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CMC in English Language Learning: Gains and Losses*

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This paper aims to address the gains and losses of the CMC environment in Language learning. Data were attained from twelve middle school ESL students who took English as a second language class and twelve pre-service teachers taking ESL foundation course. This exploration describes the role of CMC focusing on its' advantages and disadvantages which language teachers need to consider. The findings revealed that the teachers, tasks, and other elements involved in the CMC environment provided several gains and losses for many areas of learning. This implies that CMC alone does not provide an optimal learning environment, but rather it is used as an essential tool in providing opportunities to enhance language learning. Several suggestions are made for teachers and pre-service teacher education how CMC instruction might be better designed. The paper concludes with some practical considerations for future research in the area of CMC.

[Computer-Mediated Communication/ESL/advantages/disadvantages]

I. INTRODUCTION

Over the past three decades, computers have become common instructional tools in the language classroom. To date, a number of studies suggest that computer-mediated communication (CMC) can improve language skills (Bower & Kawaguchi, 2011; Pennington, 2004; Zhang, 2009), enhance student motivation (Greenfield, 2003; Hanson-Smith, 2000), reduce anxiety (Kern, 1995; Sullivan, 1993), and facilitate social learning (Barrs, 2012; Warschauer, 1997). In light of these benefits, previous research in the area of CALL has embraced CMC exchanges as one of the most useful tools for practicing and developing communicative competence in the target language. In addition

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to those benefits addressed above, several positive aspects on CMC can be found in many studies. Noticing the point, accordingly, the current study will discuss on the gains in the CMC learning environment. On the other hand, the dark side of CMC needs to be addressed since little attention has been paid to the disadvantages of CMC so far. The study, therefore, will discuss on the losses in the CMC learning environment as well.

In fact, there exist many benefits and drawbacks in CMC apart from language learning itself such as motivation, learner autonomy, computer skills, and intercultural awareness. Therefore, this paper aims to discuss several key issues on the role of CMC in terms of its gains and losses. In particular, the discussion focuses on three key areas that language teachers need to consider: language learning, creative thinking, and other areas of learning. In order to address those issues, this study presents concrete data emerged from an exploratory study on CMC. The emphasis on advantages and disadvantages helps give meaning to many research findings in the area of CMC.

II. LITERATURE REVIEW

1. Role of CMC: Advantages

Past research on CALL has pointed to a variety of benefits of CMC for many reasons. For example, Lee (2008) stated several benefits of the use of CMC: the quantity of the learner output, the quality of output, and the possibilities offered for the students' attention to form. The visual salience of a text-based CMC discourse increases learners' opportunities to make output modifications as well (Lai & Zhao, 2006; Warschauer & Kern, 2000). Pasfield-Neofitou (2011) also mentioned the benefits of online environment in terms of providing greater opportunities for language production for L2 learners. Others found that CMC gives language learners opportunities for target language practice with Native speakers who may help them with a task in a collaborative way (Arnold, Ducate, Lomicka, & Lord, 2005; Itakura & Nakajima, 2001).

In addition, one of the most crucial aspects in CMC environment is that it offers text-specific and various types of feedback for individual learner. In fact, feedback is a central part of language learning, including second and foreign language, across the world (Hyland & Hyland, 2006; Ros i Solé & Truman, 2005). Specifically, the absence of nonverbal cues in text-based CMC positively affects on corrective feedback in L2 learning (Lee, 2008). Moreover, feedback fostered students' positive progression with statistically significant results (Chandler, 2003). In CMC, Murphy (2010) found that learners exposed to elaborative feedback during Web-based collaborative reading exercises.

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Furthermore, a reduction in anxiety in comparison to face-to-face speech has been claimed as some of the most important implications of CMC for language learners (Chen, 2005; Fotos, 2004). In other words, CMC provides learners with a less threatening means of communication. In addition, learners gain autonomy provided by independent learning environment which can lead to learner-centered language learning (Huh, 2011; Pasfield-Neofitou, 2011). It is also found that communication with Native Speakers of English through CMC can help learners to amend stereotype and to expose them to language variation in the form of communicative language use (Kano, 2004; Yoshimura & Miyazoe-Wong, 2005).

According to Loveless (2002) and Shneiderman (2002), CMC can promote creativity by accelerating students' language learning process and by supporting their creative thinking development. In other words, CMC can help expand creative thinking while interacting with authentic interlocutors. For example, during discussions through CMC, teachers can ask meaningful questions to help learners develop their imagination and their skills in flexible idea generation, fluent expression, and detailed explanation (Huh, 2007). In terms of research, CMC provides private space for learners and teachers to work together. Then it allows the researcher to preserve text-based data such as conversation messages.

Overall, it seems to clear that CMC is a powerful tool when used carefully. Therefore the gains and losses addressed in this paper would help language teachers and researchers to effectively use CMC by providing important issues to consider.

2. Role of CMC: Disadvantages

Whereas the advantages of CMC are prevailing, the discussion on the disadvantages of CMC is relatively lacking. However, it is important to acknowledge both sides of features in order to fully understand and effectively use the CMC tool. To date, a few studies have dealt with the drawback of CMC. In fact, there are several disadvantages that language teachers and students need to consider.

First, technology problem may occur and it makes learning difficult. As Olaniran (2006) pointed, the lack of familiarity with a communication technology can be primary concern in CMC, and create anxiety for students before they develop a sense of comfort with it. Along this line, Olaniran (2004) suggested CMC teachers must be flexible to address unforeseen contingencies that might to arise in CMC course. In addition, the issues of learner access, institutional security, or timetabling restrictions can make obstacles in some contexts (Ros i Solé & Hopkins, 2007).

