exchange, we see B2 and G2's verbal cooperation while doing the task. Furthermore, it is done through layers of discourse which show B2 and G2's dynamic positioning of their roles in performing the task; first B2 takes the position of initiator by uttering 'It's a blue' (line 1), then G2 positions herself as the one who knows the matching entity by providing the missing part of B2's utterance '새' {bird} (line 2). Then, B4 completes the sentence by saying 'It's a blue bird' (line 3). At the same time, G2 shifts her previous Korean utterance of '새' {bird} to English (line 4). Thereby, she assumes the position of one who can provide the word 'bird' in English, just as B2 can.

B2 initiates another interaction; clicking on the red color, he utters 'red' and then repeats it with a rising tone (line 7), which seems to signal that he is figuring out the matching entity for the color of red. Immediately after the repetition of 'red', G2 takes the initiative in providing the matching entity for the color by means of uttering the word 'rose' in Korean. In this way, she fills in the word '장미' {rose} after B2's 'red' and contributes to completing the phrase 'Red rose', which is uttered by B2 in the following utterance (line 9). Overlapping B2's 'rose', G2 repeats 'Red rose' showing her involvement. In this discourse, we can see that B2 and G2's role relationships were established through a moment-by-moment cooperative exchange of words which led to forming the whole phrase and finishing the task.

B2 continues taking the initiative in doing the task by clicking on the color orange and uttering 'Orange' (line 16). Soon, pointing to the screen, G2 utters 'Tulip' (line 17). Here, by providing the matching word for the color orange, she assumes the position of the one who contributes to the activity. This

segment of interaction also demonstrates that G2 and B2's cooperative role relationships in doing the task are set up by their dynamic exchange of the words 'orange' and 'tulip'. After G2 provides 'tulip', clicking on the tulip, B2 repeats 'Orange tulip' which was started by himself and completed by G2 (line 18). The interaction continues:

21. G2: Tree.
22. B2: Green. (clicks on the color green)
23. B2: [Green tree. (clicks on the tree)
24. G2: [Green tree.
25. C: Tree: Oh, thank you, Maru.
26. B2: Gra[y. (clicks on the color gray)
27. G2: [Gray.
28. B2: Gra[y rock. (clicks on the rock)
29. G2: [Gray rock.
30. C: Rock: Oh, thank you, Maru.
31. B2: Yell[ow. (clicks on the color yellow)
32. G2: [Yellow.
33. B2: [Yellow, (clicks on the sunflower)
34. G2: [Yellow,
35. B2: [Sunflower.
36. G2: [Sunflower.
37. C: Sunflower: [Oh, thank you, Maru.

Unlike in the previous actions, this time, G2 is initiating the task by uttering 'tree' (line 21). B2 provides the matching color for 'tree' by uttering 'green' while clicking on the color (line 22). In that way, G2 and B2's verbal cooperation forms the phrase 'green tree'. Furthermore, in this segment of the interaction, the change of their role relationships in terms of the initiation of the interaction is displayed. After 'tree' and 'green' are uttered by G2 and B2 respectively, B2 and G2 simultaneously utter the

complete phrase, 'Green tree', which was initiated by G2 and finished by B2.

However, B2 regains his position as an initiator and a leader by saying 'gray' and clicking on the color gray (line 26 and 28). B2 again initiates the interaction by clicking on the color yellow and uttering 'yellow' (line 31). Almost simultaneously, G2 also utters 'Yellow' showing her involvement. Then, while B2 is clicking on the sunflower, B2 and G2 utter 'yellow' and then 'sunflower' in chorus (lines 33, 34, 35 and 36). Their simultaneous uttering of 'yellow sunflower' positions them as co-participants in the activity. It is notable here that B2 and G2's role relationship as co-participants was established through verbal cooperation primarily in English. Finally B2 and G2 solve all the problems in the episode.

In the analysis of the above excerpt, we saw that B2's role as an initiator in doing the task was not constant but variable. More importantly, it was revealed that their roles in performing the task activities became complementary since both of them contributed to solving the problems by means of verbal cooperation.

3.2. Construction of a Context for Learning

There were instances of peer teaching and motivated learning in the course of the children's interactive work. The analysis of the discourse undertaken in this section reveals that the context for learning such as getting help or explanations is jointly constructed by both of the interactants.

3.2.1. Peer Teaching

When a more knowledgeable interactant gives help or explanations to his or her partner, the less knowledgeable interactant as well as the more knowledgeable one plays an important role in establishing the situational context for help or

explanations.

