Chapter 5
Aoyama Gakuin University Case Study: Blended Learning and Flipped Classrooms Utilizing Mobile Devices

Abstract The third and last case study examines blended and flipped classrooms utilizing mobile devices in teaching EFL in Japan. M-Learning can offer a rich, motivating, informal, contextual, and ubiquitous learning environment, where students control their learning time, environment, and pace. Third-year economics majors were given iPads, with e-books integrated into the curriculum. Three empirical studies examined the effectiveness of blended and flipped learning with various emerging technologies from voice recognition to Web-based applications accessed by iPads and smartphones. Results of computer assessment tests such as the CASEC, OPIc speaking test, and TOEIC indicated that blended and flipped lessons helped students to improve their overall English proficiency better than traditional approaches.

Institutional/Pedagogical Context

Historical Background/Pedagogical Aims

Aoyama Gakuin University (AGU) is a Japanese Christian university in Shibuya Ward, Tokyo. AGU is part of Aoyama Gakuin, which includes a kindergarten, an elementary school, junior and senior high schools, and a women's junior college. It was founded in 1874 by Methodist Episcopal missionaries from the United States. Higher education began in 1949 when Aoyama Gakuin College was established. Today, AGU is one of the most prestigious private universities in Japan. It is active in international exchange programs for students and faculty. Few universities in Japan are known for having such a cosmopolitan atmosphere as well as a prized location, with its main campus in a fashionable and trend-setting district of Tokyo. AGU is a mission school with a pedagogical focus mainly on liberal arts education.

Profile of Students/Majors/Curriculum

Students all live off campus, attending mostly from Tokyo and its surrounding prefectures. Besides the main campus in central Tokyo, the Sagamihara Campus in Kanagawa Prefecture is where freshmen and sophomores study, and a College of Science and Engineering is also located there. The total undergraduate student population at AGU is about 20,000, with about 1300 full-time faculty members and part-time teachers. Undergraduate and graduate programs include literature, law, economics, and business; international majors such as politics, economics, and communication; science, engineering, cultural and creative studies, among others. Graduate programs also include professional training in international management, accounting, a law school, and other specializations.

Technological Context

Campus IT Infrastructure

AGU has a Foreign Language Laboratory for IT infrastructure maintenance, student support, supplementary learning materials (such as videos), and faculty support. The faculty member in charge also leads a committee to handle the IT budget and acquisitions, priorities for upgrading infrastructure, and technical training for faculty and management staff. AGU aims for a full range of servers and software learning solutions. The CHIeru learning management system (LMS) and Courser Power LMS have long been used for blended classes, also open source content management systems for providing various teaching materials including BBC news. AGU has 16 fully equipped language laboratories at the Shibuya (Tokyo) campus, and six open learning laboratories at the Sagamihara campus to support foreign language learning.

Furthermore, AGU has been using the LMS Cyber Campus System (CCS) since 2010 to promote e-Learning and m-Learning. The AGU Human Innovation Research Center (HIRC) is now playing an important role in many projects in this field. The HIRC mobile learning project has published many articles related to e-Learning and m-Learning in the field of English language teaching and has had a great impact at AGU on the pedagogy of EFL teaching methods.

Hardware/Devices Available

Besides Windows and Macintosh computers being widely available for classes or independent study, AGU has pioneered mobile learning in the broad sense that includes all handheld or portable devices. From April 2003, several projects have

been conducted toward the integration of e-Learning and m-Learning to enhance language learning. The CHIeru, CaLabo EX, and CALL system, widely used in Japan, has served as the main platform for these initiatives to help students learn foreign languages more efficiently by integrating mobile technologies.

Nearly, 100 % of students are now using smartphones and, as of this wring, 30 % of students are using tablets for learning English. Among 45 students in Obari's seminar class, all of them utilized iPads and smartphones in order to learn English and international affairs. In 2014, students started subscribing to the Asahi Digital Newspaper for language learning and social studies.

Most of the students are very familiar with making digital storytelling projects and PowerPoint presentations, while using partly online e-books as textbooks, such as Oxford *Lecture Ready 1* and *2* (Sarosy and Sherak 2013a, b). Students are highly engaged in active learning and project-based learning with iPads.

Implementation

Blended Learning and Flipped Classrooms Utilizing Mobile Devices

Theoretical Considerations

Mobile learning technologies are rapidly gaining popularity around the world as an effective way to enhance foreign language education. Mobile (m)-Learning is highly motivating to learners, as it offers them a rich, informal, contextual, and ubiquitous learning environment in which it is possible for them to control their learning time, environment, and speed (space and pace). M-Learning has other advantages over conventional teaching and learning methods, including the almost limitless number of English news programs, language learning apps, podcasting (audio series), vodcasting (video shows), and so forth, that can be easily accessible and downloadable for free or for little cost. Today, mobile devices are omnipresent. Recent innovations in technology that brought the advent of social media, such as Facebook and Twitter, to such popularity can be experienced smoothly with handheld devices. Voice over Internet Protocol (VOIP) technology is no longer tied to the desktop or laptop computer. Credit card purchases and other transactions are now commonly performed with mobile devices. However, what is being used so easily and by so many today in society can it be altered, borrowed, copied, or transformed to serve as an effective tool in an educational setting? That is one question addressed in this chapter.

