関西大学学術リポジトリ
Kansai University Institutional Repository

Using an LMS for Foreign Language Teaching/Learning: An Attempt Based on the "Cyclic Model of Learning"

Using an LMS for Foreign Language Teaching/Learning: An Attempt Based on the "Cyclic Model of Learning"

Seijiro Sumi* and Osamu Takeuchi**

Abstract   The purposes of the study are (a) to put the "cyclic model of learning" into practice by means of an LMS (Learning Management System) for foreign language teaching/learning, and (b) to examine how the "cyclic model of learning" influences improvement of students' English ability in both proficiency and achievement. Current major concerns of CALL (Computer Assisted Language Learning) research have shifted from piecemeal and experimental tests of the use of technology in a single computer lab to seamless and integrated practices in a natural educational setting. In response to this transition, Takeuchi developed the "cyclic model of learning". The model tries to integrate in-class practices and students' outside-class self-learning with the aid of technology. In this article, the "cyclic model of learning" was put into practice and tested on 19 1st-year undergraduate students for one year at a university in the Kansai region. An LMS, named *CEAS* (Coordinated Education Activation System), is employed to support the practice. Data were collected in a variety of ways including tests, weblog, video recording, questionnaires, and classroom observation. Findings indicated that the practice based on the "cyclic model of learning" contributed to the improvement of students' English ability in both proficiency and achievement.

Keywords: CALL, cyclic model of learning, integration, LMS

1. Introduction

Teaching/learning foreign languages with the aid of technology has a long history in both theories and practices. In the 1940s to 60s, the LL (Language Laboratory) was widely accepted and marked the onset of full-fledged use of technology for foreign language education. Since then, along with the surge in technological innovations, the main stream technology used for foreign language education was gradually transferred to computers, and in the 1970s to 80s, CALL (Computer Assisted Language Learning) started to attain its own position in the field of foreign language education[1–3].

According to Warschauer and Healey[4], CALL research has developed through three stages from drill based "Structural CALL", communication based "Communicative CALL", to content based "Integrative CALL". They noted that it is important to incorporate multifaceted aspects of foreign language teaching/learning such as tasks, environment, materials, and technology into practice, which means integration. Bax[5] has also pointed out the significance of recent technological innovations on foreign language education and advocat-

ed the importance of searching for an integrated model that puts students at the center of practice and enables tutors and students to use technologies for foreign language teaching/learning in a natural educational environment.

Since "integration" became an important issue, a new trend in CALL research and practice has been seen. Along with the innovation and diffusion of information and communication technology, the traditional CALL lab has become no longer the only place where students can expose themselves to authentic learning resources for language learning. As a result, CALL practitioners have placed greater emphasis on enhancing target language use beyond the classroom with the aid of technology[6].

Having been influenced by these changes, instruction using an LMS (Learning Management System) as a tool for achieving integration has started gaining attention. The advantage of using an LMS as a part of practices is that it allows tutors to supplement in-class instruction and to incorporate students' self-learning into classroom activities[7–9]. However, the theoretical and pedagogical frameworks for this new perspective have yet to be thoroughly investigated[10].

Additionally, what van Lier[11] mentioned is worth quoting in full to design a practice with the aid of technology. He said, "The more lessons I observe, the more I

---

* Himeji Dokkyo University, Japan
** Kansai University, Japan

become convinced that language development occurs between lessons rather than during lessons, and I do not mean this as an indication that lessons I observed are inefficient or bad. Rather, I feel that language learning is the cumulative result of sustainable effort and engagement over time, with continuity being central". At a Japanese university in an EFL (English as a Foreign Language) context, however, foreign language lessons are usually conducted once a week and the connection between lessons is obscure. What is worse, few opportunities are available for students to speak, listen, and practice their target language in an out-of-school context.

To ameliorate this situation, Takeuchi[12] developed the "cyclic model of learning". The aim of the model is to integrate in-class practices and students' outside-class self-learning with the aid of technology for foreign language learning, and to facilitate students' autonomous learning. Based on the "cyclic model of learning", the authors designed a practice by means of an LMS for foreign language teaching/learning, and tested its practicability quantitatively in this article.

Hence, the purposes of the present study are (a) to put the "cyclic model of learning" into practice by means of the LMS for foreign language teaching/learning and (b) to examine how the practice based on the "cyclic model of learning" influences the improvement of students' English ability in both proficiency and achievement.