The following excerpt taken from the first interaction between B1 and G1 (pair A) illustrates the dynamic construction of learning situations. B1 and G1 have failed to complete the first task in the episode, 'people in the mirror'. So the opening scene for the episode appeared on the screen again. John's family members are shown in the mirror. B1 and G1 are motivated to listen carefully to the conversations of the family members with John and Maru, since, through their previous experiences of doing the same task, they realized the importance of the names of John's family and their relationships in order to solve the problems. The excerpt begins just after B1 clicks on John's mother 'Ann'. Thus, the conversation among John's mother, John, and Maru begins to be heard.

Excerpt 3

1. C: Mother: Oh, my son, are you okay?
Who's that?
2. B1: That? (looks at G1)
3. G1: [Who's that? (looks at B1 and then points to
애가 누구네. the screen)
{It says who's that person.}]
4. C: John: [Mom, that's my new friend.
Maru: My name is Maru.
What's your name?
Mother: My name is Ann Brown.
5. G1: [Ann Brown. (G1 and B1 look at each other)
6. B1: [Ann Brown.
7. C: Mother: Nice to meet you, Maru.
8. B1: Nice to meet you, Brown? (looks at G1 with his eyes
widening in surprise)
9. C: Maru: Nice to meet you.
10. G1: 아니, Brown은 형이고, (looks at B1, touches his

Ann은 이름이잖아. shoulder with her hand,
 여기서는 이렇게 이름하고 then points to the screen,
 성이 뒤바뀌잖아, and again looks at B1)
 미국에서는.

{No, Brown is the last name and Ann is her
 first name. Here, like this, the order of last
 and first name is different, in America.}

11. B1: 아아, 아휴.

{Ahah, ahyu.}

Because of B1's gaze on her and his repetition of 'that' with a rising intonation (line 2), G1 seems to think that B1 is asking for an explanation. On the assumption that B1 does not understand the mother's utterance, she provides the mother's full utterance along with its Korean translation (line 3). It is noteworthy that G1's explanation is initiated by B1's repetition of 'that?' with a rising intonation.

Then, the dialogue continues (line 4). G1 and B1's repetition (line 5 and 6) appears to display their effort to memorize the name in order to make use of it in the subsequent problem-solving activities. Then, the mother's greeting is heard; 'Nice to meet you, Maru'. B1 repeats it by adding a rising intonation and replacing Maru by Brown; 'Nice to meet you, Brown?' (line 8). Here he replies, even before the character Maru does, thus displaying his capability of replying to the greeting. However, at the same time, he reveals his uncertainty about the name of the mother by uttering 'Brown' instead of 'Ann' with a rising intonation and looking at G1 with an inquisitive gaze.

In response to B1's rising intonation of 'Brown' and his facial expression, G1 tells him that 'Brown' is the family name and 'Ann' is the first name. Then she continues to explain about the difference between English and Korean in the order of the first and family name (line 10). B1 signals that he now understands

the order of English names by uttering ‘아아’ {Ahah} and then shows that he is relieved from the anxiety caused by the uncertainty about the mother’s name by uttering ‘아휴’ {ahyu} (line 11). Here again, G1’s explanation is elicited by B1’s active involvement in finding out the name of the mother.

In the analysis of this excerpt, it is shown that the less knowledgeable interactant, B1, played a crucial role in eliciting the explanations from the more knowledgeable one, G1, by means of repeating the utterances heard with a rising intonation and thus signaling for G1’s help (lines 2 and 8). Therefore, we can say that the learning activities in this interaction were executed in a multi-directional way, since the construction of the teaching and learning context was done by both B1 and G1.

Excerpt 4 is taken from the second interaction between G3 and G4 (pair B). The excerpt shows that G4 helped G3 understand the meanings of ‘right’ and ‘left’ in the episode ‘a strange street’. Before the analysis of Excerpt 4, I briefly describe the interaction that occurred just before the excerpt begins. After failing to find ways to get out of the maze by following John’s instructions, G3 and G4 practiced the words ‘right’, ‘left’ and ‘straight’ in the section ‘learning words and dialogues’. Then they went back to the problem-solving activity in the maze.

The following interaction in the next excerpt shows that G4 and G3 have learned the meaning of the words through their previous experiences of trial and error in following the instructions of ‘Turn right’, ‘Turn left’, and ‘Go straight’. The excerpt begins with Maru’s asking for help to get out of the maze. He is in the middle of a four-way intersection. G3 is holding the mouse.

