



# Seamless Collaborative Learning Method to Learn Business Japanese with eBook and Chat System

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**Abstract.** The breakthrough of information technology has accelerated the evolutionary change in teaching and learning methodologies. In particular, pervasion of high-efficiency smartphones has raised the potential to generate a new learning environment called seamless learning, which has been drawing much attentions from researchers in pedagogy of any domains.

The Japanese government, in 2016, declared “Japan Revitalization Strategy 2016”. It includes the increasing of the number of foreign workers who gain employment in Japan after graduation. They set the goal from 30% to 50% of the international job hunting students find jobs in Japan. Therefore, career education for international students has become an urgent issue to tackle with in Japan. In fact, many universities in Japan have started providing international students with career education such as business Japanese, business communication and career design. Since Japanese job hunting process is very unique, most foreign students have anxieties about it. The objective of this study is to propose an effective business Japanese learning support system. Our ultimate goal is to contribute to the enhancement of their employment rate in Japan.

**Keywords:** Career support · Digital textbook · Job-hunting · International students · Seamless learning · Collaborative learning · Chat tool

## 1 Introduction

Seamless learning has been recognized as an effective learning approach across various dimensions and domains. Quite a few researchers are exploring to make learning seamless between formal and informal learning, individual and collaborative learning, and physical world and cyberspace [1]. So far, majority of researches in the seamless learning focus on realizing a seamless formal and informal learning [2, 3]. However there is no the researches on challenging to make individual-learning and collaborative

learning seamless. Therefore in our study, the focus was on entwining individual and collaborative learning.

According to Japan Student Services Organization (JASSO), 298,980 foreign students are studying in Japan as of May 1st, 2018 [4]. “Japan Revitalization Strategy 2016” declared by the Japanese government includes the increasing of the number of international workers who got jobs after graduation [5]. They set the goal from 30% to 50% of the international job hunting students who actually find jobs in Japan. Therefore, career support for international students is an urgent issue to tackle with. Job-hunting process is complicated in Japan. It imposes a heavy workload on their academic lives. Students start job-hunting more than 1 year before graduation. They start with writing CVs (curriculum vitae) and entry sheets, taking exams, written or web-based, such as general knowledge tests, aptitude tests, and personality tests, participating group discussion observed by recruiters, and receiving group interviews and individual interviews at the final stage until they finally obtain official job offers. According to the survey conducted by [6], the top two anxieties that international students had about job hunting in Japan were (1) language-related anxieties: writing CVs and entry sheets (writing skill) and job interviews (listening and speaking skills) and (2) an anxiety about how to get information to find a job. There are many terms used in job-hunting processes, which are so rarely used in daily conversation that even advanced learners of Japanese are yet to learn. The survey result also showed that more than half of the questionees selected “I don’t know how to get information”.

The objective in this study is to propose an effective business Japanese learning system to facilitate international students’ job hunting in Japan. The system seamlessly supports individual learning and collaborative learning with SCROLLeBook and a chat system, InCircle. Our research question is:

- (1) whether or not our system contributes to international students’ leaning business Japanese.

The rest of this paper is constructed as follows. Section 2 describes related researches to clearly identifying the difference between related works and our research. Section 3 describes the design of SCROLL eBook and InCircle. Section 4 describes evaluation and our conclusions.

## 2 Related Researches

### 2.1 Seamless Learning Environments

Seamless learning is used to describe the situations where students can learn whenever they want to in variety of scenarios and that they can switch from one scenario to another easily and quickly using one device or more per student as a mediator. Researchers in the seamless learning used mediating tools such as smart phone and PDA to realize a seamless learning environment. For example, Wong et al. [7] reported a seamless learning system called MYCLOUD (My Chinese UbiquitOUS learning Days), which allow students to learn the Chinese language in both in-school and out-of-school learning spaces using mobile devices. MYCLOUD consists of three

components to bridge formal learning and informal learning: mobile dictionary, digital textbook and Social network service. In a formal learning setting, learners use the digital textbooks to highlight unfamiliar vocabularies and the vocabularies will be added to the mobile dictionary. In an informal learning setting, they use the social network service to record the artifacts (photo(s)+sentence(s)) of the experiences in their daily life. The seamless learning environment is realized by linking the vocabularies between the digital textbooks and the social network service.