In the field of second language learning (L2), and in computer-assisted language learning (CALL) in particular, there has been an increasing body of research dedicated to the use of mobile devices in language learning in recent years. More technologically oriented teachers and researchers use the term mobile-assisted language learning (MALL) readily as an extension of CALL, as if the term is

familiar to everyone in the L2 field. Regarding the roots of MALL and its place in language learning, see Stockwell (2012b) for a detailed discussion. Our purpose here as educators is rather to try and determine whether mobile-assisted learning holds benefits for our students, to see how and why students come to use this technology, and how mobile learning compares with more traditional classroom approaches.

Gardner (2007), in a study pertaining to language learning in Spain, revisits his construct of the socio-educational model first proposed in 1985, which emphasizes integrativeness—how well a student wants to interact with members of another culture—and his or her attitude toward a learning situation as being the keys to successful language learning. Ryan and Deci (2000) return to their earlier Self-Determination Theory and further theorize on motivations, intrinsic and extrinsic, claiming that autonomy plays a large role in the former, while with extrinsic motivation, attitudes toward the teacher, methodology, and the learning environment are factors that promote or inhibit motivation. Further, they assert that, over time, intrinsic motivation fades, while internalization and integration of values and regulation of behaviors in extrinsically motivated learners lead to successful language learning.

Dörnyei (2010) weighs in with his own ideas on the role of motivation in language learning when he proposes the concept of the Ideal Self. Here he suggests that integrativeness, as proposed by Gardner (see above), be reinterpreted, and he provides the results of empirical studies in Hungary as justification. Furthermore, he claims that the traditional theory of instrumental motivation should be rethought and suggests that a learner's attitude to the L2 learning environment be considered as another key factor in determining motivation. As can be seen here, there has been a merger (or at least a meeting) of distinct disciplines, second language learning theory and psychology. But, Dörnyei (2009) takes this one step further when he brings evidence to bear from neuropsychological research, which would take extra study for most language teachers to confirm the new findings that emerge.

The final area of study that will be addressed here is perceptions of learning. Much has been written about how CALL stacks up with more traditional classroom approaches; see in particular Levy (1997) and Stockwell (2012a), both of whom give exhaustive coverage to this important area but in different eras. The literature on learning using mobile devices and student reactions—other than criticism as it pertains to the devices' limitations, size and thus readability (see Chinnery 2006)— is still rather limited, as publications to date tend to describe the types of devices used, e.g., PDAs, cell phones, etc., and outcomes expected. See Kukulska-Hulme and Shield (2008) for an investigation into collaborative learning regarding listening and speaking activities, and Stockwell (2008) for a study focusing on vocabulary. One earlier study of interest regarding types of activities on various mobile devices and student reaction perceptions can be found in Thornton and Houser (2005). Fujimoto (2013) recently reported on Australian students' mobile device ownership and usage patterns, while Miangah and Nezarat (2012) report on employing mobile devices in Iran as a means of cutting costs and overcoming immobile limitations of CALL.

e-Mobile or m-Learning technologies such as the iPhone or iPad, with Internet affordances such as podcasting, videocasting, and more, are rapidly gaining popularity as an effective means to improve foreign language skills around the world. Mobile learning is highly motivating to learners, as it offers them a rich, informal, contextual, and ubiquitous learning environment. Users can control the time, pace, and speed of their own learning, which is motivating and liberating for many learners. M-Learning can also be more personalized than other methods of computerized instruction, as mobile devices can be more easily customized, resulting in the creation of an emotional bond between the user and machine (Sherimon et al. 2011).

M-Learning has indeed emerged as the next generation of e-Learning. One of the reasons for this has been the high availability of mobile devices worldwide. For example, nearly 100 % of Japanese own a mobile phone, with the number of smartphone users in Japan rapidly increasing (Obari et al. 2010). The smaller screen size and touch interface of smartphones and tablets also lead to more focused learning, as the learner typically has running in the background just a single program at any given time, as opposed to the more common multitasking operations found on desktop and notebook PCs (Gualtieri 2011).

The use of mobile technologies for language learning has numerous advantages over other methods, for example, the countless number of English news programs, language learning apps, podcasts, and videos that are easily accessible and free or reasonably priced. Web-based resources using Web 2.0 tools and mobile computing technologies can be integrated to promote collaborative learning activities.

Blended Learning

According to Vinu et al. (2011), mobile technologies have succeeded in transforming learning methodologies. One such methodology that has received great attention in recent years is blended learning (BL). BL combines traditional face-to-face classroom methods with computer-mediated activities, resulting in a more integrated approach for both instructors and learners (Singh and Reed 2001).

(1) Blended learning (BL) prevents learner isolation and reduces the number of dropouts.
(2) Stanford University has reported success in raising students' self-paced course completion rate from a little over 50–94 % by incorporating the elements of BL through the scheduling of live events, facilitating interaction between instructors and peers, and providing mentoring experiences (Singh and Reed 2001).
(3) A blended learning best practice survey conducted by the eLearning Guild (2003) revealed that 73.6 % of respondents reported BL to be more effective than non-blended approaches (as quoted in Wilson and Smilanich 2005, p. 15).