Excerpt 4

1. C : Maru: 처음으로 돌아 왔군.

{I am back to the beginning.}

2. C : Maru: John, [다시 가르쳐 줘.
{Tell me again.}
3. G3: [이쪽 위가 뭐지? (looks at G4)
{What is this way upward?}
4. C : John: Turn right.

(G3 puts the cursor on the
arrow for 'straight')
5. G4: 아냐, 아냐.
{No, no.}
6. G4: 아냐! (G3 clicks on the arrow)
{No!}
7. C : Dong! Dong! Dong!
8. G4: 아니래니깐! (shaking her clenched fist, G4
{I told you 'No'!} looks at G3. G3 looks at G4)
9. G4: Turn right는 여기야, (points to the arrow for 'right')
여기, 여기, 여기.
{'Turn right' is here, here, here, here, here.} (G3 clicks on the one G4
pointed out)
10. C : John: Excellent.
11. G4: 저봐. (looks at G3)
{See?}
12. G4: Right가 여기고, (points to the right side of her
{'Right' is here.} with her hand)
13. G4: 여기, (points to her left side with her
{Here,} hand)
14. G3: Left. (looks at G4)
15. G4: Left.
16. G3: 그 다음에,
{Then, the next,}
17. G3: Straight. (points to the arrow with the
cursor and says 'straight', but
pronounces it poorly)

Despite G4's objection, G3 clicks on her own choice. The computer signals the answer is wrong and G3 is positioned as the one who does not know the meaning of 'right'. G4 blames for the wrong answer (line 8). Then, G4 points to an arrow, uttering 'Turn right 는 여기야, 여기, 여기, 여기.' {'Turn right' is here, here, here, here.} (line 9). G3 clicks on the arrow G4 claims is the correct answer and John gives feedback by saying aloud, 'Excellent'. At last, G4 gains her position as the leader in solving the problem.

After telling G3 that she was right in figuring out the direction, G4 starts teaching G3 the meaning of 'right' and 'left'. She teaches G3 by pointing to her right side and uttering 'right 가 여기고,' {'Right' is here,} (line 12). Then, she initiates telling the meaning of 'left' by saying '여기.' {Here.} and pointing to her left side (line 13). Immediately after G4's initiation, in advance of G4's utterance of 'left', G3 provides the word 'left' while looking at G4, thus displaying her knowledge about the word 'left' (line 14). At this point, G3 takes the initiative by providing the word 'straight', though poorly pronounced, pointing to one of the arrows with the cursor of the mouse (lines 16 and 17). Finally, they understand the meanings of English words 'right', 'left', and 'straight'.

Through the analysis of the above excerpt, it is demonstrated that the construction of the learning situation was created as a result of G3's trial and error during the problem-solving. G3's learning situation for the meaning of 'right' was constructed not only by G4's initiation of explaining its meaning but also G3's failure to figure out the answer 'right'. Moreover, G3 did not remain a less knowledgeable interactant by waiting for G4 to finish the explanation of the word of 'left'. Instead, she uttered the word 'left' ahead of G4, immediately after G4 described its meaning with the pointing. Thus, she resisted being positioned as a passive learner. Then, she changed her position from a

help-receiver to the one who knows the words, left and straight. Even in this short exchange of discourse, we can see that G3 and G4's role relationship was not stable, but dynamically changed.

3.2.2. Motivation and Autonomy in Learning

When the children of this study faced difficulties providing right answers, they were often motivated to learn the words and dialogues related to solving the problems at hand. The children themselves diagnosed their weak points through trial and error while performing tasks and then made a decision to learn further. So it can be said that their learning activity reflected autonomy, since it was the learners who decided whether, what, and when to learn. Moreover, the motivated learning activity was dynamically engendered by both of the learners as in peer teaching.

The following excerpt taken from the second interaction between B1 and G1 (pair A) illustrates that motivation for learning was built through failures to provide correct answers. B1 and G1 are in the middle of working on the second task in the episode 'a strange street', which is to click on the icons for each part of the magician's body, following his instructions. They have already failed to provide correct answers twice. If they fail one more time, they have to go back to the first task in the maze again. B1 is taking hold of the mouse.