Second, the materials used may make it difficult to meet the need of individual students. For instance, it may hard to select and adapt or modify materials in CMC environment. It takes a large amount of time and effort in comparison with the face-to face class in that teachers should develop more detailed guideline for their students. Different levels of computer technology may also affect the quantity and quality of materials. This can be another limitation of CMC.

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III. METHOD

1. Participants and Settings

The participants were selected by convenience sampling strategy based on easy accessibility. Twelve ESL learners of advanced English proficiency and twelve pre-service teachers participated in this study. The ESL students were recruited from a pull-out ESL program at a middle school in the United States. Nine of them were from 6th grade and three students were from 7th grade. They were of three first language backgrounds, Spanish, Chinese, and Mongolian. The pre-service teachers who were paired with the ESL students recruited from a university in a northwestern state. They were taking the ESL foundation course aimed to provide K-8 education majors with research-based practical knowledge that they would be able to apply in a variety of instructional contexts.

2. Project Organization

Each student-teacher group worked on an asynchronous CMC project which included three tasks which are '*Mystery numbers*', '*Take me home*', and '*This land is your land*.' They used a Web-based Discussion Forum (WDF) to communicate. The WDF allowed the researcher to observe the learning process and to monitor their interaction by providing primary data, that is, the on-going discussions between the ESL students and the pre-service teachers.

TABLE 1
The Task Objectives

Step	Objective
Preparation	Topic introduction Thinking & Brainstorming Basic questioning & Responding
Incubation	Higher order thinking questioning & Answering Expressing topic-relevant original thoughts Providing & Receiving scaffolded/ implicit feedback
Illumination	Detailed idea development Expressing elaborative thoughts Providing & Receiving specific/ explicit feedback
Verification	Complete idea organization Sharing & checking final thoughts Providing & Receiving overall language support

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The task was designed for the ESL students interact with their partners in-depth and create a comfortable climate for expressing their original thoughts. The task guidelines and directions are based on the ideas from Torrance and Safter (1990) who suggested the way of training creative thought. The detailed descriptions are as follows:

- Carefully read the outline of your task.
- Actively express your feelings and ideas.
- Actively interact with your partner.
- Answer any questions that your partner asks.
- Complete a composition at the end of each task. Write as much as you can.
- Do not hesitate to express your feelings and ideas because your thoughts are very curious and important ones that make you become a good thinker.

The ESL students were asked to engage in and complete the task by answering questions from and interacting or communicating with their partners. The tasks were intended to include the steps of preparation, incubation, illumination and communication that systematically enhance English learning and creative thinking. The specific objectives of the task are shown in Table 1.

3. Data Collection and Data Analysis

The data include discussion messages from the WDF, survey questionnaires from the ESL students and pre-service teachers, and reflection journals from pre-service teachers and the ESL teacher. The discussion data were collected throughout the semester in order to explore the learning and thinking process of the ESL students by focusing on the gains and losses in the CMC environment. The survey questionnaires were semi-structured form including both open-ended and close-ended questions, and they contain several questions to investigate the students' overall perceptions and attitudes toward the task experience in the CMC environment. In addition, pre-service teachers' journals were collected so that they provide how they perceived on their partner student' language use and attitudes. Data were analyzed by focusing on the role of CMC in terms of the gains and losses for the ESL students' learning process and product. Three data sources which are discussions, survey responses, and reflection journals were analyzed by qualitative data analysis manners.

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IV. RESULTS AND DISCUSSION

1. Role of CMC in Language Learning

1) Gains in Language Learning

In this study, the data showed that ESL students had several gains and losses from opportunities presented in the CMC environment in terms of language learning. The roles of CMC in opportunities for students' language learning are addressed with emerging themes, that is, input, interaction, output, development of BICS and CALP, and other gains related to language learning.

(1) Input

In this study the CMC helped to provide several input opportunities for the ESL students. Specifically, the students had three main input opportunities through frequent, scaffolded, and various types of feedback from the pre-service teachers. In terms of frequent input, for instance, the students' noticing and awareness of punctuation increased. This may be due to constant and frequent language input from their partners' constant input that provided correct models of punctuation. The input opportunities seem to enhance their target language learning by increasing their noticing of language errors, heightening clarification of meaning and providing positive and encouraging feedback. Even though some students did not receive comprehensible language input, when they were struggling to communicate and were engaged in trying to understand and to be understood during interaction (e.g., negotiation for meaning), their attention could contribute to learning language forms as well as meaning (Gass, 1997; Lai & Zhao, 2006; Long, 1996).

Therefore, input itself provided from the CMC environment in this study could benefit the students, although the use of all the learning opportunities cannot be clearly found in their output within the short-term period of the study.

(2) Interaction

From the CMC interaction in this study, input opportunities seemed to be reinforced since the students could enhance their understandings about task, questions, and the meaning of certain concepts through negotiation. Research notes that taking part in interaction with opportunities for negotiation for meaning can provide comprehensible input (Iwashita, 2001; Kitade, 2000), pushed output (Swain, 1985, 1995), and opportunities for noticing the gap between what students know and need to know (Li, 2010; Smith, 2004), and that these are important parts of the language-learning process.

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Interaction with these conditions as occurred during the project, therefore, may facilitate the students' second language acquisition.

