

How Can We Make Language Learning Effective and Sustainable Outside the Classroom Using Self-access CALL with Blogging?

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Abstract— This paper investigates how and to what extent learners utilize the computer assisted language learning (CALL) system outside the classroom. A pretest and post-test design was carried out and the test scores evaluating learners' English proficiency were logged for the quantitative analysis. Throughout the six-month course, the participants were given three types of assignment every week: Assignment (1) to complete compulsory tasks, Assignment (2) to complete optional tasks, and Assignment (3) to report the optional tasks completed and to post some comments concerning their learning on CALL. Their protocols within Assignment (3) were analyzed in terms of cognitive process of learning. For Assignment (3), there were two conditions: for Condition (a) students had to send reports and comments to the instructor via e-mail individually, and for Condition (b) students posted them on the blog launched for the participants. The result of the quantitative analysis showed that both learning time and the number the tasks increased throughout the training period on Condition (b), sharing students' comments on the blog, whereas for Condition (a), few students completed many more tasks on CALL than the weekly obligatory assignment. There were also some differences in the variety of tasks completed; the students in Condition (b) tackled a much greater variety of tasks, and made a greater variety of comments than students in Condition (a). As a result of analysis for report comments, comments from Condition (b) showed the progress of the students' cognitive stages whereas most of the comments from Condition (a) were superficial, just their impression to tasks. The results derived through these comparisons suggest that creation of a learning community outside the classroom would be a key for the effective and sustainable use of self-study-fashioned CALL materials, and would be enhanced by the implementation of a social networking service such as a blog.

Index Terms—e-learning, blogging, learning community, computer-supported collaborative learning

I. INTRODUCTION

EDUCATORS have renewed attention to collaborative learning between peers, and quite a lot of practice and research has been conducted in educational research studies

(e.g., [1]–[4]). In language classes, too, learners share the same challenge in one sense; they all make a difficult journey to be increase their levels of proficiency, and there has been active discussion in the second language (L2) pedagogy research area as with other fields. While most studies deal with the particular skills such as writing competence (e.g., [5]–[7]), reading skills (e.g., [8]–[10]), or speaking ability (e.g., [7], [11], [12]), research has also pointed out the importance for students to have self-efficacy, promote their active-learning and become motivated through peer activities (e.g., [13]–[18]). As evidenced by many studies emphasizing the social nature of learning, one of the most significant outcomes should be that students learn how to learn, and that may not be realized when learning by themselves. Oxford [11] summarized the advantages of cooperative learning as follows: compared to competitive or individualistic learning experiences, cooperative learning is more effective in promoting intrinsic motivation and task achievement, generating higher-order thinking skills, improving attitudes toward the subject, developing academic peer norms, heightening self-esteem, increasing time on task, creating caring and altruistic relationships, and lowering anxiety and prejudice (1997; p. 445).

One of the characteristics of the formation of collaborative learning is a problem-based learning approach. It is widely accepted in the classroom among subjects ranging from children to adults. After Vygotsky (1980) proposed the concept of the zone of proximal development (ZPD) as “the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers [19]”, and Wood, Bruner & Ross (1976) represented “scaffolding” as “a process that enables a child or a novice to solve a problem, carry out a task, or achieve a goal which would be beyond his unassisted efforts” [20], problem-based learning has been examined in relation with learning process by many researchers and educators (e.g., [21], [22]). Bransford elaborated, stating that the cognitive process of problem solving proceeds from i) identification of the problem, ii) definition, iii) exploration, iv) action, toward v) looking and learning (e.g., [23], [24]).

On the other hand, self-study-fashioned computer-assisted language learning (CALL) materials have several advantages over group learning or whole class activities. For instance, it is

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discussed in the context of mastery learning ([25], [26]); this might be due to the idea that it helps learners to “master each learning unit before proceeding to a more advanced learning task [25],” and teacher-paced group instruction, one-to-one tutoring, or self-paced learning with programmed materials [26]. In addition, self-study learning on CALL gives priority to students’ self-initiative toward learning. It allows students to move ahead with their learning needs or their progress as they feel it appropriate, and to learn whatever and whenever they like; they may choose tasks that they consider themselves poor at, or they may choose what they are eager to improve within their specialty. Individual learning can respond to various learners’ individual differences such as their aptitude, interest, concern, comprehension, proficiency, study skills, and learning styles. Because there are various students in one classroom, collaboration often faces difficulties. Learning on their own, however, students tend toward laziness or to develop a sense of isolation, and it is easy for them to give up, unless they are of strong determination for learning; this is especially true for language learning. It would be ideal if the positive advantages of individual learning using CALL were facilitated by exploring the point of view of collaborative learning or problem-based learning.