2. The "Cyclic Model of Learning"

The most distinctive feature of the "cyclic model of learning" is its integration of in-class practices and students' outside-class self-learning with the aid of technology[12]. To integrate in- and outside-class learning, the preparation and the reflection phases are connectedly placed before and after the lesson.

In the preparation phase, learning resources that are related to the lesson are provided with the aid of technology to activate students' schema and to form their readiness for the lesson. In the lesson, the tutor facilitates students' use of the target language and elicits students' participation in classroom activities. In the reflection phase, students are asked to review the lesson through the learning resources provided with the aid of technology.

By connecting preparation, lesson, and reflection,

the "cyclic model of learning" makes it possible to expand time and space for teaching/learning and creates a learning cycle. The learning cycle can also reinforce students' commitment to lessons and thus facilitate their autonomous learning.

Based on the "cyclic model of learning", to integrate in-class practices and students' outside-class self-learning with the aid of technology, three phases were designed and a role was given to each. The LMS, *CEAS* (Coordinated Education Activation System), was employed to support and to connect the three phases[13].

The "pre-lesson" phase is the first. In this phase, to activate students' schema and to form their readiness for lessons, learning materials which prepared students for lessons were posted on the LMS, so that students were able to use them by logging into the LMS before the lesson. Figure 1 shows an example opening page. On the opening page, background information and reading strategies that helped students to understand the content of the textbook were provided. Additionally, on both sides of the opening page, there were two columns. In the left side column, icons linked to the digitalized textbook were placed and they were labeled "Read 01" and "Read 02". The division of "Read 01" and "Read 02" was decided in accordance with the quantity of texts. Students clicking the icons could visit the digitalized reading material and read it while listening to the narration in English. In the right side column, several overseas external links related to the textbook contents were posted with images, so that students could broaden their knowledge beyond the contents of these contents and expose themselves to authentic English. Figure 2 shows how the LMS and learning materials worked together.

The second phase is the "lesson" phase, in which the tutor gave a lesson in an ordinary small size classroom. The main focus of this phase was to elicit students' participation and utterances in the target language. Collaborative activities such as group work, pair work, and group competition were introduced to facilitate tutor-student and student-student interactions.

The last phase is the "post-lesson" phase. The main focus of this phase was to give students additional learning materials on the LMS and to guide them to the next lesson. All learning materials were developed and posted on the LMS by the first author through consultations with the second author who was the practitioner of this class. The first author also participated in every lesson and worked as a TA (Teaching Assistant), and soon after
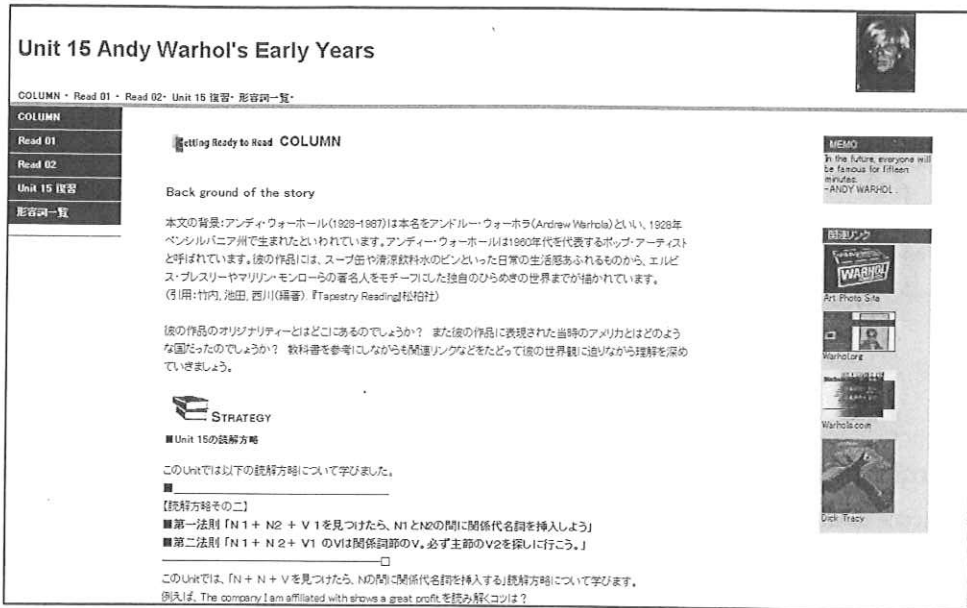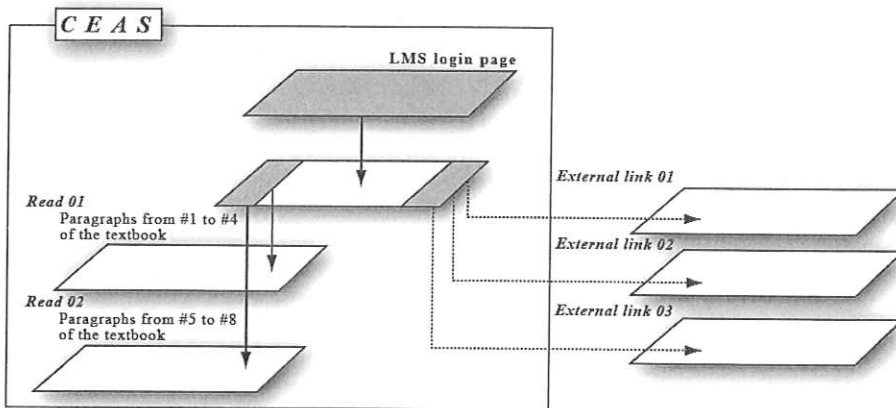
Figure 1.   An Example Opening Page.