On the other hand, Uosaki et al. [8] reported a seamless learning system called SMALL (Seamless Mobile-Assisted Language Learning support system) to support students who aimed to learn the English language in a formal and informal setting. SMALL has been developed with newly functions added to SCROLL. In a formal setting, learners use digital textbook to record vocabularies that they want to remember and the vocabularies will be added to the SCROLL database. In an informal setting, learners can record the digital records (a vocabulary with a photo or a video) of their learning experiences in their daily lives. The seamless learning environment is realized by linking the vocabularies between digital textbook and SCROLL. Therefore, in designing seamless learning environments, researchers need to consider how formal and informal learning are linked with use of computer technologies.

However there is no report so far on the researches challenging to make self-learning and collaborative learning seamless. This study, therefore, designed and developed a seamless learning environment by integrating the digital textbook system called SCROLL eBook with a chat system called InCircle. As far, researchers have constructed a seamless learning environment and evaluated whether the seamless learning environment can be enhanced learners' learning efficacy and autonomy learning, while this study considers learning analytics perspective with designing successfully the seamless learning environment because the collected learning logs aren't utilized to support teaching and learning.

## 2.2 Technology Enhanced Career Education

The emergence of IT technologies such as multimedia technology, Internet technology, ubiquitous and mobile technology provoked new learning concepts such as WBL (web based learning), CSCL (computer supported collaborative learning), and MAL (mobile assisted learning) [9]. Besides, various kinds of learning supports have been made into reality by accessing resources of web sites, or by linking learners and numbers of learning objects [10]. However career education using information technology is still in the stage of emergence. There are some reports on ICT implementation to career education such as portal sites for students' career support [11], the use of ePortfolio in career education [12], e-Learning in career development for university students [13], and e-mentoring for career development [14]. But no such learning system using seamless mobile learning technologies to enhance career education for international students has been developed yet.

### 2.3 Self-learning vs. Collaborative Learning

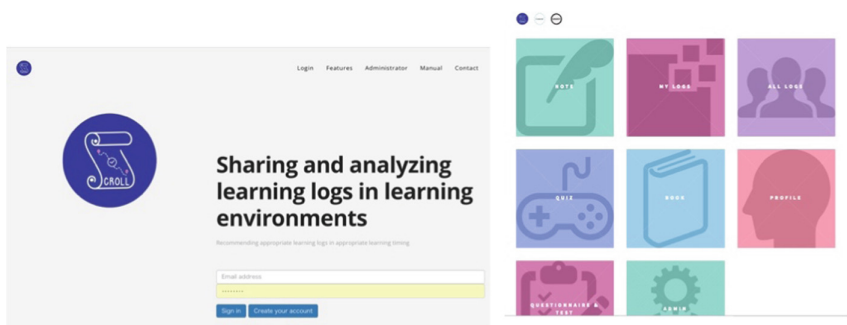
There is a trend in a pedagogical field that there goes the shift from teacher-centered to student-centered learning in any level of education [15]. According to [16], student-centered and small-scale course programmes resulted in more academic success than lecture-based course programme. It is also reported that a student-centered collaborative learning is one of the most effective ways of learning in language class [17]. In fact, most studies investigating the link between the extent to which course programmes are student-centered on the one hand and promote academic success on the other hand, find positive relationships between the two [16].

However, according to the result of the questionnaire conducted in [18], 70% of them preferred learning alone to learning in a group. It should be considered that fact that more than two-third of students preferred individual learning. How can we design the class which could satisfy both students who prefer study alone and those who prefer study in a group? In this study, we challenged the learning scenario to be combined self-learning with group learning seamlessly.

## 3 System Designs

### 3.1 SCROLL eBook

SCROLL [19] stands for System for Capturing and Reusing Of Learning Log, which has been developed since 2010 [20]. SCROLL supports learners to record what they have learned in both informal and formal settings as a log using a web browser and a mobile device and to share them with other learners anytime and anywhere beyond the limits of time and space. This on-going project is still in progress with new functions being added to the system one after the other. SCROLL eBook is one of the functions of SCROLL developed based on EPUB format.



**Fig. 1.** Login interface of SCROLL (left) and SCROLL top page (right).

Figure 1(Left) shows the login interface of SCROLL. Figure 1(right) shows top page of SCROLL. Book icon is the link to eBook system. Figure 2 shows SCROLL eBook contents. Teachers can create e-book contents using PowerPoint or Keynote

prior to the class and use them in their courses. The uploaded e-book contents are converted to EPUB format and it is supported to access the contents by using smartphones and PCs. Figure 1(Right) shows digital textbooks uploaded by the teachers.