In addition, the data showed that the students expressed themselves more openly as they built a friendly relationship with their partners. The excerption shows how a student and a pre-service teacher built a good rapport through the CMC interaction.

S: Do you have a pet?
T: I don't have any pets! I want a fish but I'm bad at taking care of them! I wish that could have a dog but I cannot afford one and the place I live I can't have one in my apartment!... I hope these answers help you to help you to get to know me better!

The close partnership also may have helped them to expand their discussions beyond the task related topics and allowed them to have social interaction opportunities while sharing their personal issues with their native English speaking partners.

The student survey data showed that nine out of twelve ESL students perceived that they had helpful, useful, and meaningful language learning experiences through the interactions in the CMC environment. The responses imply that the students had opportunities to enhance their social language competence through interactions in the CMC environment. The result suggests that teachers need to be aware of the role of CMC in providing interaction opportunities that are important for language learning. In addition, the findings from this study also suggest that teachers can increase the opportunities for individual support and social interaction in CMC environments. More research can be conducted on how interaction in CMC is different from face-to-face classrooms and how the interaction can be made most beneficial to students.

(3) Output

Regarding the output opportunity, the features of the asynchronous CMC environment in this study provided the ESL students with time to develop and refine feedback received from their partners, and in turn, it may offer them a chance to produce more deliberate language output. This shows that, as Swain (1995) mentioned, learners need opportunities to produce comprehensible output with the exposure to comprehensible input. This aspect also implies that CMC environment can enhance language learning with various opportunities by providing different types of questions or problems, and in this way, language learners could have more opportunities to produce the target language in various ways.

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(4) BICS and CALP development

In general, CMC environments such as e-mail exchanges provide students with opportunities to use communicative language more than academic language because of the use of speech-like interactions, although students also are involved in writing activity (Chen, 2005; Foto, 2004; Hubbard, 2004). Similarly, the students in this study mainly had opportunities to practice their communicative language. In general, for example, they used a casual register such as abbreviations, slang, and other informal language forms (e.g., c [see], cuz [because], hey, u [you], etc.).

However, the students were provided with some opportunities to develop their cognitive academic language proficiency (CALP) through the discussion in the WDF. For example, the tasks were related to certain knowledge of content areas so it may contribute to other content areas' learning in addition to learning basic communicative skills. Specifically, the first task (Mystery numbers) is related to mathematics since it addressed various numbers, the second task (Take me home) is relevant to language arts and science, and the concepts in the third task (This land is your land) required some knowledge in social studies. In addition, the pre-service teachers tried to incorporate content area knowledge into their discussions. For example, a pre-service teacher asked, "What topics in math are you studying right now? Do you know diameter, radius, area…?" in the discussion related to "numbers."

Even though some of the ESL students might only take the opportunities to develop their basic interpersonal communicative skills (BICS), some others might take the opportunities to develop their CALP. Although CMC environments provide the learning opportunity largely for BICS, it depends on what teachers intend to teach and how they design the task (Cummins, 1979). Therefore, teachers must look beyond survival and social English fluency and develop a CMC curriculum that prepares language learners to be academically successful. Moreover, CMC can provide contextual support for both context-embedded (BICS) and context-reduced (CALP) tasks or activities for language learners.

(5) Other gains in language learning

The WDF learning environment in this study provided the ESL students with new experiences while interacting with their partners by reading messages from the computer screen and by typing with a keyboard. Hence, this learning environment may provide the students a new format for language input, interaction, and output opportunities, as they use computers as language learning tool. This may help them be motivated to more the learning activity.

Second, the permanency feature of the WDF environment allowed the students to be able to keep track of the discussion since the WDF stored all previous messages. This

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helped the students to engage in the discussion at any time, overcoming time and distance barriers. This feature of the CMC environment can provide flexible learning experiences that complement face-to-face environments for language learners. The text can also serve as authentic material in the ESL classroom where it can be the focus of more formal language instruction.

Third, the pre-service teachers were excited to have a real student and were very interested in using computers for helping the ESL learners' learning. Their attitudes can be a gain for the ESL students because they may enhance the discussion, affording the students positive input. The relationship between native speakers' and non-native speakers' attitudes and language interaction should be examined.

Next, most of the ESL students who participated in the study were at-risk students who did not really "get into" school and were less motivated. For the students, the CMC environment in this study seemed to contribute to providing comfortable and less formal learning opportunities and providing an authentic audience. For example, a pre-service teacher noted, "She always answers the questions but the answers are very brief, and then she moves on to basic conversation." This reflects that the student tried to make their discussion more meaningful for herself, and that the discussion provided a forum in which students could make their conversation very authentic. Student control and meaningfulness in CMC are excellent topics for future examination.

Finally, the CMC environment in this study provided the students with individualized and level appropriate input, interaction, and output opportunities due to the one-on-one feature of the interaction. This also allowed the pre-service teachers to pay more attention to their students and to really work on helping their students as they knew more about them. The gains and losses of such activity for pre-service teachers must be explored.

2) Losses in Language Learning

In addition to gains provided by the CMC environment, data showed several losses for the language learning of the ESL students. The losses are discussed below.