Blended learning (BL) can increase the options for greater quality and quantity of interaction in a learning environment. Mobile devices and social media are a key

to the next generation of educational instruction. Digital content has been experiencing a great transformation in its form and volume as mobile technologies and social media continue to spread widely. The Internet has become a vast potential learning platform in itself. By accessing digital contents or through connecting with other people through the Internet, users can acquire deeper as well as wider knowledge about various subjects.

Social learning, a style of learning reinvigorated by social media, is expected to be afford many new applications to learning through the Internet, particularly as the word can spread rapidly about Open Educational Resources (OER). Social learning makes it possible to share insights and connect the knowledge of all learners in an online community. OpenCourseWare (OCW) can also provide more accessible platforms for learning communities. Social learning (Bandura 1977) connects learners with other learners, which can now be accomplished effectively through social media and mobile devices such as smartphones and tablet PCs.

Having a consistently available time and place for learning, particularly where classmates can socialize and receive encouragement, advice, and feedback from a knowledgeable teacher, fulfills important conditions for learning, by building self-confidence and motivation. According to social constructionism, people create new knowledge and learn most effectively through social interaction and exchanging information for mutual benefit. Constructionism also holds that learning can happen most effectively when people are active in making tangible objects in the real world. In this sense, constructionism is connected with experiential learning and builds upon the ideas of Jean Piaget (Burr 1995, 2003).

Mobile Learning Initiatives/Innovations

The goal of this chapter is to show the effectiveness of blended learning and flipped classroom activities using mobile devices for the purpose of improving the English language proficiency of Japanese undergraduates, including their writing, oral communication, presentation skills, and improvements in TOEIC scores. First, the blended learning technologies, activities, and assessments are presented, so the Method Section refers just to the blended learning experiments. After discussing the different assessments of the blended learning results, two flipped classroom projects are summarized. Since flipped classrooms are a form of blended learning, some technological, theoretical, and methodological considerations of the blended learning sections presented next may be subsumed into the more concise sections to follow on flipped classrooms.

Method

The university had formerly administered TOEFL tests to all first-year students, as of several years ago. However, no significant difference was found between pretests

upon entry and posttests. For instance, the average TOEFL score among 500 economics majors was 430 in April of 2011 and then 427 in January of 2012. Core first-year English classes consisted of Fundamental English, taught by native English teachers; Writing and Communication, taught by Japanese English teachers, and Reading, taught by Japanese English teachers. These two English courses taught by Japanese English teachers were taught mainly in Japanese. Spurred by the disappointing results of the TOEFL posttest average scores, the blended and flipped learning program was introduced in 2013, in order to improve English proficiency among economics majors. Obari has carried out several empirical case studies since 2013, some of which are introduced in this section as follows:

The blended learning study was conducted over a period of 9 months during two academic semesters (April 2013 to December 2013). A total of 90 undergraduates, all native speakers of Japanese studying at a private university in Tokyo, were the participants of the study. The students were administered TOEIC as a pretest in April 2013 and again as a posttest in December 2013, the purpose of which was to ascertain the effectiveness of the blended learning (BL) program.

The research questions targeted in this study were as follows:

Are blended learning (BL) activities using mobile devices useful in improving students' overall English skills?
Can online TED Talks and the ATR CALL BRIX program help to improve the TOEIC scores of native Japanese students of EFL?
Can Globalvoice CALL helps to improve the English pronunciation of Japanese EFL students in terms of words and prosody?
Can the online Newton m-Learning program helps to improve the TOEIC scores of native Japanese students of EFL?

The blended learning activities included the following: (1) students watching online TED talks with the use of PC or mobile devices, (2) students spending extensive time watching TED Talks during their commuting hours and writing a 300-word summary of each lecture each week, (3) students presenting oral summaries of the TED talks to their classmates both face-to-face and in front of the class, (4) students using Globalvoice CALL software for TED talk summaries to brush up on their English pronunciation and prosody before presentations, (5) students using the online Newton m-Learning program by PC or mobile devices during their free time, and (6) students using the online ATR CALL BRIX program to improve their English proficiency and TOEIC scores in the classroom and during their free time with the use of PCs and mobile devices.

At the end of the course, a questionnaire was administered to students after their exposure to the above activities for the purpose of ascertaining their impressions of the BL activities.

To introduce the technologies utilized, TED Talks are widely considered useful online learning resources for multidisciplinary content of contemporary relevance, and are conducive to m-Learning, whereby learning can take place at any time and any place, provided robust mobile technologies are available to learners. Newton

m-Learning, the ATR CALL BRIX program, and Globalvoice CALL are among the other useful online learning resources available that the following aims to show are consistent with the above theoretical considerations and thus conducive to m-Learning.

TED Talks

TED is a foundation that, for the purposes of this book, makes professional quality presentations in many fields available freely from its Web site http://www.ted.com or through various platforms including YouTube, podcasts, television, radio, and, significantly for the purposes of this chapter, mobile apps for smartphones, tablets, and other devices that can play digital videos. TED talks utilized for educational purposes typically feature innovative research presented concisely in less than 18 min, and made as interesting as possible with various media and appeals to human interest. Thus, TED talks can serve as a relatively painless way for learners to explore a wide range of fields. For nonnative English users at intermediate or advanced levels in listening comprehension, the recorded videos available online allow to control the experience such as repeated viewing and access to talks on the go with mobile apps.