Excerpt 5

1. C: Magician: Touch my arm.
2. B1: 어?
{Uh?}
3. G1: Ar.
4. G1: [눈!
 {Eye!}

5. C: Magician: [Touch my arm. (B1 clicks on the magician to hear the instruction again)
(B1 clicks on the icon for 'eye')
6. C: Dong! (the computer signals the answer is wrong. G1 and B1 look at each other)
7. C : Magician: 잘 가거라, 가소로운 꼬마 녀석.
{Farewell, you little kid.}
(the screen begins to change to the previous activity in the maze)
8. G1: Ar이 뭐야? (looks at B1)
{What is 'ar'?
9. B1: 단어 공부를 더 잘 해야되.
{We should study words harder.}
10. G1: 단어 공부! (looks at B1 and laughs)
{Word study!}
11. B1: 아. (lowers his head and touches his face with his hand)
{Ah}
12. G1: 어렵다, 갈수록.
{It's getting harder}

B1 signals that he did not absorb the magician's instruction, saying '어?' (Uh?) (line 2). G1's imperfect repetition of 'arm' also shows that she is not sure of the word, either (line 3). They failed to provide the correct answer. As a result, the screen begins to change to the previous task in the maze. G1, who has been playing the main role in choosing the correct answers, loses her position as the leader in providing the answer. Here, she positions herself as the one who needs help; looking at B1, G1 asks what 'Ar' is (line 8). It becomes clear that she does not know the word 'arm'.

B1, unable to answer G1, suggests that they should study words harder (line 9), thus positioning himself as an initiator for learning words. G1 agrees with B1 by repeating his utterance '단

어 공부!' {Word study!} (line 10). Finding out that they cannot do the task without learning the words related to the parts of the body, B1 and G1 show motivation for learning. B1 shows frustration (line 11). G1 explicitly reveals that she discovered the limitations in her knowledge of English vocabulary and lost confidence in doing the task (line 12). The scene of the maze appears on the screen. The task continues:

13. B1: 아, 가소로운 것! (imitates the words of the
{Ah, you're ridiculous!} magician)
14. G1: 하하하하. (laughs and looks at B1)
{Ha ha ha ha.}
15. C: Maru: 처음으로 돌아왔군.
{I'm back to the beginning}
John, 다시 가르켜 줘.
{Tell me again.}
16. C: John: Turn left.
17. G1: 왼쪽.
{Left.}
18. B1: 필요없어. (B1 clicks on the icon for
{We don't need it.} 'learning words and dialogues')
19. G1: [필요없어? (looks at B1)
{We don't need it?}
20. B1: [아, 완전히 가소로운 것이네.(lowers his head and puts his
{Ah, he is really ridiculous.} hand on his face)
21. B1: 어떻게 가면 갈수록 (takes a look at the clock in
가소로워지나? the back)
{How come he is getting
more ridiculous?}
- (the screen changes to the mode
of 'learning words and dialogues')
22. G1: 더 어려워지고. (rubs her eyes)
{It's getting harder.}

The task in the maze begins to be provided (in 16). G1's attempt to provide the answer is stopped by B1, who clicks on the icon for 'learning words and dialogues' (line 18). In the interaction of lines from 1 to 22, it is shown that both G1 and B1, through discovering their limitations in English vocabulary, are becoming motivated to practice words, and that this decision is theirs. In particular, B1 takes the initiative in the practice activity by asserting that they need to study harder (line 9) and by going to the section for 'learning words and dialogues', while G1 explicitly positions herself as the one who is losing confidence in figuring out the words (lines 12 and 22). The screen changes to the mode of 'learning words'.

(B1 clicks on a word)

23. C: Hair.

24. B1: Hair.

(B1 clicks on a word)

25. C: Ear.

26. B1: [Ear.

27. G1: [Ear.

(B1 clicks on a word)

28. C: Mouth.

29. B1: [Mouth.

30. G1: [Mouth.

(B1 clicks on a word)

31. C : Shoulder

32. B1: [Shoulder.

33. G1: [Shoulder.

(B1 clicks on a word)

34. C: Arm.

35. B1: [Arm.

36. G1: [Arm.

37. G1: 팔이였어!

{It was 'arm'!}

38. G1: Arm.

While practicing the words one by one, B1 clicks on the word 'arm' which they failed to figure out and then B1 and G1 repeat 'arm' in chorus. Immediately after the repetition, G1 utters '팔이 였어!' {It was 'arm'!} showing her realization of the meaning of the word (line 37). In this utterance of G1's, her learning of the word 'arm' is revealed. Then she repeats 'arm' once again as if she is making sure of learning the word (line 38). Here, it can be said that G1's learning took place because B1 led her to the section for 'learning words and dialogues'.