(1) Communication tool

In this study, some losses in language learning were found due to the communication tool. First, the students may not be able to express their ideas accurately and/or in detail because communicating using computers is different from face-to-face communication in that it is devoid of pragmatics. For example, they could not use facial expressions or gestures to convey their thoughts or rhythm or pitch to understand (Palme, 1995). In fact, pragmatics is an important part of language learning

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since it facilitates language learners' ability to use and understand socially appropriate language for the situations they encounter. Moreover, the opportunities to practice pragmatics in the target language help students participate more fully in target language communication by helping them to expand their perception of the target language (Bardovi-Harlig & Mahan-Taylor, 2003). Therefore, the lack of opportunities to practice and learn pragmatics in English may cause a loss for the ESL students in this study and others using CMC.

Second, some pre-service teachers did not carefully use the communication tool to edit their messages and they regularly mistyped. Their messages may not provide a good model of language input and thus be potential losses for the language input of the ESL students. The use of language modeled during native speaker/non-native speaker CMC requires additional research.

Next, as input was limited due to some barriers mentioned above such as a lack of opportunities to use pragmatics and native speakers' lack of attention in providing a good language model, interaction also was likely to be limited by the same barriers. Moreover, some participants' lack of understanding about and/or misuses of the functions of the communication tool worked as hindrances to smooth interaction. For example, when some pre-service teachers and ESL students did not use 'post' or 'reply' function correctly and sometimes used them in reverse. As a result, replies were delayed or discussions were disconnected in some cases. Thus, their misuse of the communication tool may have caused a loss for the interaction.

Fourth, technical problems during the discussion caused losses in the interaction and output. For example, some students continuously failed to login to the WDF at the beginning and those students used others' usernames and posted their messages using others' discussion spaces. This created confusion among some pairs, although the problem was solved in the first week.

Fifth, the most salient loss may arise from the ESL students' typing skills: most of them were not trained and skilled in typing and they needed a lot of time to type their messages for the discussion in the WDF. In the survey the students wrote about their difficulties working with computers:

S1: Cause I didn't know any typing.
S2: I did not know how to submit.
S3: I don't type very good and that make me mad.

Because of the lack of typing skill, they might also have found it difficult to ask questions or explain their ideas clearly. Therefore, the students' typing skill, which requires time and effort to learn, may have limited the language input, interaction, and

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output. Teachers need to weigh the advantages of individual language mentoring with the time required when deciding whether to use CMC.

Finally, the students who did not like computers or did not like to communicate using computers might not actively engage in the discussion using computers and this also might cause a potential loss of the language input, interaction, and output.

In summary, many losses and possible losses in language learning due to the communication tool are found in the study: lack of learning opportunity for pragmatics, lack of awareness, understanding, or misuse of the tool, technical problems, lack of typing skills, and unfavorable perception of using the tool. These findings serve as a reminder of importance of the dark side of using CMC. Therefore, teachers must be aware of the possible losses in using CMC tools for their language learners. Specifically, they need to: provide sufficient opportunity for students to be familiar with the tool, minimize technical problems, provide opportunities to practice typing, and be aware of students' perceptions of using a CMC tool before they use it.

(2) Task

There were several losses in language learning opportunities due to the task structure in the CMC environment. The structure of the tasks may have prevented the students from receiving varied input, although the scaffolded, gradual-release structure may have been helpful for some students (Ros i Solé & Hopkins, 2007). In addition, the students had somewhat limited input because the tasks did not provide various resources such as Web resources or books related to the topics. Moreover, the highly structured task may limit the students' output. For example, because the students received similar patterns of questions (input) in each task, the ways to respond are relatively limited and therefore their use of language forms might not vary as much as they could.

Second, since the interaction between the students and the pre-service teachers in this study was based on turn-taking, the students and the pre-service teachers did not have prompt responses from each other. This may be a gain for the students because it provided the students enough time to think and generate their responses. This may play as a possible loss, however, because the delayed interaction may be less motivated without quick responses from each other.

Third, in terms of the task content, many pre-service teachers noted that the task topics did not seem appropriate for their ESL students. They concluded that the first task, "Mystery numbers," seemed easy and thus some students did not stay on task, although the second and the third tasks seemed more appropriate for their students' level of cognition and interests. Therefore, the inappropriate task level seemed to make a loss for their language input, interaction, and output.

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In short, the findings show that the task structure and content can cause several losses in language learning when used in CMC environments. Therefore, the tasks in CMC should be carefully developed by considering the task structure that fits a certain CMC tool in providing learning materials and effective interaction and the level of task content that meets the needs of the target students.

(3) Other losses in language learning

There were also some other losses in language learning opportunities due to the teaching and learning contexts, instructors, and time. First, the contexts where the ESL students and pre-service teachers worked caused several losses: (1) some pre-service teachers did not have confidence because the pre-service teachers' course was an introductory course for an ESL endorsement. They expressed that they did not have enough knowledge or skills to deal with the ESL students. Moreover, a few pre-service teachers in the course did not intend to become ESL teachers. Thus, they may not have provided proper language input for their students. (2) The pre-service teachers' lack of preparation or confidence in dealing with the students may have created a potential loss in interaction: some students did not concentrate on the task because they may not have received proper input that stimulated their interests. (3) Because most of the ESL students have not been educated in creativity, they had a hard time to pay attention to tasks when they were asked questions that required "thinking." (4) Some of the ESL students seemed to focus more on knowing about their partners rather than discussing the task topic. A pre-service teacher wrote, "I have noticed that when she writes me, it almost seems like she is more interested in getting to know me than answering the questions." Another pre-service teacher reflected, "She wanted to talk about other things and really did not pay attention to my questions." Therefore, their lack of attention on the task may act as a potential loss to systematic language gains, although discussing off-task topics increased the opportunity for social interaction. In addition, the asynchronous communication, in which there is no pressure to respond, may also contribute to the students' lack of attention to the task (Mason, 1994).