Globalvoice CALL Software

How can Japanese EFL learners learn to speak more intelligible English for international communication? There exist many factors in evaluating nonnative speakers of English. Rhythmic accent and pauses are considered more important than segmental features in English utterances to make speech intelligible. In this regard, prosodic features such as intonation and the rhythm of the language are crucial to comprehensible speech.

One of the main goals of English education in Japan is to help Japanese speak English intelligibly, so they can be more clearly understood while taking part in international communication. Several parameters such as speech duration, speech power, F0 (pitch), and the ratio of vowel and consonant length are all introduced to determine how much Japanese students can improve their English pronunciation and overall proficiency by using Globalvoice CALL (Obari 2013) software (pictured in Figs. 5.1 and 5.2).

Globalvoice CALL is software into which students input any words or sentences to practice their pronunciation via specialized speech training. This software can enable Japanese students to correct their pronunciation by helping them improve their prosodic and segmental features. About 84 % of 150 Japanese EFL students who used this software reported that it would be very useful for practicing English pronunciation and prosody.
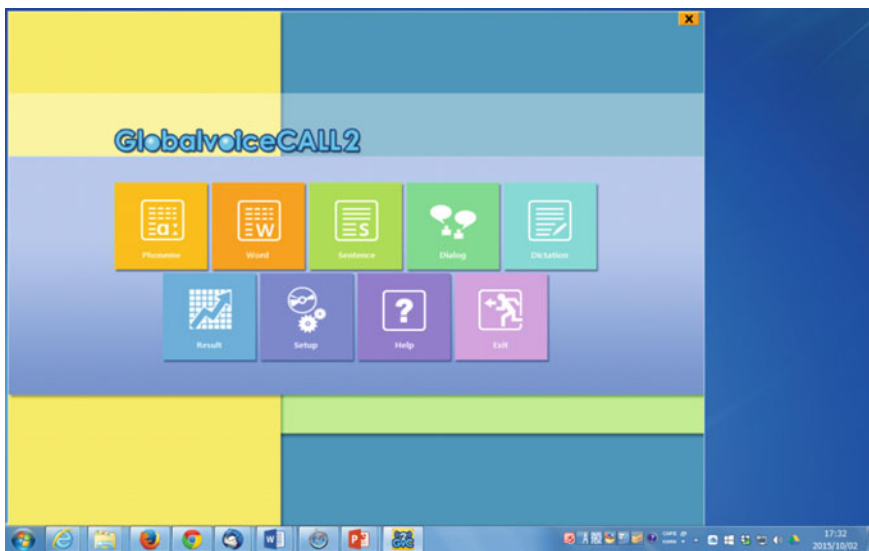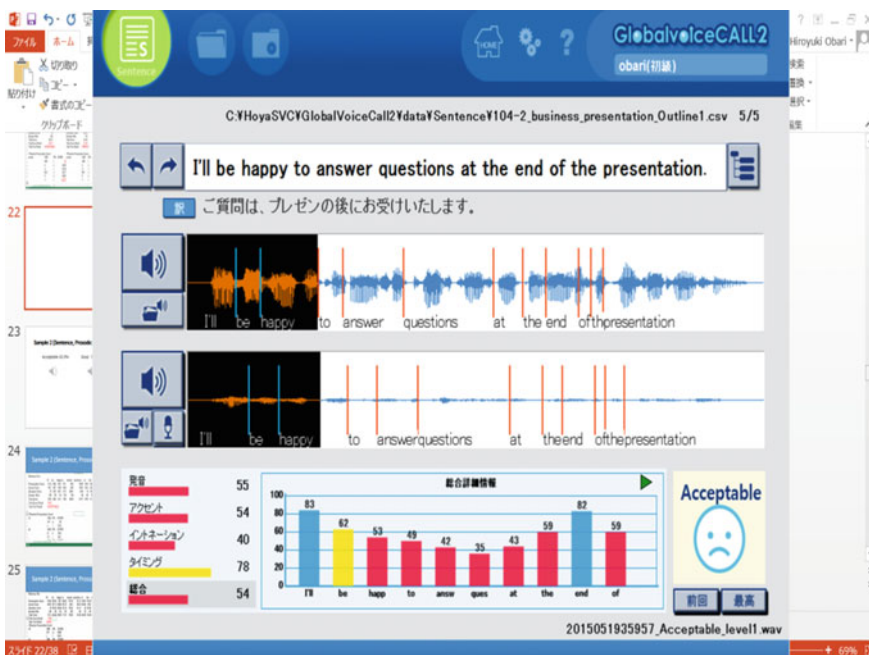
Fig. 5.1 Display of the Globalvoice CALL software

Fig. 5.2 Display of English phonemes

ATR CALL BRIX Program

ATR CALL BRIX is an English e-Learning system which was developed by the Advanced Telecommunication Research Institution (ATR) and expanded by Uchida Yoko Co., Ltd. mainly into Japanese higher education institutions and companies. This is a client server system to provide English learning contents by using Internet Explorer®. Most of its system administrators allow students or employees to access the server from outside of their Intranet to offer them a ubiquitous learning environment. Through a sequence of experiments by ATR, a bottom-up method was developed as an efficient way to learn English for Japanese people. This method was adopted for the ATR CALL BRIX for basic English skill training. For instance, a learner starts training by listening to a minimal pair contrast exercise, and then moves onto the next step of counting syllables of English words. For this basic skill training, a database of 15,000 English words had been made as well, including sample speech from over 30 native speakers of American English. Every item contains distractors for efficient vocabulary building (Obari et al. 2013a, b).