Therefore, this study aimed to consider the effort necessary to motivate university students and make language learning effective and sustainable using self-study-fashioned CALL with a blog system. The previous survey result showed that most students in our university are familiar with the use of blogs [27]. Blogs are one of the most common and accepted Web 2.0 tools, the new generation of internet tools that integrate all the preceding internet tools’ functions [28]. Its nature of electronic journal with comment function is useful for both personal learning reflection and communication with other people. If the learning community where students exchange opinions and teach each other could be built not only inside the class but also outside the class, L2 learning would be greatly enhanced and expanded. The author has preliminarily considered collaborative learning earlier ([29], [30]); this study expands and deepens the analyses, guided by the following research questions:

- 1) Is self-study-based language learning more effective when constructing the learning community outside the class (under the apparatus mentioned above) than when learning independently?
- 2) Are there any differences in learners’ approaches to tasks?
- 3) Are there any differences in cognitive process and its progress of learning?

II. METHODS

The methods follow the previous research (see [30] in detail). With regard to the descriptions of participants, materials and environment, only the essential parts are extracted here from the previous studies.

A. Participants

Twenty-one Japanese university students (16 males and 5 females, ranging in age from 20 to 23 years old) participated in this study. They were students registered for either of two classes the author offered for the teacher training course of English education. Twelve of them were undergraduate students majoring in English education. The others were undergraduate students, graduate students or research students majoring in various areas other than English education, such as educational psychology, social studies education, or international cultural studies. They were prospective junior high or high school teachers of English language, and highly motivated to develop their own English language skills. Their English proficiency was approximately intermediate through lower advanced level at the beginning of the semester.

B. Materials

The learning environment applied in this study was the CALL system which uses speech perception, production and comprehension training tools that have been mainly developed for second language learners of English.

The content consists of two parts in terms of the learners’ needs: one part is preparation for English certification tests, and the other part is learning material for general purposes. The former consists of sample test questions and training tasks for building up vocabulary and grammar knowledge. For the latter, various tasks related to spoken language comprehension and/or production skills are included, such as intensive phoneme identification tasks, word-accent perception / pronunciation tasks, word / sentence pronunciation / repetition / shadowing tasks, sentence dictation tasks, or filling-in-the-blank listening tasks. In addition to these, several traditional tasks are offered such as word translation tasks with two/three/four alternative forced choices, word/phrase typing tasks, sentence building tasks, and so on.

There is an enormous amount of content in the CALL. About ten to twenty individual trials are delivered together in one block, and the estimated learning time to complete each block varies from one minute or so to twenty minutes or more. The preparatory course for examination has 3,877 blocks, and the general English course has 5,296 blocks in total. The difficulty of the built-in content is estimated to vary from lower intermediate level through upper advanced level for second language learners of English, and therefore the materials are appropriate for the participants’ proficiency level.

C. Design of the Learning Environment

All of the students enrolled at their university can freely access the CALL system from either inside or outside of the campus network. Every student has his/her own ID and password to login to the CALL system, and their personal learning log data is stored in the system. Using the administrators’ authorized ID, the instructor of the class can view the students’ logs, send messages to the students registered, assign new course content, and so on.

The participants were required to be engaged in the assignments using CALL outside the classroom every week throughout the six-month course;

- 1) *Compulsory tasks*: to complete five different blocks per week designated by the instructor.
- 2) *Optional tasks*: to choose and complete any five blocks from the entirety of the CALL system; they can do more than five blocks according to their own learning needs, motivation, etc., however the surplus of blocks to requirement cannot be carried over into the following week.
- 3) *Reflection report*: to report the blocks completed as optional tasks and write a short comment either in English or in Japanese.

It was expected that it might take about ten to fifteen minutes to complete the compulsory five blocks (Assignment 1) while the learning time spent on the optional tasks (Assignment 2) vary from merely five minutes to well over thirty minutes; it depended on the materials which each student chose according to his/her own learning objective. Task 1 and task 2 were self-study-based individualized learning.

When students finished those tasks, they submitted a report (Assignment 3). For the short comment part, the participants were told to write their impressions of the tasks they had done, analyze their own learning, ask questions, if any, to the instructor or discuss the topic which the instructor sometimes gives them. The instructor replied to their questions, made comments about their reports, or provided supplemental explanations as needed. When there were any critical remarks or discussion submitted, the instructor brought them up at the next class.