Figure 3 shows the eBook viewer interface and its functions. When a learner clicks the highlight button, he/she can highlight the word. he/she can find the page number corresponding to the target word in the e-book by clicking the search button. When a learner clicks the memo button on the digital textbook viewer system, he/she can write a description concerning the target words. In order to facilitate memorization of the target words, the masking function was implemented. When they read the content for the first time, the target terms were masked and by clicking them, the words appear (Fig. 4).

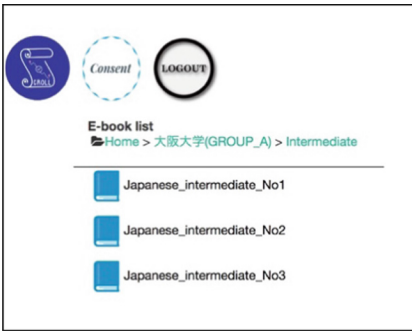


Fig. 2. SCROLL eBook contents

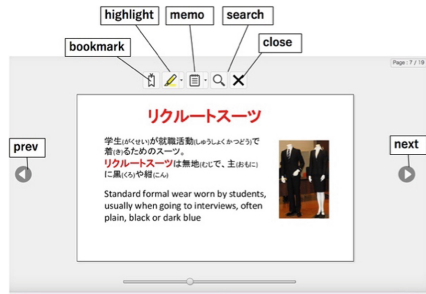


Fig. 3. SCROLL eBook viewer interface

### 3.2 InCircle

InCircle [21] is a product developed by AOS Mobile Inc., Tokyo, Japan [22] with the fifth author joining this project as a chief software architect. It is a client-server application. The server side runs on Linux OS and Windows Server. The client side is working on iOS, Android, and PC Web browser. Chat messages are transmitted and received through the network (Fig. 5).

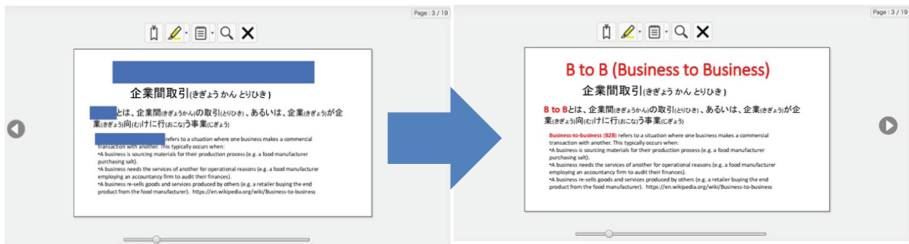
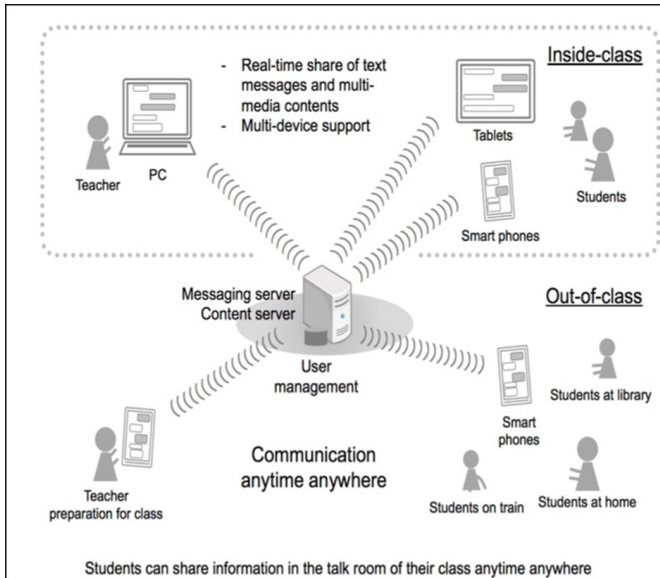


Fig. 4. Masking function of SCROLL eBook



**Fig. 5.** InCircle system configuration

The system allows users to create groups. Group members are able to send and receive messages and multimedia files in their chat room with an easy operation. Chat messages are synchronized in real-time to realize smooth communication. Figure 6 shows a chat room interface when the instructor posted an interrogative sentence: “Do you have textbook authorization system in your country?” since interrogative sentences trigger active interaction among learners which leads to mutual cross-cultural understanding.