The ATR CALL BRIX also offers the TOEIC® Test Official Training Course which includes the official TOEIC contents offered by ETS, a nonprofit organization which develops and provides various academic assessments. In Japan, TOEIC® has in recent years become the most common assessment test to measure business English communication skills. According to public data of The Institute for International Business Communication (IIBC) which provides the TOEIC test in Japan, 2,312,000 people took the test in 2012. This course is designed not only for practice tests to get higher scores on the real TOEIC® tests. It includes vocabulary development, shadowing practice, and dictation exercises with qualified TOEIC official contents in order to build up and improve English skills. ATR CALL BRIX is thus an e-Learning system which helps learners enhance their English skills with its course for basic skill training as well as a TOEIC test preparation course for accessing a server from smartphones and tablet devices to provide learners with a more ubiquitous learning environment (Obari et al. 2013a, b).

Newton m-Learning Program

Newton m-Learning TLT (testing, learning, training) software is a form of Web-Based Training (WBT) developed for e-Learning in academic settings. Individual learners are able to ubiquitously review their studies anytime, anywhere. Teachers are also able to uniformly manage the progress and results of students' research studies. As a result, this software can be employed for assignments in everyday classes apart from CALL and PC labs, as it is conducive for learning regardless of the time or place when used with tablet PCs or smartphones, and claims the potential for improvements over traditional study modalities. The convenience of the software stems from the fact that the educational TLT software materials are an Internet-based form of m-Learning, and are predominantly drill based, problem exercise materials (Obari et al. 2013a, b).

First, the program extracts the necessary contents on the basis of each student's records in order to present them with their targeted assignments. Then, the students' tests, learning, and teaching are all repeated automatically, and their records are accumulated in reiterations of the learning cycle until they become proficient. The overall systems are called "TLT Software" and are the only computerized educational materials to have acquired patents in Japan and US (domestic patent No. 3820421, US patent No. 5888071). The following three functionalities form the backbone of these patents:

(1) Staged learning functionality: control of learning in three steps: Testing, Learning, and Training (forming the initials for TLT).
(2) Automatic learning functionality: automatically executes weak point extraction/repeat learning.
(3) Automatic decision functionality: automatically determines true/false answers with the first sound character for an answer (one-touch input).

Furthermore, the systems control problem arrangement, question order, and step progression in the materials on the basis of these functions it has been patented in both the US and Japan.

Newton e-Learning materials for the TOEIC test enable studying commensurate with every proficiency stage possible, from beginner to mastery. Moreover, it contains a total of over 24,000 learning challenges. Overall, they are composed of two courses (A and B), each with the aim of improving TOEIC Bridge and TOEIC test scores. Also, both A and B courses are comprised of two Exercise Materials and Test Material types: A. The Exercise Materials include four sections: Problems, Basics, Dictation, and Vocabulary Training types, with exercises being presented in separate parts, B. The Test Materials provide fixed Web Test A/B tests (8 total times), and short Web Test A/B by Part tests (20 total times).

Use of the teaching materials management functions allows one to view the progress of students both individually and as a group, to have a grasp of their learning status, to make changes to various settings, and to download data. Moreover, interactive functionality can be exploited as well. Since 2012, Newton e-Learning has been supporting not only Windows XP, Vista, 7 and 8 (Internet Explorer 7 or above), but also Macintosh (Mac OS X 10.4–10.8 with Safari 4, 5 and 6), the iPad (Mobile Safari), and smartphones for wider learning settings (Obari et al. 2013a, b).

Assessment of the Blended Learning Activities

To assess the results, a sampling of the data is summarized and interpreted in the following sections, including the results from TOEIC tests, which revealed that the students' overall English proficiency had improved after their exposure to the BL activities. Also included are some of the results of the survey administered to students for the purpose of attaining feedback on how they felt about using the BL activities to practice their English language skills.

TOEIC Test Results

The TOEIC results revealed that the mean scores significantly increased from 570 (SD = 102) in the pretest to 687 (SD = 108) in the posttest for the 3rd year students, and increased from 382 (SD = 102) to 573 (SD = 120) for the 1st year students. The TOEIC pre and posttest results were analyzed using a t-test, indicating that the difference between pre and posttest scores of both student classes were statistically significant at a 1 % level. The improvement in scores would seem to indicate that the utilization of a learning environment integrating a BL environment with m-Learning helped the students to improve their overall English proficiency.

Questionnaire

A survey was administered to the participants after being exposed to the blended-learning program incorporating TED Talks and the use of emerging technologies. In response to the survey question, "Did you find the TED Talks useful in improving your English proficiency?," 91 % of 90 students felt that the online lectures were very useful. In response to similar survey questions about the ATR CALL BRIX program and Newton m-Learning program, 89 and 76 %, respectively, felt that they were very effective and useful. And in response to the question, "To what extent did you use mobile technologies to learn online TED talks and Newton m-Learning program?," 30 % of students responded that they had used their mobile devices in those ways to study English online.