In regard to Assignment 3, in Class A, the participants were to send reports and comments to the instructor via e-mail individually (Condition A), whereas in Class B, they were to post them on the blog website launched for the study; all the posts could be browsed by the instructor and the participants attending Class B (Condition B). The participants under Condition A could not know what opinions were stated among their classmates unless the instructor raised them as a topic, whereas the participants under Condition B could not only browse all the posts delivered by classmates, but also reply or make advice concerning classmates' comments, ask their classmates questions, chat with each other, etc. The instructor of the course browsed through the blog site regularly and provided some remarks on the blog.

D. Procedure, Data Sources and Data Analysis

A pretest and post-test paradigm was administered in order to examine the training effect of a self-study learning environment using the CALL system. The participants were to take the pretest before the training period started, and the post-test at the end of the period. The tests were provided on the CALL system. Both tests had the same structure, similar difficulty levels, but the test items were different. The test set included various tasks such as phoneme identification, pronunciation, word translation, sentence building, listening dictation, and so on.

The author analyzed the test scores of pre and post-tests, and

the learning logs of the training period on the CALL system for both conditions. On the learning logs, every action was pooled from participants on the CALL system. Report comments were also analyzed from the aspect of both quantity and content. All comments sent to the instructor (the author) for Condition A, and those posted on the blog from participants for Condition B were taken into account; posts by the instructor on the blog were excluded from the analysis.

III. RESULTS AND DISCUSSION

This chapter will examine results referring to the previous research [30] as necessary.

A. Overall Assessment of Training Effect

The participants who could not complete either or both the pretest and post-test were excluded from the consideration of the training effect, and eventually 14 students were subject to analysis (7 students each for either condition; 5 and 3 of them were English education majors, respectively for Condition A and B: See Table 1). Correct response rate for each test task was calculated, and then ANOVA was conducted, where test phase (pretest and post-test) and task condition (Condition A and B) were the variables.

The main effect of the test phase ($F(1, 12) = 1.69$, $MSe = 38.01$, n.s.) and that of the condition ($F(1, 12) = 0.001$, $MSe = 0.05$, n.s.) were not significant. The rate of the overall improvement on the test score ranged 0.932 to 1.24 (the average was 1.04). When inquiring about the score improvement of different kinds of test tasks, it is found that the main effect of the task condition and the interaction between test phase and task condition were significant ($F(7, 84) = 2.56$, $MSe = 283.8$, $p < 0.05$). The result of the multiple comparison test showed that the score of the sentence dictation tasks ($F(1, 96) = 4.59$, $MSe = 549.1$, $p < 0.05$) and the phoneme listening tasks ($F(1, 96) = 7.74$, $MSe = 925.8$, $p < 0.01$) improved from the pretest to the post-test drastically. Next, learning times spent for assignment and amount of tasks completed were calculated, and correlation analysis was conducted between the improvement of the score from pretest to post-test and the efforts involved in learning with CALL. On the whole, neither group showed any correlation: no correlation was observed between the score improvement and both the number of blocks of completed tasks and the learning

TABLE I
NUMBER AND MAJOR OF PARTICIPANTS

Class	Participants		
	Juniors majoring English education	Others ^a	Total
Class A	6 (5)	2 (2)	8 (7)
Class B	6 (3)	7 (4)	13 (7)
Total	12 (8)	9 (6)	21 (14)

^a The distribution of students was beyond the control since students decide which classes to choose.

Figures in parenthesis are the numbers of the students who complete both pretest and post-test, included in analysis.

time throughout the training period, although a weak correlation was observed between the test score improvement and the total number of tasks completed in Condition A ($r = 0.55$, $p < 0.05$).

It was found that CALL material students used was beneficial for the improvement of their perceptual ability of language sound, judging by the result that the scores of the task related to sound perception (phoneme listening and sentence dictation) increased, whereas those of the other tasks, such as traditional word translation or sentence building, did not. For the relation between training effect and learning effort, only Condition A showed significant correlation. The learning time per week varied from 13.1 minutes to 184.7 minutes in Condition A; this might be influenced by differences in learning motivation or in proficiency. However, overall, the lack of significance of the training effect might be due to the crucial shortness of the learning time for both conditions. The estimated time to complete both a compulsory task and an optional task was around twenty minutes per week in the shortest case. In general, it is said that it takes time in to achieve some effective progress in language learning. Although sustaining student learning motivation was given more priority and the number of assignments was set smaller than desired, the training effect remains a subject for future investigation.