In excerpt 5, we see that both B1 and G1 were motivated to learn the word 'arm'; although the learning of the word took place by B1's suggestion (line 9), it may be said that his motivation was stimulated by the failure to provide the correct answer and G1's question about the meaning of 'arm' (line 8). That is, since B1 could not provide the answer to G1's question, he suggested a way of solving the problem by saying that they should study words harder (line 9). G1's acknowledgement of the need for learning words also contributed to their learning of the word 'arm' (line 10). Therefore, it can be said that the context for learning the word 'arm' was established by layers of interactive work between B1 and G1.

Furthermore, the autonomy of the learning activity is well illustrated in this interaction. Not only B1 but also G1 independently chose to learn the word; when B1 suggested they learn the word, G1 also provided a reason why they had to learn the words in the section for 'learning words' by saying that the words were getting harder (lines 12 and 22). Thereby, G1 showed that she also wanted to learn the words, indicating that she was not passively following B1's suggestion. One last thing to note is that B1 and G1's role relationship in terms of

providing the answers and initiating the activity of learning words was not static, but variable and situated in the course of interaction; G1 took the position of initiator in providing answers for the questions, while B1 took the position of leader in learning the words they did not understand.

Some children, before embarking on performing the tasks, often prepared for it by practicing the words related to the problems on their own initiative. The following excerpt from the first interaction between G3 and G4 (pair B) shows that the practicing of English words was co-constructed on their own initiative and that their roles in creating a learning context were not fixed, but changed throughout the discursive processes. G3 and G4 have succeeded in performing the first task in the episode 'a stolen store'. Then the magician has given the second task in which users have to get the stolen items back to the people in the store. On the lower right corner of the screen, the icons for the items have appeared. G3 is holding the mouse.

Excerpt 6

1. G4: 이거 (xxxx) (points to the icons for the things)
{This}
2. G4: 야, 이거 물건인데 (points to the icons for the things)
이거 다 어떻게 해!
{Hey, these are the things, what do we have to do with all these!}
3. G3: A B C 해 볼까?
{Shall we do 'A B C'?
4. G4: 해봐.
{Try it.} (G3 clicks on the icon for 'learning words and dialogues')
(the screen begins to change)
5. G3: 빵이 bread 아냐?
{Doesn't bread mean 'bread'?'} (the section for learning words

- is provided on the screen)
6. G4: 맞을거야.
{It may be right.}
7. G4: 여기다.
{Here} (points to the arrow icon for turning the page)
(G3 clicks on the arrow icon)
(the page they need is provided on the screen)
8. G3: 돈, [money.
{Money}
9. G4: [돈, money.
{Money} (G3 clicks on a word)
10. C: Paper money.
11. G3: Paper money가 뭐야?
{What is 'paper money'?) (G3 clicks on a word)
12. C: Money.
13. G3: [Money.
14. G4: [Money.
(G3 clicks on a word)
15. C: Fan.
16. G3: [Fan.
17. G4: [Fan.

G4 positions herself as the one who does not have confidence in doing the task at hand by worrying about what to do with the items (line 2). Then, G3 provides a way to do the task by suggesting that they go to the section for 'learning words and dialogues' (line 3) and G4 agrees with G3's suggestion (line 4). Here we see how a learning context was created. It was established through three layers of interaction: G4's display of lack of confidence (line 2), G3's suggestion to learn words (line 3), and G4's agreement (line 4). In effect, both G3 and G4 contributed to a decision to study the words. They showed both

motivation and autonomy in learning. The section for 'learning words' is provided. G3 clicks on the word and G3 and G4 repeat it after the computer in chorus (lines 12, 13, 16 and 17). In the same way, they continue practicing the words:

8. G3: Bread.

(G3 clicks on a word)

19. C: Bread.

20. G3: [Bread.

21. G4: [Bread.

22. G3: Coat.

(G3 clicks on a word)

23. C: Coat.

24. G3: [Coat.

25. G4: [Coat

(G3 clicks on a word)

26. C: Water.

27. G3: [Water.

28. G4: [Water.

(G3 clicks on a word)

29. C: Be[d

30. G3: [Bed

31. G4: Bed.

32. G4: 다 알았어.

{I have learned all.}

33. G4: 근데, 부채 다시 한 번 (points to the fan)

해보자.