Figure 2.   The Layered Structure of the LMS and Learning Materials.

the lesson, from notes and video tapes recorded during the lesson, he made learning materials that reflected the contents of the lesson and posted them on the LMS. Example contents of additional learning materials included the important points of the lesson that the tutor had elaborated on and the answers to the questions that students had asked in the lesson. At the beginning of each lesson, a quiz was given to assess students' under-standing of the previous lesson, so that students were naturally guided to using learning materials posted on the LMS for reflection since important issues and topics that might have been asked in the quiz were summarized in the materials on the LMS.

Figure 3 shows how the three phases worked together with the aid of the LMS.
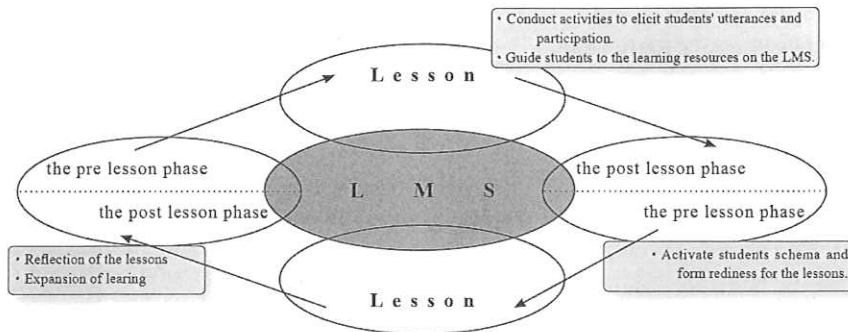
Figure 3. The "cyclic Model of Learning" Applied to the Study.

3. Research Design

The practice based on the "cyclic model of learning" was tested for 19 (4 males and 15 females) 1st-year undergraduate students for one year from April, 2005 to March, 2006. The class was one of selective required courses open only to students who would like to have advanced English lessons. Their English ability was relatively high with the TOEIC® score range of 500 to 600 and they were highly-motivated.

The purpose of this class was to improve EFL students' reading ability. One lesson was held for 90 minutes once a week, and there were 15 lessons in each semester, which means that there were 30 lessons in a year. The lessons were given in an ordinary small size classroom and mainly conducted in English. The classroom had portable chairs with flat writing tables, so that students could easily move them to form seating for pairs or groups (Figure 4).

To examine how the practice based on the "cyclic model of learning" influenced the improvement of students' English ability in both proficiency and achievement, data were collected in a variety of ways based on the concept of triangulation[14]. Triangulation is one research methodology that makes it possible to collect data from multiple resources. The advantage of applying triangulation to research is that it allows researchers to have an opportunity for double-checking. In this study, two kinds of tests scores and the frequency of access log entries were used to examine how the practice influenced the improvement of English.