In our system, we have mainly four major advantages:

#### **Teachers can be Administrators of the System**

Teachers can be administrators of the system so that they can watch the users/their students’ behaviors. Therefore, they can avoid their students’ malicious behaviors via InCircle. In case of inappropriate behavior from the part of a student, teachers can delete or close the student’s account.

#### **Teachers can Pre-register User Accounts**

Unlike other SNS or chat tools, such as Facebook and LINE, user accounts are pre-registered. Teachers create accounts for their students and make a group for the class in advance. There are always some students who do not want to use the existing SNS systems. In fact, in one of the authors’ classes, some students rejected to create a Facebook account and some students did not want to use LINE. Unless all the students agree to use it, it is not appropriate to use it as a communication tool in class. Besides, the existing SNS users usually post their private information on their profiles. However, some students may not wish to share private information with some of their classmates. In our system, on the contrary, there is no page in the first place to fill in their private information, such as school career, birth place/date.

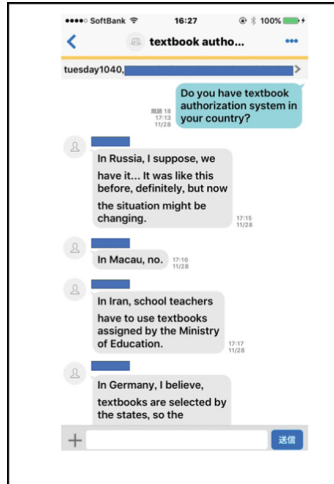


Fig. 6. InCircle chat room interface on mobile

(a) Security is ensured

Every effort was made in order to ensure the security, such as encryption of the cache data in the client terminal, channel coding, encryption of database, the use of different cryptography keys for each company or school in the server side. Therefore, it is highly protected against divulging of information or account hacking.

(b) Users can delete the sent messages.

In our system, we can delete messages after they are sent not only on the sender's side but on the recipient's side. It is likely to happen that we send messages by mistake. Our system can handle such human errors.

### 3.3 SCROLLeBook and InCircle Combined Learning

In this study, the learning scenario was designed to combine self-learning with group learning. Figure 7 shows SCROLLeBook & InCircle combined learning. Students learn career-related things with SCROLLeBook alone and interact with other classmates and the teacher at the same time. In order to encourage students to collaborate during the task, the teacher posted a topic which would be helpful to learn career-related things via InCircle. Students were encouraged to interact via InCircle by telling them the number of InCircle posts will affect their grades.

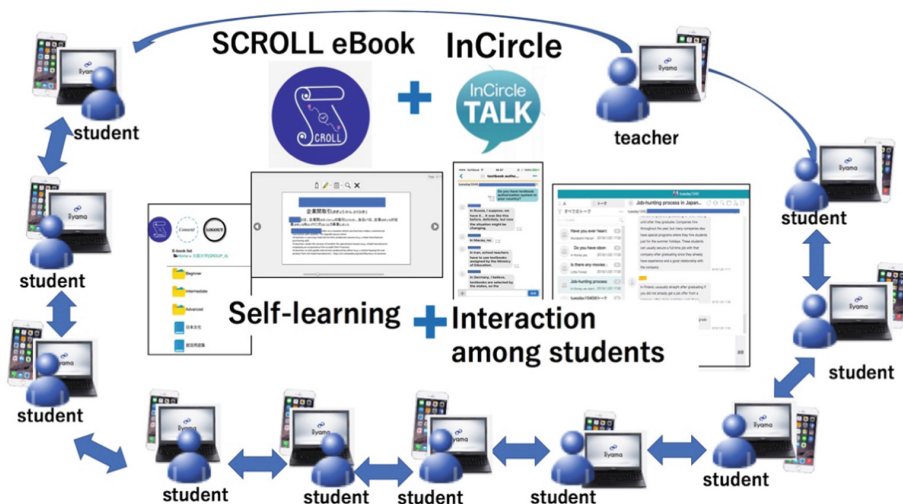


Fig. 7. SCROLL eBook & InCircle combined learning

## 4 Evaluation

### 4.1 The Target Class

Twenty-two international students (6 Chinese, 3 Korean, 2 Americans, 2 Filipinos, 1 French, 2 Germans, 1 Canadian, 1 Danish, 1 Dutch, 1 Finnish, 1 Hong Konger, 1 Taiwanese), who are studying at the University in the western part of Japan participated in the evaluation experiments. The target class was held on a once-a-week-basis in a CALL (computer assisted language learning) room during the fall semester, 2018. Each student had a PC in class. The class was one of “international exchange subjects” which was targeted mainly for international exchange students whose length of stay varies from half a year to one year. Some are regular students who aim to graduate from the university in Japan. The objectives of the target class were (1) to improve the skills of their target language, Japanese and (2) to enhance cross-cultural understanding as well as to learn Japanese affairs. The evaluation was conducted during the class held in January 22nd, 2019.