{But, let's study 'fan' again.} (G3 clicks on a word)

34. C: Fan.

35. G3: [Fan.

36. G4: [Fan.

This time, before clicking on the words, G3 reads aloud

'bread' and 'coat', thus showing her knowledge of those words (lines 18 and 22). As for the next word 'water', G3 does not read it aloud before listening to the computer's read-aloud as she did with the previous two words, 'bread' and 'coat'. After practicing the word 'bed', G4 begins to show her confidence (line 32). However, soon, she changes her position from the one who knows all the words to the one who is not sure of the word 'fan' by suggesting that they practice the word 'fan' once more (line 33). Here, G4 herself constructed a situation for learning the word 'fan'. G3's cooperation by clicking on the word also made it possible for G4 to practice the word 'fan'. The interaction continues:

37. G3: [이거는. (points to the word 'bed' with
 {This one} the cursor of the mouse)
38. G4: [이거는.
 {This one}
39. G3: [Bed.
40. G4: [Bed
41. G3: 그[다음에, (points to the word 'bed' with
 {Then the next} the cursor of the mouse)
42. G4: [그다음에,
 {Then the next,}
43. G3: [Coat.
44. G4: [Coat.
45. G3: [이거는, (points to the word 'bed' with
 {This one,} the cursor of the mouse)
46. G4: [이거는,
 {This one,}
47. G4: Water.
48. G3: Wa,
49. G4: Water.
50. G3: Wa,

G3 and G4 made the decision to learn English words when they needed to and that they were actively engaged in not only practicing the words but also reinforcing their learning through repetition. So the fact that they had motivation and autonomy in their own learning is well illustrated. As for the roles of G3 and G4 in the learning activity, both of them contributed to generating situations for their own or the other's learning. Accordingly, their role relationships in terms of construction of context for learning varied as the interaction progressed.

4. Implications and Conclusions

In this study we have discussed the social dimensions of EFL learning children's interaction at the computer, focusing on the dynamics of their role relationships. Children's responsibility, cooperation, peer teaching, motivation and autonomy in learning were highlighted. In particular, some students divided the responsibility for solving the problems, establishing their own working relationships, and thus both of them acted as responsible interactants in the tasks assigned to each of them. Some students supported each other's effort to solve the problems and, through cooperative work, their roles in performing task activities became complementary. On the other hand, there were instances of peer teaching and motivated learning. The analysis reveals that the context for learning such as getting help or explanations was jointly established by both of the students. The less knowledgeable student played a crucial role in eliciting the explanations from the more knowledgeable one and the position as a less or more knowledgeable interactant was not stable, but changed throughout the problem-solving task activities. The construction of context for the motivated learning was also often built by layers of interactive work between the students and through the failures to provide correct answers. In

addition, the students showed autonomy in their learning activity by diagnosing their weak points through trial and error and then making a decision to learn further by themselves. Even when one of them suggested practicing words, the other also provided a reason for learning the words. They did not passively follow the other's suggestion for learning; rather they actively made a choice.

Besides these social characteristics, some other social aspects were found in the discourse of the children. Some children showed appreciation of their efforts after they accomplished the tasks and encouraged each other to try his or her best. Sometimes, they acknowledged his or her own and the other's mistake and subsequently provided comfort for each other and cared about their partner's involvement in the activities. Through working together on a foreign language software program at the computer, they could learn important social skills along with learning a language. Children's response at the exit interview reveals that all the children in this study enjoyed working on the EFL learning software program, in particular, with a partner. They stated that they liked the software program and preferred working together with a partner to working alone. Some students mentioned that if it had not been for their partners, they could not have completed the problem-solving tasks.

Working in dyads or in small groups is not a common practice in schools in Korea, even though it is recently being encouraged. According to the interviews with the Computer English class teachers, it is said that parents prefer their children to work alone at the computer rather than with other students. This is probably because they are not sure of the value of pair work at the computer. With regard to the teaching of English in primary schools in Korea, the teaching method is still largely teacher-centered and students' attitudes are competitive. However, the new 7th EFL curriculum focuses on helping

students keep their motivation and interest in English learning in secondary schools. Therefore, its guidelines encourage teachers to use various activities, games, and audio-visual materials. It also aims to make children actively involved in their learning process.