Second, the limited time for the project may yield losses for language learning. In other words, the communication opportunity that they had did not seem to be enough, although the students could access computers regularly once a week. As presented in chapter four, for example, some students responded with short messages or could not respond because they said that they did not have time to answer the questions completely. Furthermore, the time for discussion was also limited by some unexpected events such as illness and early leave for Thanksgiving break in addition to other time barriers mentioned above (school breaks, standardized testing, and holidays). Thus, the limited computer access also limited their target language input, interaction, and

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output opportunities.

Similar to the ESL students, since most of the pre-service teachers could only use computers at school, they had limited opportunities to post and reply to their partners. Most of the ESL students therefore did not have much language input that exceeded the minimum discussion required to complete the task. Moreover, when the ESL students had trouble getting responses on time from the pre-service teachers, they did not have language input for a certain part of their discussion. Therefore, limited time and mismatched schedules between the students and pre-service teachers may cause losses in receiving language input for the ESL students. The losses in terms of language learning caused by limited time in the WDF environment speak to the possible disadvantages of asynchronous CMC environment. In particular, these lessons suggest that teachers carefully schedule the time for interaction in order to prevent the disadvantages that may take place in asynchronous CMC environments.

2. Role of CMC in Creative Thinking

The discussion of gains and losses in creative thinking of ESL students that arise from the CMC environment in this study is presented below.

1) Gains in creative thinking

As addressed earlier, many CALL researchers have found many advantages in using CMC in language learning. Likewise, CMC also can contribute to accelerating the creative process and in turn enhance the development of creative thinking skills (Loveless, 2002; Shneiderman, 2002). In the current study several contributions of CMC to fostering the creativity of language learners were found in the data. This section discusses the gains for students' creativity due to the communication tool, the task, the teachers' role, and time.

(1) Communication tool

In this study, learning language by communicating with someone over the Internet was a new experience for the ESL students. For this reason, the students were very interested and excited about getting started in the discussion at the beginning, as were the pre-service teachers. The ESL teacher noted that the students were very interested in the activity and that they asked many questions such as "Is this like a chat?" "Can they send pictures?" "Is it like email?" These examples show they were curious about using the communication tool and their high interest in the tool. Excitement about the tool may motivate them to engage in the discussion activity in order to interact with

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partners who are distant from them.

In addition, just as the features of the tool enhanced opportunities for language learning, they also provided positive opportunities for the creative thinking of language learners. Specifically, the WDF provided opportunities for asynchronous interaction that allowed the students to have enough time to think before they responded to their partners. This offered a positive learning environment for them to develop their creative thinking skills. Furthermore, because the tool allowed the students to work in pairs, they were able to have an opportunity to talk personally and to receive individual feedback from their partners. This can be an advantage for them because their learning can be adjusted according to individual interests and creative abilities.

Third, the WDF enabled the ESL students to make changes and to track their discussions. They could keep track of their ideas and further develop them based on previous knowledge or ideas, store them in their own space, and reread those messages as desired. Evidence of the structure of the discussions showed that students used this feature of the tool.

Finally, the CMC technology provided the students with additional information such as visual materials uploaded and provided by their partners in addition to the information in their partners' questions. A few participants used this function in this study and the functions that WDF affords show the potential to simply provide and receive other resources for creative thinking.

In short, the data demonstrated that a CMC tool can provide opportunities to increase motivation, think more, keep and develop ideas, and have a chance to share useful resources with ease and that these opportunities can benefit creative thinking development. In particular, asynchronous CMC seems a useful tool for creative thinking in that it allows students to spend time on task writing (Grooms, 2003).

(2) Task

In this study the tasks were developed based on the creativity literature, and they provided the ESL students with a systematic learning experience for their creativity. Some gains in creative thinking can be discussed due to the structure and content of the task.

First, since the task consisted of systematically developed questions for training their creative thinking skills, the students may practice and develop their creativity incrementally. Second, the pairwork-based learning environment provided by the WDF allowed the discussion to be individualized. In other words, the students were able to have an opportunity to establish one-on-one interaction with the pre-service teachers, who tailored feedback to them to aid understanding of discussion contents.

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This is important because, in accord with the Vygotskian notion of ZDP, one-to-one tutoring is supposed to be the most effective instructional means for inducing reflection that also could contribute to creative thinking (Graesser et al., 1995).

In terms of the task content, the task consisted of familiar topics (numbers, animals, and the States) and, therefore, the students were able to directly get into the discussion (although they learned new words or concepts while interacting with their partners). Since they knew and understood the basic knowledge of the topics, they could develop more or further ideas based on previous knowledge. Moreover, the nature of the content, which was easily accessible, may have helped them to make connections with their experience, and this also may allow them to make their discussion more authentic and in turn meaningful for them. Future research may show the links among these variables.

Next, the survey data showed that students enjoyed the learning experience in the CMC environment because they could think creatively. For example, a student wrote that her favorite experience during the task was imagining about animals: "The animals because we kept laughing and thinking what would happen if animals were people." The positive perception of the students may contribute to their motivation to think creatively. It is also important because students "must be motivated to take the opportunities presented to them and to be cognitively engaged as they perform them" (Egbert et al., 1999, p.6). Therefore, the task may provide those gains for the students' creative thinking.