### 4.2 Procedures

Figure 8 shows the learning scenario.

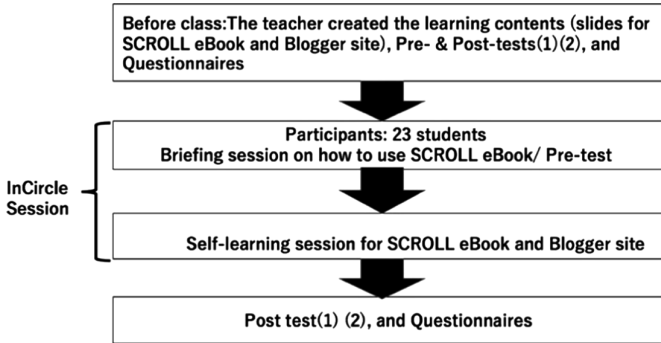


Fig. 8. Evaluation procedures

The teacher created 15 slides (8 for SCROLL eBook contents, 7 for Blogger contents), of career related terms such as “**年功序列**” (promotion by seniority), “**PREP法**” (PREP method). The objective of the contents was to learn business Japanese, especially useful terms in terms of job-hunting. At the beginning of the session, the participants took the pre-test to examine whether they know the meanings of the target terms. The students were given a briefing on how to use SCROLL eBook and given the URL of the Blogger site to be learned. Then they were assigned to learn the target terms on a self-learning basis using SCROLL eBook and Blogger site (Figs. 9 and 10). In order to examine the effectiveness of SCROLL eBook, the comparison was made between SCROLL eBook and Blogger’s site. A class blog was created by the teacher using Google Blogger service at the beginning of the semester and used for the whole semester for class communication. Therefore the students were all familiar with handling Blogger site. The teacher created a new Blogger site for learning career-related terms which were given in the pre-test. In order to give an equal opportunity of

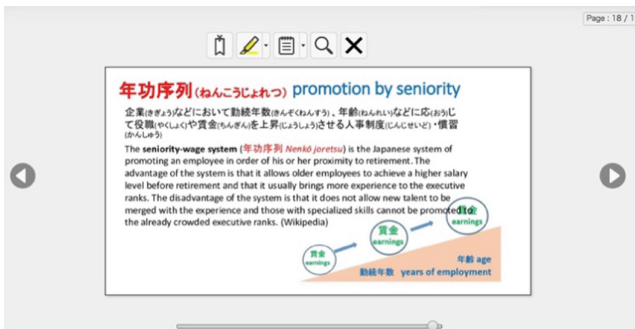


Fig. 9. SCROLL eBook content “年功序列” (promotion by seniority)

education using the cutting-edge technology, there was no control group created. Therefore the whole class experienced both medias. During the session, students were free to use InCircle on PC to communicate with other classmates and the teacher. After the evaluation, Post-tests (1) & (2) were taken by the participants and the questionnaire was conducted in the whole class.

**PREP法/PREP Method**

1月 21, 2019

PREP法

- P=Point (結論)
- R=Reason (理由)
- E=Example (事例、具体例)
- P=Point (結論を繰り返す)

結論からさきに言う！Point(Conclusion) comes first!  
最も主張したい事を、はじめにもってくる！！

論理的表現手法:PREP法とは

「私はこう思う」

「なぜなら、こうだからだ」

「例えば、こういうことがある」

「だから、私はこう思う」

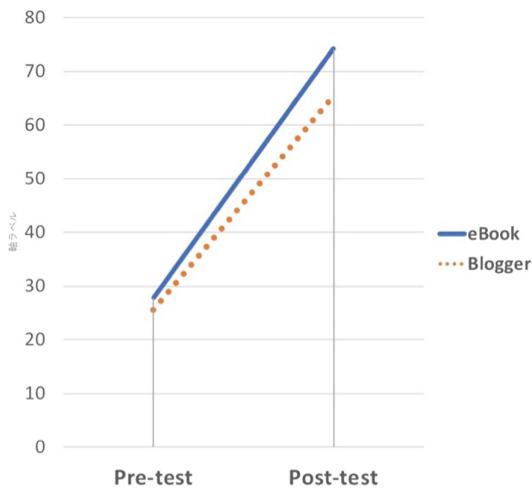
Fig. 10. Blogger content, “PREP法” (PREP method)