The findings of this study suggest that both students in a dyad had their own place in performing task activities, contributing to solving problems and getting benefits from peer interaction. The social characteristics found in this study such as responsibility, cooperation, peer teaching, motivation, and autonomy in learning are in accordance with guidelines in the EFL curriculum for primary schools. Moreover, these social aspects inform us that working together on an EFL software program can help create an environment that allows learners to take an active role in their learning process, fulfilling recent educational demands such as a more student-centered, individualized, warm and cooperative learning opportunities.

However, the setting in which data were gathered does not reflect the natural EFL class. Only a limited number of students were involved in this study. With regard to the computer program, among various kinds of software available for primary school children's EFL learning, only one program was used for the present study. Therefore, we cannot easily generalize the findings from the analysis in this study to other cases of peer interaction at the computer.

Despite these limitations, this study may help educational practitioners and parents understand the dynamics of small group work at the computer by providing an insight about the interactive process and the possible benefits of peer interaction. It also suggests one way of looking at peer interaction around the computer and organizing EFL instruction using the computer in primary schools.

For further research it is recommended to investigate interactant variables that may influence the nature and quality of

interactions between students around the computer. Some second language interaction research (e.g., Kasanga, 1996) claims that certain characteristics of the members in a dyad have an effect on interactional behaviors. Thus, in particular, it is suggested that research be conducted by pairing students according to their gender, their English proficiency level, their experience in using the computer, and the quality of their friendship.

To conclude, the various pedagogical implications mentioned earlier and the children's positive reactions suggest that pair work around the computer has the potential to be a meaningful and enjoyable environment for primary school children's EFL learning activities.

References

- Abraham, R. and H. Liou. 1991. Interactions generated by three computer programs: analysis of functions of spoken language. In P. Dunkel, ed., *Computer-Assisted Language Learning and Teaching*, 85-109. New York: Newbury House.
- Al-Arishi, A. Y. 1994. An integrated approach to the use of chronology communicative language teaching. *Language Quarterly* 32, 175-191.
- Cotterall, S. 1995. Developing a course strategy for learner autonomy. *ELT Journal* 49, 219-234.
- Davies, B. and R. Harre. 1990. Positioning: The discursive production of selves. *Journal for the Theory of Social Behavior* 20, 43-63.
- Duran, R. P. and M. H. Szymanski. 1995. Cooperative learning interaction and construction of activity. *Discourse Process* 19, 149-164.
- Gavruseva, L. 1995. Positioning and framing: constructing interactional asymmetry in employer-employee discourse. *Discourse Process* 20, 325-345.
- Goffman, E. 1974. *Frame Analysis*. New York: Harper and Row.
- Gonzalez-Edfelt, N. 1990. Oral interaction and collaboration at the computer: Learning English as a second language with the help of your peers. *Computers in Schools* 7, 53-90.
- Gumperz, J. 1982. *Discourse Strategies*. Cambridge, England: Cambridge University Press.
- Healy, D. 1999. Autonomy in language learning. In J. Egbert and E. Hanson-Smith, eds., *Call Environments: Research, Practice, and*

- Critical Issues*, 391-402. TEOSL Inc.
- Kang, S. H. and Dennis. 1995. The effects of computer-enhanced vocabulary achievement of ESL grade school children. *Computers in Schools* 11, 25-35.
- Kasanga, L. A. 1996. Peer interaction and L2 learning. *The Canadian Modern Language Journal* 52, 611-639.
- Kleifgen, J. A. 1992. *Social Interaction at the Computer: The Merging of Talk and Text*. Literacy Center, Technical Report 2-1. NY: Teachers College, Columbia University.
- Lee, M. 1993. Gender, group composition, and peer interaction in computer-based cooperative learning. *Journal of Educational Computing Research* 9, 549-577.
- Mehan, H. 1989. Microcomputers in classroom: Educational technology or social practice? *Anthropology and Education* 20, 4-22.
- Piper, A. 1986. Conversation and the computer: A study on the conversational spin-off generated among learners of English as a foreign language working in groups. *System* 14, 187-198.
- Stevens, V. 1989. A direction for CALL: From behavioristic to humanistic courseware. In M. Pennington, ed., *Teaching Language with Computers*. LaJolla, CA: Athelstan.
- Stone, L. A. 1992. Language labs and communicative language learning: Drawing parallels from CALL. *CAELL* 3, 25-35.
- Swain, M. and S. Lapkin. 1998. Interaction and second language learning: Two adolescent French immersion students working together. *The Modern Language Journal* 82, 320-337.
- ten Have, P. 1991. Talk and institution: A reconsideration on the asymmetry of doctor-patient interaction. In D. Boden and D. Zimmerman, eds., *Talk and Social Structure*, 38-163. Cambridge, England: Polity Press.