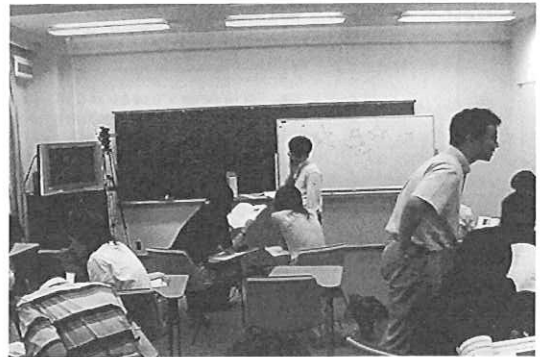To investigate the improvement of proficiency in English, a reading section of a standardized internation-

Figure 4. A Snapshot of One Lesson.

al test for English as a second language, FCE (First Certificate in English) developed by University of Cambridge ESOL Examinations, was administered. The contents of the test are fairly constructed by the institution to scale test takers' reading ability, and the test is widely accepted as a standardized international test. Hence, it seems reasonable to assume that the scores on this test are a reliable indicator of general reading ability[15].

The test was administered four times a year at the beginning and end of each semester. The same test was used four times. The order of multiple choices in each section of the test, however, was changed each time. The question and answer sheets were collected each time, there was a long interval between tests and further no advance notice was given that the same test would be used. The test scores were analyzed by using a nonparametric statistical analysis since there was only a small number of students and the normality of the data

was not guaranteed[16].

The relationship between the number of access log entries and sum total of the quiz score of each student was investigated to examine if there was a correlation between them. The quizzes were conducted at the beginning of each lesson to examine students' understanding of the previous lesson so that the quiz score was considered to be a measurement for achievement. Access log entries were automatically counted by the LMS when a student logged into the system and used the materials. The frequency of the access log entries was an indicator of how often a student logged into the LMS and used the materials for self-learning.

4. Results and Discussion

Table 1 shows the results of the reading section of the FCE test. The full score of the FCE test was 35. Data for only 17 students were analyzed, as two students had absences on test days. The Friedman test was conducted to identify the overall differences among the four tests and a significant difference was found ($\chi^2 = 15.93$, $p < .01$, $r = .38$). The improvement of students' proficiency level in English was thus confirmed.

To conduct in-depth analysis, the students were divided into two groups based on the result of the 1st FCE score. The cutoff point was 17 ($M = 17.41$, $SD = 3.86$) and the Mann-Whitney U test was applied to evaluate whether there was any significant difference between the two groups. A significant difference was found ($U = 0$, $p < .01$, $r = -.85$) and the two groups were designated group H [high score group ($n = 8$)] and group L [low score group ($n = 9$)] (Table 2).

The Wilcoxon signed-rank test was used to analyze the difference between the 1st FCE and the 4th FCE results in each group. A significant difference was found in group L ($T = 1$, $p < .01$, $r = -.61$), but not in the group H ($T = 3$, $p > .05$, $r = -.47$) (Tables 3 & 4).

In addition, the Mann-Whitney U test was applied to evaluate whether there was any significant difference between the two groups in the 4th FCE results. No significant difference was found ($U = 22$, $p > .05$, $r = -.33$).

With the results of the analyses, it is thus possible to argue that there was a significant difference between groups L and H on the score of the 1st FCE test, and the students in group L notably improved their English ability and increased their test scores. As a consequence, the average score of the two groups was close in the 4th

Table 1.   Results of the FCE Tests.

FCE	N	M	SD	Min.	Max.	Mdn
1st	17	17.41	3.86	10	24	17
2nd	17	20.82	3.24	13	24	22
3rd	17	22.35	3.92	13	27	23
4th	17	22.94	3.80	14	28	24

$N = 17$.

Table 2.   Grouping of the Students Based on the 1st FCE Score.

Group H/L	St ID	FCE 1st	Rank
H	M02	24	1
H	F16	23	2
H	F03	21	3
H	M04	21	3
H	F04	20	5
H	F05	20	5
H	F07	20	5
H	F10	18	8
L	F11	17	9
L	F02	16	10
L	F12	15	11
L	F14	15	11
L	F15	15	11
L	F01	14	14
L	M03	14	14
L	M01	13	16
L	F09	10	17

$N = 17$. H = high score group. L = low score group. St ID = Student identification data. The students in group L are highlighted.

Table 3. Students' Scores in the Group L on the 1st and the 4th FCE Test.