Assessment of English Writing, Oral Summaries, and English Pronunciation

At the start of the semester, the students made numerous grammatical and structural mistakes in their summary writings of TED Talks. However, by the end of term their English writings for the most part had fewer grammatical errors, were better organized, and were longer in duration. In addition, by comparing the first and final oral summaries, many of the students demonstrated significant improvements in their oral skills, particularly in terms of segmental and prosodic features, including pitch, intonation, accent, timing, and vowel duration because of the use of Globalvoice CALL software.

Flipped Classroom Project 1

As a reversal to traditional learning, the flipped classroom is a new educational environment which is quickly gaining in popularity among educators around the

world. In a flipped classroom, students learn the course lectures and content from online videos, materials, and other learning tools before coming to class, and spend a bulk of their classroom time asking questions and being engaged in interactive discussions.

The study was carried out from April 2014 to January 2015 at Aoyama Gakuin University in Tokyo, Japan, and targeted 60 first-year undergraduate students to evaluate the effectiveness of a flipped classroom compared to a traditional classroom learning environment. The experimental group was exposed to flipped lessons for 24 weeks using the Oxford University Press hybrid e-book English textbook *Lecture Ready 1* (Sarosy and Sherak 2013a). The students were required to watch the course video lectures and online English learning materials using mobile technologies before coming to each class, and then created PPT slides for classroom presentations and discussions. The students shared their presentations and interacted with each other during the regular classes. A control group of students was taught using traditional methods with the paper textbook *Lecture Ready 1*, but with no flipped lesson contents. The control students also watched the video lectures and answered the textbook questions, but only during regular classroom periods, including discussions among themselves during the 24-week period.

An assessment of pretreatment and posttreatment TOEIC scores showed that the students exposed to the flipped lessons improved from 474 (SD 111) to 649 (SD 96), which was greater than that of the control group students, who improved from 484 (SD 123) to 617 (SD 115). By the end of the eight-month training period, the experimental group students had completed 80 % of the course contents and substantially improved their overall reading, listening, and oral communication skills through the online English lectures with flipped lessons.

Flipped Classroom Project 2

The second study was conducted over a 10 month period during two academic semesters (April 2014 to January 2015). A total of 25 undergraduates were the participants of the study. All of the participants were native speakers of Japanese studying at a private university in Tokyo. The students were administered TOEIC as a pretest in April 2014 and again as a posttest in January 2015. The purpose of this was to serve as a measurement to help determine if the students' scores would improve as a result their exposure to the BL and flipped classroom activities, and thereby help ascertain the effectiveness of the lessons. The research questions of this study were as follows:

(1) Are blended learning (BL) activities using mobile devices beneficial in improving Japanese EFL students' English proficiency?

(2) Are flipped classroom activities using Lecture Ready 2 and the ATR CALL
     Brix program with a tablet or smartphone useful for improving the TOEIC
     scores of Japanese EFL students?
(3) Can Globalvoice CALL helps to improve the English pronunciation skills of
     Japanese EFL students in terms of prosodic and segmental features?

The blended and flipped learning activities of this study included the following:
(1) students watched the online digital textbook *Lecture Ready 2* (Sarosy and
Sherak 2013b). using a PC and with their mobile devices; (2) students spent
extensive time watching the lectures with the support of COOORI (Web-based
language learning software downloadable from iTunes) during their commuting
hours and later wrote a 300-word summary of one lecture per week; (3) students
created PowerPoint presentations and presented oral summaries of the e-textbook
lectures to their classmates both face-to-face and in front of the entire class;
(4) students used Globalvoice CALL software along with their *Lecture Ready 2*
summaries to attempt to improve their English pronunciation in terms of segmental
and prosodic features before their presentations; (5) students used the online pro-
gram Newton m-Learning with the use of a PC and mobile device during their free
time; and (6) students used the online program ATR CALL Brix to improve their
TOEIC scores and overall English proficiency in and out of the classroom during
their free time with the use of a PC and mobile device. At the end of the course, a
questionnaire was administered to the students after their exposure to the above
training activities.

It can be seen from the above list of activities, when compared with the previous
study of blended learning (BL) that the flipped classroom represents an attempt at
the fullest realization of the potential of BL.

Assessment of the Blended and Flipped Learning Activities

A sampling of the data results is presented below, including the results from TOEIC
tests, which revealed that the students' overall English proficiency had improved
after their exposure to the blended and flipped learning activities. Also included are
some of the results of the survey administered to students for the purpose of
attaining feedback on how they felt about all the activities. Twenty-five students
took the OPIc computer speaking test a total of twice (in April 2014 and again in
January 2015) to measure their oral proficiency.

TOEIC Test Results

The TOEIC results revealed that the mean scores increased from a mean TOEIC
score of 577 (SD: 132) to a mean score of 758 (SD: 105), which would seem to
indicate that the students improved their overall English proficiency. TOEIC pre

and posttest results were analyzed using a t-test, indicating that the difference between pre and posttest scores of both classes were statistically significant at a 1 % level.

OPIc Computer Speaking Test

An increase of roughly 24 % in the OPIc speaking test was observed between the pretest and posttest. This improvement would seem to indicate that the utilization of a learning environment of blended and flipped lessons did help the students to improve their overall English proficiency (cf. Fig. 5.3 below).