B. Behavior on CALL during the Training Period

taken up as optional assignments. The participants were interested and eager to work on the exercises for English certification tests in both conditions (25.4 % in Condition A, and 25.9 % in Condition B). The other task types found some

TABLE II
TASK TYPES CHOSEN AS AN OPTIONAL ASSIGNMENT

Task Type	Condition A	Condition B
Materials in prep course for English certification tests	25.4 %	25.9 %
Perception or production of phoneme, accent, intonation	25.5 %	34.2 %
Vocabulary (spelling, word translation, pronunciation, etc.)	42.7 %	22.6 %
Sentence building (grammar, shadowing, dictation, etc.)	6.4 %	17.3 %

Note: This table is modified from Fig. 4 printed in [30] by the author.

differences between the conditions. In Condition A, more than 40 percent were tasks related to vocabulary knowledge, whereas only 6.4 percent of the tasks were related to grammar or sentences (Table 2).

It seemed not to be a reflection because the participants in Condition A preferred the tasks finished in a shorter time. At the beginning of the training period, almost all the participants in both conditions mentioned that they did not feel like doing the sentences tasks because it was rather complicated and took much more time to finish. As a result, fewer and fewer did the sentence tasks in Condition A. On the other hand, some participants in Condition B posted their own attempts to make the sentence tasks comfortable for them, and it was revealed from the log analysis that others in the class tried to do the tasks after such posts on the blog.

Fig. 1 shows the changes of the average of the learning time (gray bars), and the average number of the tasks completed

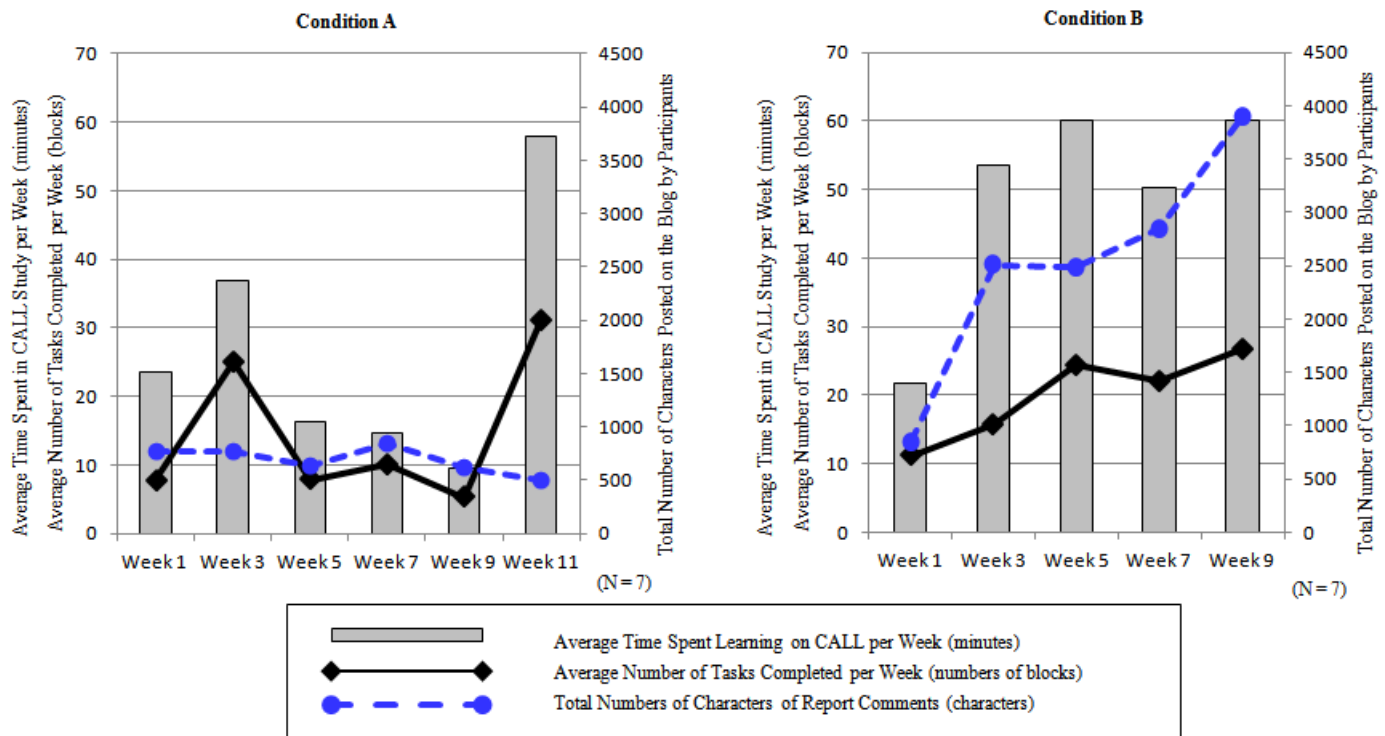


Fig. 1. The changes of the average in the learning time using the CALL (the gray bar), the average number of the tasks completed (the solid line) for every other week; and the total number of the characters of report comments sent to the instructor (Condition A)/posted by the participants on the blog (Condition B) (the dotted line).