In short, in this study the structure and content of the task provided several gains for the ESL students' creative thinking. The data suggest that tasks or activities, along with a communication tool, are essential factors for developing language learners' creative thinking. Tasks can influence levels of input, range of thinking, and motivation, which are important elements to facilitate creative thinking. Thus, tasks as the important part of the creativity-enhanced CMC environments need to be investigated more fully.

(3) Role of teachers

The teacher's role as a supporter or facilitator in CMC environments where language interaction between teachers and students takes place is very important (Ros i Solé & Hopkins, 2007). Similarly, the teachers' role for creativity is crucial (Crozier, 1999). For example, in this study the pre-service teachers' role was crucial for providing opportunities for creative expression because they provided questions and feedback. The students who received more challenging questions responded with more imaginative, elaborative, and thoughtful answers. In addition, the pre-service teachers' role may have also contributed to the ESL students' creative thinking development in

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that they became an authentic audience and gave positive and individual feedback rather than being authority figures or giving negative feedback that might discourage the ESL students. Participants in CMC must be aware of the impact of their feedback. This finding is supported by SLA research.

More important, the pre-service teachers' attitudes in this study were receptive and responsive: they helped and guided their students to think creatively rather than forcing them to answer. Because asynchronous CMC does not pressure students to respond immediately, the ESL students could feel comfortable. Most of the ESL students in this study seemed to like talking and enjoyed the learning experience in the CMC environment. Therefore, the CMC environment in this study may contribute to creativity when the pre-service teachers created a supportive learning environment which is open, reflects a positive attitude to novelty, and is accepting of personal differentness (Corpley, 2001), and which allows creative space for students, celebrates individuality, and instills fun in learning (Torrance, 2000). This result concurs with findings from other studies of optimal language learning environments (Egbert, et al., 1999; Krashen & Terrell, 1983).

In conclusion, the role of teachers in this study shows that the teachers who were involved in the project in the CMC environment influenced the students' creative thinking either directly or indirectly. In particular, the teacher who mainly worked with the students could make a huge impact on students' creativity as shown in this study: the roles and attitudes of pre-service teachers brought several gains for creative thinking. The findings suggests for teachers to think carefully about their role in CMC environments. It also calls for research in this area.

(4) Time

As discussed earlier, the project was conducted for a relatively short period and it may not have offered enough opportunity for gains in the ESL students' language learning. However, there were some gains found in terms of the opportunities for creativity due to the time. In other words, even though the students may not had enough opportunities to fully practice and learn creative thinking skills from the project, they clearly had several opportunities to think creatively through the discussion. Moreover, in spite of the time limitation, the survey responses reflected that the students had opportunities for creative thinking:

- I liked it because it was interesting and a lot of thinking. We spend time a lot with that project.
- Because I really think to answer the question.
- We think about new things like maps.

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These responses show that the students had opportunity to "think" rather than just promptly or simply answering questions. This is a gain for their creativity from the asynchronous communication environment and is in keeping with the creativity literature on incubation.

In summary, the CMC environment in this study offered several benefits for the ESL students to think creatively with the opportunities. However, it should be noted, while all children have potential as creative individuals to develop their creativity (DeBono, 1983; Torrance, 2000; Torrance & Safter, 1990), whether such unique potential can be realized is largely determined by teachers who directly provide them with systematic training, and the effective use of technologies such as CMC can help.

2) Losses in creative thinking

The data show that CMC environment in this study also may have caused lost opportunities for creativity due to the communication tool, task, teachers' role, and time. These are discussed below.

(1) Communication tool

As mentioned in the language section, students had limited opportunity to access computers and many of them were not familiar with the computer screen or talking with someone using computers. This may be a hindrance in generating ideas related to the task. In addition, the students' typing skills and attitudes toward computers might influence their creative thinking and output. For example, the ESL teacher noted, "They have some great ideas and energy, but are slow typers." This implies that students need enough time to explore a communication tool and to be familiar with the tool before they use it for real lessons. In this way, the losses resulting from technical difficulties might be prevented.

(2) Task

Because the task was highly structured, losses also may arise in creative thinking area. First, the students may have limited opportunities to think and express diverse thoughts in various ways with various topics. In addition, they had limited resources that might restrict them in their creative thinking because the discussion took place mainly relying on the material given. Working as a pair also could be another loss (while in other ways a gain) because the students did not have other opportunities to share ideas with other classmates and pre-service teachers in the WDF. This suggests that features of a CMC tool impact the task to benefit or not teaching and learning creative thinking. Thus, teachers should select the most effective communication tool

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according to the learning objectives and their students' needs so that they can stay on top of the needs of their students' creative thinking.

(3) Role of teachers

A few pre-service teachers in this study did not fully play their role, although most of the pre-service teachers performed their role appropriately as discussions progressed. For example, some missed postings in some cases or posted several messages at once. This may have made it difficult for their students to learn according to the steps they needed to follow. The incomplete or insufficient role of the pre-service teachers may have made a loss for the ESL students' creative thinking. This suggests as other research has that the role of teachers as interlocutors in one-on-one CMC environments, as it was in this study, is important to make learning better for students' creative thinking.

(4) Time

Similar to the findings in language learning, the short study period also may not offer enough opportunity for the students to practice and develop creative thinking skills. Without further experience that can reinforce their creative learning experiences from this study, they might not have opportunities to increase their creative skills.

In summary, there seem to be some gains and losses for the ESL students' creativity in the CMC environment in this study. The findings suggest that teachers could create either gains or losses for creative thinking by determining and carrying out the feature of CMCs, tasks, time, context, and their roles for their students. The findings also imply that creative thinking might be effectively taught if teachers use appropriate CMC tools and consider several attributes that could influence the learning of creative thinking skills.