### 4.3 Results

Table 1 shows the result of the Pre- and Post-test (1) and (2). Pre- and Post-test (1) were identical to ask them the meaning of 8 Japanese career-related terms to be taught via eBook. Pre- and Post-test (2) were also identical to ask them the meaning of 7 Japanese career-related terms to be taught via Blogger site. Two points were given for each question, thus the full mark was 16 points for Pre- and Post-test (1) and 14 points for Pre- and Post-test (2). The mean scores of the Pre-test (1) and (2) taken by the Japanese language learners in class were 4.45(27.8%) and 3.57(25.5%) with the standard deviation(SD) of 3.46 and 2.10. After the learning session, the result of Post-test (1) jumped into 11.86(74.1%) with the standard deviation of 4.18(26.1), while that of Post-test (2) was 9.18(65.6%) with the standard deviation of 5.14(36.7). T value, 5.03 shows that there is a statistically significant difference between them. Figure 11 shows that the mean scores increased in both medias but the mean score increased more when they learned with eBook.

**Table 1.** The result of Pre- and Post-test

	Pre-test(1) (full mark 16)	Post-test(1) after eBook use (full mark 16)	t-value of Pre-test(1)& (2)	t-value of Post-test(1) & (2)
Mean	4.45 (27.8%)	11.86(74.1%)	1.78 (p=0.08<0.05)	5.03 (p=0.00000963<0.05)
SD	3.46(21.6)	4.18(26.1)		
	Pre-test(2) (full mark 14)	Post-test(2) after Blogger use (full mark 14)		
Mean	3.57(25.5%)	9.18(65.6%)		
SD	2.10(15.0)	5.14(36.7)		

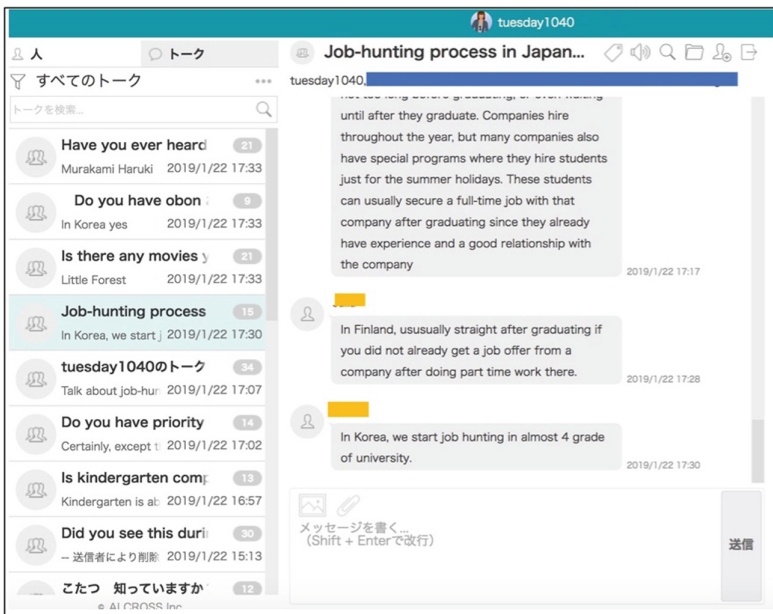


**Fig. 11.** Comparison between eBook learning and Blog learning in terms of the means of Pre- and Post tests

Table 2 shows the number of InCircle post of the students and the teacher during the evaluation. Since the students were free to communicate via InCircle, the contents are not necessarily related to job-hunting. Totally there were 78 posts by the students and 27 by the teacher. As the number shows, the students were active in posting messages on InCircle. However, even though [18] reported that there was an active interaction among students when they used InCircle, which did not happen in other communication tools, such a phenomenon did not happen in this evaluation. When the teacher posted a message to encourage students’ interaction: “Talk about job-hunting system in your home country! When do you usually start job-hunting?”, 12 students posted their comments. But unlike the teacher’s expectation, one student’s post did not lead to another students’ reaction. They just answered to the teacher’s question (Fig. 12).