Group L	St ID	1st FCE score	4th FCE score
L	F11	17	23
L	F02	16	28
L	F12	15	24
L	F14	15	17
L	F15	15	14
L	F01	14	26
L	M03	14	21
L	M01	14	26
L	F09	10	22
	M	14.33	21.78
	SD	1.89	4.05

$N = 17$. L = low score group. St ID = student identification data.

FCE test.

Table 5 shows the sum total of quiz scores and the number of access log entries of each student. To identify

Table 4. Students' Scores in the Group H on the 1st and the 4th FCE Test.

Group H	St ID	1st FCE score	4th FCE score
H	M02	24	24
H	F16	23	22
H	F03	21	27
H	M04	21	24
H	F04	20	24
H	F05	20	26
H	F07	20	19
H	F10	18	28
	M	20.88	24.25
	SD	1.76	2.68

$N=17$. H=high score group. St ID=student identification data.

Table 5. Students' Quiz Scores and Access Logs.

St ID	Quiz score	Access log
F01	109.5	41
F02	128	71
F03	125.5	58
F04	92.5	26
F05	105	18
F07	106.1	42
F09	127.1	56
F10	128.4	24
F11	105	29
F12	115.5	26
F14	87.1	33
F15	70.6	25
F16	120.6	53
M01	52.5	20
M02	98.5	14
M03	78.24	14
M04	96	10

$N=17$.

Table 6. Students' Access Logs and FCE Gain Scores.

Group H/L	St ID	Access log	FCE gain
H	M02	24	0
H	F16	53	−1
H	F03	58	6
H	M04	10	3
H	F04	26	4
H	F05	18	6
H	F07	42	−1
H	F10	24	10
L	F11	29	6
L	F02	71	12
L	F12	26	9
L	F14	33	2
L	F15	25	−1
L	F01	41	12
L	M03	14	7
L	M01	20	8
L	F09	56	12

$N=17$. The students in group L are highlighted. The FCE gain score was calculated by subtracting the 1st FCE score from the 4th FCE score.

log entries and the raw gain scores was found ($r_s=.59$, $r^2=.35$).

Further research needs to be conducted to identify factors that might contribute to the notable improvement of proficiency of the students in group L. However, learning behaviors that have been observed among students since the "cyclic model of learning" was put into practice may help understand students' performance in group L. For example, students started to print out learning materials from the web page site in preparation for the lessons, and to come and study before lessons started. Additionally, a learning group was voluntarily organized and it conducted regular meetings beyond in-class lessons. There were a number of students who visited the TA's office and sent him e-mails to ask questions.

From these observation records, it might be possible to maintain that these affirmative students' learning behaviors helped create an environment and relationship that facilitated students' self-learning and supported cumulative learning efforts among students. Especially for the students in group L, such a learning environment and relationship seemed to play important roles to sustain learning and to form a learning cycle along with in-class lessons.

In this study, however, the improvement of the students in group H was not apparent statistically. A few

the correlation between two sets of variables, the Spearman rank-correlation was used, and the results indicated that there was a relatively strong relationship between them ($r_s=.61$, $r^2=.37$). From this, it is possible to maintain that the number of times learning was done on the LMS might have an influence on the scores of quizzes that represented students' achievement.

Table 6 summarizes the number of the access log entries and the FCE gain scores of each student. The Spearman rank-correlation was again used, and there was only a weak correlation between the two sets of data ($r_s=.14$, $r^2=.02$). However, by omitting the data set on group H and then analyzing group L data in the same way, a relatively strong correlation between the access

students in group H scored minus points in the result of the raw gain of the FCE tests, although they showed similar performances on the number of access log entries and quiz scores to the students in group L. This may be because the ceiling effect or motivational factors influenced students in group H. However, the learning behaviors observed in group L were also observable among the students in group H. Students in group H often played the leading roles in activities and coordinated learning groups.

From the results and discussion above, it is possible maintain that the practice based on the "cyclic model of learning", in which in-class practices and students' outside-class self-learning with the aid of the LMS were integrated, had a positive influence on the improvement of students' English ability in both proficiency and achievement. The key features of the practice that were recognized can be summarized as follows:

1. To integrate in-class lessons and students' outside-class self-learning by means of technology.
2. To provide students with supplementary learning resources for both preparation and consolidation of the lessons.
3. To elicit students' utterances and participation in the lessons.
4. To provide opportunities and materials for reflection on their learning process.
5. To create an environment and a relationship among students which facilitate students' self-learning and collaborative learning.