Note: These charts are elaborated from Fig. 5 printed in [30] by the author.

(solid lines) every other week. In Condition A, the number of completed blocks was less than ten except for Weeks 2 and 11; that means the assignment was not submitted sufficiently because the minimum was ten blocks. Time spent on CALL was significantly less as well. In contrast, both time and amount increased throughout the training period in Condition B (Due to server maintenance, the training data was not obtained after Week 9). The ratio of the total number of tasks completed, and the ratio of time spent on CALL for Condition (b) to that for Condition (a) was 1.78 and 2.43 respectively. That the amount of the last week was extremely high in Condition A would be in large part due to the “unwillingness and expediency” by students who left assignments undone. Eventually the gap between conditions widened up to 5.05 times the number of tasks completed and 6.26 times the learning time spent for assignments.

C. Number and Content of the Report Comments

Fig. 1 also details the total number of characters in the comments posted by the participants (dotted line). Reports were basically written in Japanese in Condition A, and most of the posts on the blog site in Condition B were also written in Japanese, not in English. The instructor encouraged students to write in English, but did not force them to do so, as priority was given to producing an atmosphere where everyone feels free to write what he/she thinks. As we can see, the trend differed apparently: Students in Condition A wrote as many reports as students in Condition B during the first week, and the amount of comments plateaued during that period. On the other hand, in Condition B, the total number of characters in the postings also increased throughout the period. It can be said that the more actively the blog site was utilized by the students, the longer and more deeply they engaged in learning and communication.

All the comments by students were analyzed from the aspect of content and classified into the categories of problem-solving cognitive process proposed by Bransford (1984[22]); other kinds of comments such as system trouble reports were excluded from classification. Shown in Table 3, comments from the students in Condition B were varied over every stage of cognitive progress while fluctuation was observed for that in Condition A. Most comments went on Process 1), though a large portion of them were simple impressions such as “this kind of task was difficult for me.”

IV. CONCLUSION

This study aimed to investigate the following questions:

- 1) Is self-study-based language learning more effective when constructing the learning community outside the class than when learning independently?
- 2) Are there any differences in learners' approaches to tasks?
- 3) Are there any differences in cognitive process and its progress of learning?

For Question 1, the learning environment was established with self-study-fashioned CALL and the blog. There were many active exchanges on the blog, and therefore it was assumed that the learning community outside the class was constructed

TABLE III
CLASSIFICATION OF COMMENTS ACCORDING TO COGNITIVE PROCESSES

Cognitive Process of Problem Solving (Bransford)	Quantity of Comments (numbers of part or sentence)	
	Condition A	Condition B
1) Identify the problem	26	11
2) Define the problem	2	17
3) Explore the problem	6	28
4) Act	3	22
5) Look and Learn	7	29
Total	44	107

successfully. The students who interacted on the blog were willing to involve themselves in self-study-based language learning for a longer time, and finished many more tasks than they were required to.

For Question 2, the students with interaction completed various tasks; seldom having deflective preference on learning. At the first stage, students tended to avoid somewhat complex tasks, however, their curiosity seemed to be stimulated by comments that called for advice about such tasks, and they were driven to tackle them. While doing these tasks, they had to contrive how to solve them. On the other hand, the students who had no interaction with classmates tended to concentrate on more rapid tasks as a temporary expedient. No training effects were not observed this time; however, the learning attitude must affect whether learners could absorb their learning experiences.

Lastly, for Question 3, from the result of content analysis of reports, students learning in isolation became “competitive” and “individualistic” as Oxford (1997[11]) pointed out, whereas the students communicating with peers tended to want to get involved in the learning community, attempting to solve not only their problem but also their peers' problems, and students' comments were varied over the stages of cognitive progress. It is interesting that they also showed considerably different tendencies in terms of cognition toward the problems to be solved.

As Johnson *et al.* (1994[13]) described, several characteristics of collaborative learning effectively emerged, compared with the conventional group work. Some of the factors created in this study included interdependence, contribution, individual responsibility, motivation for improvement, teacher's participation for adjustment, and so on. Thus, based on the results, the apparatus proposed in this paper can indeed be said to promote collaborative learning among students outside the classroom and produce successful autonomous learning outcomes.

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