3. Role of CMC in Other Areas of Learning

The CMC environment in this study provided learning opportunities in other areas in addition to language and creativity. This section addresses gains and losses that the CMC provided for other areas of learning.

1) Gains in other areas

The gains provided by the CMC environment in this study include motivation and learner autonomy. The discussion about other gains follows.

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(1) Motivation

The CMC environment in this study seemed to motivate the ESL students to engage in communication with their partners. For example, they were excited to work with a real person using computers and nine out of twelve ESL students responded in the survey that they liked learning English with computers because:

- I liked to learn English because it teaches you a lot.
- I did like because he or she, we could talk.
- Because it was interesting and fun.
- I liked it because it's fun and it's like you have good friend on Internet.

These responses reflect the students' positive perceptions toward using computers for their learning. In addition, they also seemed to be motivated by the opportunities to communicate with distant partners and to be given opportunities for thinking. For example, the students also answered the question that asked about their overall feeling about the project:

- I think it is the most interesting g project I never do with computers.
- We spend time writing for our partners. This was a good project.
- I liked it because it was interesting and a lot of thinking. We spend time a lot with that project.

These responses show that using computers appealed to the students and heightened their interest in working with a communication tool to interact with partners.

In addition, as discussed in earlier sections, the asynchronous pair-work setting may contributed to increased motivation of the students since the features of individual interaction helped the pre-service teachers to understand better about their students' level of proficiency, interests, and weaknesses or strengths through close interaction, and in turn, these allowed them to provide appropriate input. Researchers in both SLA and creativity have pointed out that a supportive and friendly environment, in which students feel free to take risks, is essential for increasing learner motivation (Burleson & Selker, 2002; Csikszentmihalyi, 1996; Kötter, 2003). Likewise, the majority of ESL students in this study said that they enjoyed communicating with partners because it helped them to learn and share ideas. The discussion data also showed that they talked more about themselves as they became familiar with their partners. Findings from other studies also reflect that students felt safe in discussing with partners and they were more motivated to take risks (Healey, 2007; Sweigart, 1991).

Furthermore, the CMC environment in this study allowed openness in some

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responses that is important to make learning enjoyable. Providing opportunities for students to use their imagination may be essential to creating a learning environment with low anxiety and high motivation. In addition, positive feedback may contribute to increasing their motivation toward learning. To date, many CALL researchers have found that CMC can reduce the intimidation factor of writing and practicing the target language (Beauvious, 1997; Chen, 2005; Fotos, 2004; Lee, 2005). Data in this study support this finding by showing that the ESL students became more comfortable in interacting in WDF as they had more interactions with their partners. For example, the students who had had relatively many interactions with their partners wrote more about their personal issues such as family and friends. In other words, as the relationship became stronger the students seemed more open and expressive. The quality of their discussion, meaning their creativity, output amount, and their willingness to share, also increased as they established a close relationship with their partners.

In short, CMC helped the ESL students increase motivation by providing a novel learning experience with computers, a real communication partner who spoke their target language, and a safe learning environment with low anxiety. These findings support the important role of CMC in motivating learners. Accordingly, in designing a CMC environment, teachers need to take factors that can increase students' motivation into account to maximize their students' learning.

(2) Learner Autonomy

Zone of proximal development (ZPD) is the difference between a student's capacity to solve problems on his own and his capacity to solve them with assistance (Vygotsky, 1978). According to Vygotsky, full cognitive development requires social interaction and mediation. In the current study, since the ESL students engaged in the task activity under their partners' guidance, their higher level of thinking may be developed through the social interactions with partners by narrowing their ZPD. However, even though the learning took place by the guidance of the pre-service teachers, the ESL students also had opportunities to work autonomously. For example, scaffolds provided by their partners may gradually increase the students' responsibility to work on tasks and respond to questions, and thus, reduce control from the pre-service teachers as their discussion progressed. The discussion data showed that the students increased posting initial messages rather than posting replies as the discussion progressed. More important, as previously mentioned several times, the pre-service teachers' receptive and responsive attitude toward the students' responses may help the students become less intimidated in expressing their creative ideas and increase their autonomy.

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Therefore, the findings from this study imply that CMC can support language learners to establish or strengthen their autonomy if the teacher performs as a guide or facilitator and provides safe learning environments where motivation can be increased and anxiety can be minimized.

2) Losses in other areas

The CMC environment in this study contributed negatively as well as positively in areas such as motivation and self-confidence, as it did for language and creativity. This section addresses the negative roles of CMC in two areas.

(1) Motivation

Even though many elements seemed to contribute to the students' motivation as mentioned previously, their motivation might be decreased in some cases: when they did not understand or were not interested in the task topics or questions and when they felt bored with a certain discussion. For example, four out of fourteen students responded that they do not want to participate in this type of activities in the future because it is hard, it is boring, or they did not like it.

In addition, technical problems contributed to a loss to their motivation. During the task activity, several technical issues were found. The most significant barrier was the disconnection of the network: when it happened, the participants could not work in the WDF and thus the students were not able to post or receive messages. Moreover, at the beginning of the study, some ESL students failed to login to the discussion forum and some others could not successfully upload their messages to the WDF. Even though the majority of students said that they would do it again, these experiences may decrease motivation for the ESL students and the pre-service teachers.