Questionnaire

A survey was administered to the participants after their exposure to the blended learning lessons incorporating *Lecture Ready 2* and TED Talks through the use of mobile technologies. In response to the survey question, "did you find the digital *Lecture Ready 2* (1) useful in improving your English proficiency?," 91 % of students felt that the online lectures were very useful. In response to the questions "did you find the ATR CALL Brix program (2), Newton m-Learning program (3), and Globalvoice CALL software (4) useful in improving your English proficiency and pronunciation?," the percentage of students responded that they felt they were effective and useful were, respectively, as follows: (2) 82 %, (3) 84 %, and (4) 91 %. Finally, in response to the question "to what extent did you use mobile technologies to study with the online Newton m-Learning program?," 30 % responded that they had used their mobile devices to study the online English programs.

Fig. 5.3 OPIc computerized speaking proficiency test screen shot

Flipped Classroom Project 3

The third study was conducted over a ten-month period during two academic semesters (April 2015 to January 2016). A total of 24 undergraduates were the participants of the study. All of the participants were native speakers of Japanese studying at a private university in Tokyo. The students were administered TOEIC as a pretest in April 2015 and again as a posttest in January 2016. The purpose of this was to serve as a measurement to help determine if the students' scores would improve as a result their exposure to the BL and flipped classroom activities, and thereby help ascertain the effectiveness of the lessons. The research questions of this study were as follows:

(1) Are blended learning (BL) activities using mobile devices beneficial in improving Japanese EFL students' English proficiency?
(2) Are flipped classroom activities using *Lecture Ready 3*, Newton e-Learning TOEIC Practice Kit, and the ATR CALL Brix program with a tablet or smartphone useful for improving the TOEIC scores of Japanese EFL students?
(3) Is blended learning (BL) useful in changing students' worldviews?

The blended and flipped learning activities of this study included the following: (1) students listened to the online digital textbook *Lecture Ready 3* (Sarosy and Sherak 2013c), using a PC and with their mobile devices; (2) students spent extensive time watching the e-textbook lectures with the support of COOORI (Web-based language learning software downloadable from iTunes) during their commuting hours and later wrote a 300-word summary of one lecture per week; (3) students created PowerPoint presentations and presented oral summaries of the e-textbook lectures to their classmates both face to face and in front of the entire class; (4) students read several articles related to worldviews and made PPT presentations; (5) students used the online program Newton m-Learning with a PC and mobile device during their free time; and (6) students used the online program ATR CALL Brix to improve their TOEIC scores and overall English proficiency in and out of the classroom during their free time with the use of a PC and mobile device. At the end of the course, a questionnaire was administered to the students after their exposure to the above training activities.

It can be seen from the above list of activities, when compared with the previous study of blended learning (BL) that the flipped classroom represents an attempt at the fullest realization of the potential of BL.

Assessment of the Blended and Flipped Learning Activities

A sampling of the data results is presented below, including the results from CASEC computerized tests, which revealed that the students' overall English

proficiency had improved after their exposure to the blended and flipped learning activities. Also included are some of the results of the survey administered to students for the purpose of attaining feedback on how they felt about all the activities. Twenty-four students took the OPIc computer speaking test a total of twice (in May 2015 and again in January 2016) to measure their oral proficiency.

CASEC Test Results

The computer-based CASEC Test (cf. http://casec.evidus.com) results revealed that the mean scores increased from a mean score of 626 (SD: 88) to a mean score of 721 (SD: 63), which would seem to indicate that the students improved their overall English proficiency. CASEC pre and posttest results were analyzed using a t-test, indicating that the difference between pre and posttest scores of both classes were statistically significant at a 1 % level.

OPIc Computer Speaking Test

An increase of roughly 20 % in the OPIc speaking test was observed between the pretest and posttest. This improvement would seem to indicate that the utilization of a learning environment of blended and flipped lessons did help the students to improve their overall English proficiency.

Questionnaire

A survey was administered to the participants after their exposure to the blended learning lessons incorporating worldview studies through the use of mobile technologies. In this case study, students were asked to respond to worldview-related questions. Did their world views change after they joined this course? From their essay writings, based upon the pre- and post-questionnaire, most of the responses indicated that their worldviews were more open-minded, starting to see invisible parts of another culture and understanding the concept of worldview presented in several articles from two Oxford scholars concerning ontological and epistemological scientific worldviews. "Language as a worldview" was held to be a very important concept in language learning while students endeavored to improve their English proficiency. Through this seminar, the 24 students improved their English proficiency and expanded their worldviews to be more internationally minded.

Limitations of the Studies

Possible limitations of the blended and flipped learning studies were as follows:

(1) Although students were encouraged to use mobile devices to do the learning activities, for some activities they felt it would be more convenient to use PCs instead of mobile devices. COOORI and Newton e-Learning TOEIC Practice Kit were easily accessed with mobile devices. 100 % mobile use actually was confirmed when tracking how much students logged into study, although the detailed data are not shown in this chapter.

(2) *Lecture Ready 2* (Sarosy and Sherak 2013b) and *Lecture Ready 3* (Sarosy and Sherak 2013c) were available mainly as e-books for iPad. Thus, in most cases students both accessed these materials and prepared their presentations by iPad (see Fig. 5.4 below) to present and discuss among the participants. However, in some cases, they might have used PCs to study some materials. How they learned and what they learned could not be exactly observed while they were actively involved in classroom discussions and presentations.