5. Conclusion

The primary objectives of this study were to put the "cyclic model of learning" into practice by means of the LMS for foreign language teaching/learning and to examine how the practice based on the "cyclic model of learning" influenced the improvement of students' English ability in both proficiency and achievement. Through a series of statistical analyses, the practicability of the practice based on the "cyclic model of learning" was tested. As a result, notable improvement of students' English proficiency especially in one group was identified and practicability of the practice was confirmed statistically.

However, the present study had several limitations,

which made the conclusions drawn from it tentative rather than definitive. Firstly, the participants' English level was relatively high and the number of students was small. In future studies, the model should be applied to students whose English abilities are varied. Also, it should be applied to a variety of class sizes. Secondly, the weblog counting system needs to be upgraded. The recorded weblogs on the system in the present study just told the number of times students logged in. Thus it was not possible to see how students were learning on the LMS. Finally, a comparative study with experimental and control groups needs to be conducted although it is extremely difficult to do so in educational institutions due to ethical reasons.

Despite the limitations mentioned above, the practice based on the "cyclic model of learning" contributed to the improvement of students' English ability in both proficiency and achievement, and it can indicate a way to respond to the changes in CALL research and practices.

References
(1) Kern, R.: "Restructuring classroom interaction with networked computers: Effects on quantity and characteristics of language production", The Modern Language Journal, Vol. 79, pp. 457–476 (1995).
(2) Levy, M.: Computer-assisted language learning: Context and conceptualization, Oxford University Press, Oxford (1997).
(3) Chapelle, C. A.: Computer applications in second language acquisition: Foundations for teaching, testing and research, Cambridge University Press, Cambridge (2001).
(4) Warschauer, M. and Healey, D.: "Computers and language learning: An overview", Language Teaching, Vol. 31, pp. 57–71 (1998).
(5) Bax, S.: "CALL: Past, present and future", System, Vol. 31, pp. 13–28 (2003).
(6) Taylor, R. P. and Gisaki, C.: "Teaching WELL in a computerless classroom", Computer Assisted Language Learning, Vol. 16, No. 4, pp. 275–294 (2003).
(7) Sumi, S., Takeuchi, O., Yamamoto, E. and Nabei, T.: "From

CALL to LMDS: Introducing a new perspective on the use of OSS in foreign language teaching/learning", Computers & Education, Vol. 19, pp. 19–24 (2005).

(8) Lee, K. W.: "Energizing the ESL/EFL classroom through Internet activities", The Internet TESL Journal, Vol. 6, No. 4, pp. 1–4 (2000).

(9) Kung, S. C. and Chuo, T. W.: "Students' perceptions of English learning through ESL/EFL websites", TESL-EJ, Vol. 6, No. 1, pp. 1–14 (2002).

(10) van Deusen-School, N., Frei, C. and Dixon, E.: "Coconstructing learning: The dynamic nature of foreign language pedagogy in a CMC environment", CALICO Journal, Vol. 22 No. 3, pp. 657–678 (2005).

(11) van Lier, L.: Interaction in the language curriculum: Awareness, autonomy & authenticity, Longman, London (1996).

(12) Takeuchi, O.: "Autonomy and self-learning: Necessities and methods", Teaching English Now, Vol. 8, pp. 2–5. Sanseido, Tokyo (2007).

(13) Fuyuki, M., Tsuji, M., Ueki, Y., Arakawa, M. and Kitamura, Y.: "Development of the web-based coordinated education activation system (CEAS)", Transactions of Japanese Society for Information and System in Education, Vol. 21, No. 4, pp. 343–354 (2004).

(14) Dörnyei, Z.: Research methods in applied linguistics, Oxford University, Oxford (2007).

(15) Chalhoud-Deville, M. and Turner, C. E.: "What to look for in ESL admission tests: Cambridge certificate exams, IELTS, and TOEFL", System, Vol. 28, pp. 523–539 (2000).

(16) Siegel, S.: Nonparametric statistics for the behavioral sciences, McGraw-Hill, New York (1956).

Seijiro Sumi, is a Full-time Lecturer at Himeji Dokkyo University. He received MA degree from Tokyo Metropolitan University. He is currently interested in the integrative application of digital media to language teaching/learning.

Osamu Takeuchi, Ph. D., is professor of applied linguistics at Kansai University. He directs MA and Ph. D. programs in language teaching. His research interests include learning strategies and the application of technology to language teaching.