Third, some ESL students had partners who did not respond for a long time, thus they had to post messages without their partners' feedback. In addition, a few pre-service teachers did not provide enough feedback to their students for certain weeks. In those cases, their discussions did not progress smoothly and, according to the ESL teacher, the ESL students' interest in and commitment level to the activity decreased. The ESL teacher pointed this out mentioning, "We have had troubles getting responses on time." Accordingly, the personality or schedules of the participants in using the asynchronous communication tool may create a time lag and it could act as a loss for motivation.

Fourth, the ESL students' level of participation seemed to largely depend on the pre-service teachers' level of participation. In other words, the students' use of the opportunities and their output largely depended on their partners' input. For example,

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the students who received relatively fewer messages from their partners posted fewer messages than other peers and they showed the tendency to create shorter messages than others. Similarly, the pre-service teachers who did not provide a lot of feedback to the students also received fewer responses from the students. For instance, while the number of messages posted by the pairs who had many correspondences were almost double (27messages) in comparison with the other pairs' (13messages). This shows that the degree of participation or interaction depends on the interactivity of pairs. Research should investigate further the factors that influence this interactivity.

Fifth, the structure of WDF may a cause motivation decrease. For example, there was not any closure to the tasks because of the time restriction and this made some participants leave tasks unfinished. In addition, some pre-service teachers were unaware that each of the three tasks had its own discussion space and waited to receive answers from their students in the wrong space after the time period had passed for the previous task. The confusion might be caused by the structure of the communication tool, WDF, although it also may result from the participants' lack of awareness about the instructions. Therefore, the confusion or misuse of the discussion space may provide losses for learning and motivation by distracting both the pre-service teachers and the ESL students.

In short, losses of motivation can be caused from the students' lack of interest and understanding of tasks, technical skills, interaction with partners, and the structure of the communication tool in CMC environments. The findings suggest that research can investigate links between these variables in the CMC environment, and that teachers need to be aware of the factors that could act as possible losses in learner motivation in CMC environments.

(2) Self-confidence

As discussed earlier, some of the ESL students had a hard time concentrating on the task and needed to have guidance to return to the task since they were not used to the environment. Thus, the task itself challenged them in their context and it may act as a loss for their self-confidence if some of them were frustrated or discouraged by the task experience.

Similarly, the pre-service teachers may lose their self-confidence as teachers from the teaching experience in this study. For example, a few difficulties that the pre-service teachers faced during the discussion may decrease their confidence. Some did not think they were prepared to develop appropriate questions, to create good feedback, and to guide the discussion well enough for their ESL students. Especially for the first task period, their self-confidence in interacting and teaching ESL students seemed low. In addition, they showed a lack of understanding about the task activity and their role.

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In short, the lack of similar learning experience of the ESL students and the lack of readiness of the pre-service teachers for teaching in a CMC environment may result in losses in their self-confidence. In general, self-confidence is an important driving force of learning. Therefore, from the findings, CMC experiences need to begin with enough preparation of participants. In this way, both students and teachers would establish strong confidence for learning and teaching with the communication tool and in turn it would help them perform their roles better.

In summary, the CMC environment in this study provided gains and losses for language, creativity, and other areas of learning for the ESL students. However, all of these opportunities can be maximized or minimized depending on the choice of communication tool, task, and other attributes that can influence the opportunities, gains, and losses for learning. More important, it should be noted, as the findings from the study imply, CMC can support a number of important learning objectives if the activities are well planned and purposeful (Warschauer, 2001).

V. CONCLUSION AND IMPLICATIONS

In the CMC environment in this study, ESL students participated in a web-based discussion forum (WDF) with an individual discussion partner to complete a project activity that was designed for them to learn language and creative thinking. Although the results show many advantages for language, creativity, and other learning, there were some losses found from the learning experience in the CMC environment because of the communication tool, the task, the context, the participants, and time. Therefore, the findings from this study suggest several implications for researchers, teachers, and teacher educators. Based on the issues discussed earlier, some implications for research, practice, and teacher education are made.

First, in terms of research, researchers need to be aware of the limitations found in this study such as the research period, task structure, types of communication technology, learner background and context, technical problems, readiness of participants, and affordances of computer use in conducting research on CMC. Therefore, future CALL research should be conducted to design a level-appropriate task that fits a certain CMC environment to maximize learning opportunities for language, creativity, and other areas of learning.

Regarding to the practice, individual teachers can awaken, sustain, or direct a student's interest. Especially when language teachers use CMC tools for teaching and learning, they need to consider several elements that create learning opportunities for their students. Based on the findings of this study teachers should provide level-appropriate tasks that can fill learners' ZPD, and frequent, positive, and scaffolded

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feedback for individual learners so that their instruction can make learning authentic and autonomous. More important, the overall learning environment should be a supportive one where students can engage in the task mindfully.

The data in this study also provide several important implications for teacher education. First, language teacher education needs to provide pre-service teachers with opportunities to work with real-language learners in CMC and to learn the advantages and disadvantages provided by the environments. Second, pre-service teachers should have opportunities to discover the gaps between theory and practice while dealing with real students through CMC. Finally, they need to develop teaching strategies to deal with difficulties in teaching in CMC environments.

In conclusion, teachers should keep in mind the positive and negative roles of CMC when they employ it for their contexts. Because CALL is a relatively young field, there is also a great need for more research in each of the areas mentioned. It is hoped that the various issues which emerge from CMC teaching and learning in this study would help inform other contexts with various language learners.

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Examples in: English
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