(3) Precisely what materials students were using with mobile devices or PCs, or their combination, was not completely tracked. Thus, it might be difficult to assert that mobile learning helped students make more progress than would otherwise be the case in improving their English proficiency. It would rather be safer to say that the integration of mobile devices with PCs could enhance learning in flipped and blended environments.

(4) In the case of classroom activities, all the lessons were recorded with camcorders to be preserved on hard disks for three years to further investigate how students were engaged in active learning (cf. Fig. 5.4 below), while, of course, out-of-classroom activities were not observed.

Fig. 5.4 Flipped learning activity: student made presentation by iPad

Conclusion

Mobile m-Learning can be motivating to learners to help improve their foreign language skills, as it offers them a rich, informal, contextual, and ubiquitous learning environment. This case study focused on examining a variety of emerging technologies, from speech recognition to Web-based learning, to help determine the effectiveness of blended learning and flipped classroom activities. Various emerging technologies such as ATR CALL BRIX, a mobile learning-oriented TOEIC Practice program, Course Power, online TED Talks, and other learning materials were utilized, including an empirical study that indicated their effect on improving the TOEIC scores of native Japanese speaking undergraduates.

The first phase of the study targeted approximately 90 Japanese undergraduates who spent approximately 50 total hours to complete an online TOEIC course with flipped classroom learning materials using a PC and mobile technologies for the purpose of enhancing their English proficiency. By the end of the second term, students had completed nearly 100 % of the online course contents and written 90 TED Talk summaries. The students were administered TOEIC as a pretest in April 2013 and as a posttest in December 2013. The results indicated that their mean TOEIC score had improved from 570 (SD 102) to 687 (SD 108) for third-year students during the nine-month period while being exposed to the blended learning environments. After the students were engaged in the flipped classroom lessons with online materials, and had delivered their English presentations while engaging in Digital Storytelling and writing blogs, they exhibited a high level of English writing performance, particularly during the second semester, in terms of their summary writings of the TED Talks. A questionnaire was also administered to the students, which indicated that the students were satisfied by their exposure to the blended learning activities.

An assessment of pre and posttraining TOEIC scores revealed that TED Talks activities, the ATR CALL BRIX program, the Newton m-Learning program, and the use of emerging technologies had a positive effect on the students' overall English skills. In addition, the students' listening and oral communication skills improved as a result of integrating the targeted e-Learning and m-Learning activities. A questionnaire administered after their exposure to the BL activities indicated that the students were satisfied with the variety of online courses mentioned above and motivated by the BL environment incorporating m-Learning. The students' English writing and oral summary skills also improved after their exposure to the online TED talks and the use of Globalvoice CALL software.

With regard to the Flipped Classroom Project 1 and 2, an assessment of pre and posttraining TOEIC and OPIc scores (Project 2) revealed that various types of online materials and activities included in our study had a positive effect on the students' overall English skills. Additionally, the students' listening and oral communication skills improved as a result of integrating blended and flipped learning activities through m-Learning. The questionnaire indicated that they were satisfied with the variety of online course materials and programs and were

motivated by the BL environment incorporating m-Learning. The students' English writing and oral summary skills also improved after their exposure to *Lecture Ready 2* and Globalvoice CALL software.

Overall, these results would seem to indicate that the blended learning using mobile technologies can be effectively integrated into the language learning curriculum and can play a positive role in improving students' language proficiency. Additionally, instructor observations of the BL activities revealed that the students were excited by using a variety of emerging new technologies, which enabled them to effectively learn English by accessing a variety of learning materials from their mobile devices. M-Learning helped to increase the amount of comprehensible English input with the aid of recently developed learning technologies. It was also highly motivating to students by offering them a rich, informal, contextual, and ubiquitous learning environment which enabled them to control their learning opportunities or occasions (time), environment (space), and speed (pace).

Recommendations for Other Institutions

There are now many online e-Learning materials available to teach EFL, so institutions need to choose among them judiciously. The technologies utilized in this study were each found to be effective for e-Learning in a blended or flipped classroom approach. The Newton e-Learning Practice Kit is recommended to improve the TOEIC scores of EFL learners. Students could study those materials entirely using mobile technologies as well. Another software solution recommended is COOORI, which can be directly linked to whichever textbook is used, in order to study vocabulary with the support of artificial intelligence.

In addition, Globalvoice CALL software was found to be well-suited to teaching segmental and prosodic features of English, especially as it allows any words or sentences students make to be processed by the software, so students can practice English pronunciation and prosody. Some software solutions become part of the campus infrastructure and support various classes, which would be more efficient than each teacher ordering software without curriculum integration.

Then there was the example in this and the previous chapter of publisher materials that can be used as paper textbooks or e-books, with audio and video available at a dedicated Web site for purchasers (Sarosy and Sherak 2013a, b). The off-the-shelf approach could be recommended for convenience, especially for universities with limited experience in developing their own materials or finding suitable open educational resources. Speaking of the latter, Aoyama Gakuin University was shown in this chapter to have combined purchased software and e-textbooks with freely available online resources, chiefly TED talks, furthermore leveraging the mobile phones nearly all students carry to aim for ubiquitous m-Learning. The more multifaceted the approach, covering all available devices and media, and the more tightly and seamlessly integrated into the campus-wide infrastructure and curriculum, the more effective the results could be for student learning outcomes.

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