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received: July 7, 2003

accepted: August 28, 2003

APPENDIX A

Summaries of One of the Episodes in the Software Program:
A Strange Street

A dialogue between Maru and John is heard in the scene reproduced in Figure 1:

Maru: Ur, Yur Gee Gah Ur Dee Yah?

{Uh, where am I?}

John, where am I?

John: It's the maze.

Maru: Maze?

Mee Roh? Ur, Ur Tturt Geh Nah Gah Yah Jee?

{Maze? Uh, How can I get out of here?}

John: Dont worry. I'll help you.

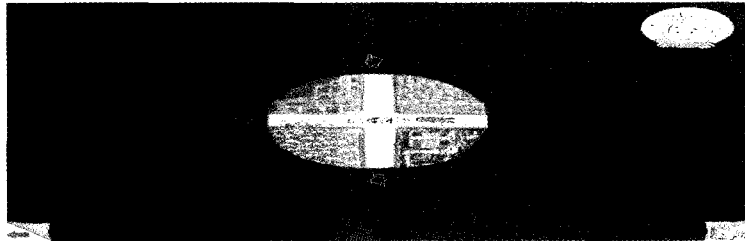


Figure 1. Scene for the First Task

John begins to help Maru get out of the maze. He gives directions as to the way out. The first task here is to follow John's instructions (e.g., Turn right, Turn left, Go straight). Users have to click on one of the three flashing arrow signs that indicate each direction, i.e., right, left and straight. John also gives feedback such as Correct and You're doing well. If users click on John on the top right corner of the screen, they can hear his directions repeatedly. At the end of this task, three gates, each having different colors, appear in front of Maru, and John gives an instruction (e.g., Open the yellow door). Users have to click on the door according to John's instruction. When this is done successfully, Maru is inside of a room in which the second task is provided and where he meets the magician (See Figure 2):



Figure 2. Scene for the Second Task

The magician warns Maru that if he fails to perform the next activity, he will not get out of the room. The task is to click on the icons for each body part given on the bottom of the screen according to the magicians instructions (e.g., Touch my foot).

During the activities in the seven episodes described above, users can go to the sections learning words and dialogues used for the activities. If users click on a word or a sentence, it is read aloud. If the icon next to the Korean translation is clicked on, the computer provides explanations of the meaning and usage of the word or the sentence. Examples of these sections are shown below in Figures 3 and 4:

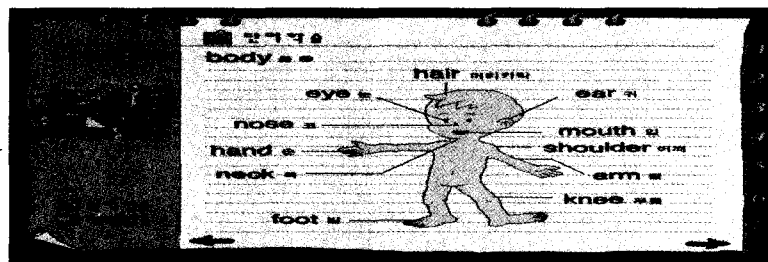


Figure 3. An Example of the Screen for Learning Words

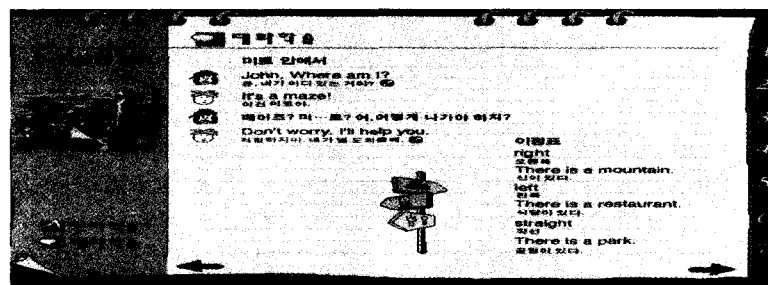


Figure 4. An Example of the Screen for Learning Dialogues

APPENDIX B
Transcription Conventions

Notation	Definition
CAPS	Utterance spoken louder than normal
,	A continuing intonation, not necessarily between clauses
.	A falling intonation contour
?	A rising intonation contour
!	Animated voice tone
[Overlapping utterance
(xxx)	Utterance unclear
{ }	Translation of Korean talk into English