**Table 2.** The number of InCircle post during the evaluation

	The number of InCircle post	Job-hunting related post	Job-hunting unrelated post
Students	78	12	66
Teacher	27	3	24

**Fig. 12.** InCircle communication on job hunting systems

## 5 Discussion and Conclusion

### 5.1 Discussion

At the end of the evaluation, they were asked to answer the five-point-scale-questionnaire on the individual- & interactive-learning-combined class as shown in Table 3. Q1 was created to examine the fun factor of our system. Q2 was created based on the technology acceptance model proposed by [23]. Q3 and Q4 were created to examine its effectness of masking function of eBook. Q5 was created to examine the user acceptance of its interface. The highest score, 4.5 was given when they were asked about the usability of the system (Q.2). The lowest score, 3.8 was given when they were asked about the effectness and likability of its masking function (Q.3 and 4).

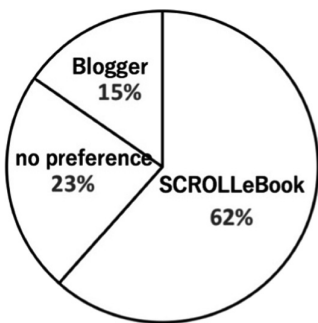
**Table 3.** The results of the 5-point-scale questionnaire

Questions	Mean	SD
Q.1 Was it fun to learn career related terms with SCROLL eBook contents?	4.2	0.60
Q.2 Was it easy for you to handle SCROLL eBook?	4.5	0.66
Q.3 Was the masking function helpful for you to memorise the terms? ✕masking function: by clicking the masks, important terms appear	3.8	0.69
Q.4 Did you like the masking function?	3.8	1.07
Q.5 Please rate its interface of SCROLL eBook	3.9	0.76

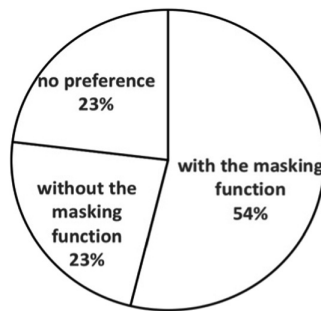
Figure 13 shows the result of the question: which one was the easier to handle, SROLLeBook or Blogger site? 62% of the students felt SCROLL eBook was easier to handle. It was in line with the high score of Table 3 Q2.

Figure 14 shows the result of the question: Which do you prefer eBook contents with or without the masking function? 54% of the students preferred “with the masking function” to “without”. Even though their evaluation rate was not so high (3.8), the majority preferred “with the masking function”.

Table 4 shows the participants’ free comments on the individual- & interactive-learning-combined class. Unlike the author’s expectation, most comments were concerned with eBook functions and not focused on the hybrid class, but most are positive ones and there is no clearly negative comment. As student #7 pointed out, late introduction of InCircle might have affected the effectiveness of its use. Student #7 also pointed out the diversion of attention, which he himself regards as a personal issue, but it is an important issue to cope with for an implementation of a successful PC-based learning.



**Fig. 13.** Which was easier to handle?



**Fig. 14.** Which did you like?

**Table 4.** The students' impressions of the individual- & interactive-learning-combined class

Student No.	Comments
#1	It's interesting to read about the Japanese career system and its related terms, but it's more beneficial for me to discuss them (such as using InCircle) during class. I can always read on my own time, but discussing in real-time is hard to do outside of class
#2	We can share our opinion with other classmates
#3	Nothing special, I don't figure out what's the point of InCircle when we can also start a line group to communicate in the same way
#4	Convenient to use
#5	It is very convenient to read
#6	It was interesting. But the masking is not for me
#7	The eBooks were quite useful. I don't really see how InCircle contributed to my learning experience, but that might be because it was only introduced towards the end of the class and I didn't really have much time to include it into my learning. Might have been nicer to introduce it earlier (and to provide an app, because for me, messengers need to be in an app - I don't like having to go out of my way and log in online for "just" a messenger. For that matter, I don't like facebook either, if it wasn't for the app. Might also be connected to the fact that I would have to scroll through my bookmarks until I find InCircle - and there are lots of interesting things to find that might divert my attention away from learning. A bit of a personal issue and need for self-discipline, but an app is just nicer)
#8	I didn't really have an opinion
#9	I think it is very helpful and in an easy form for us to learn
#10	eBook was pretty okay. InCircle was convenient as well as a messaging tool
#11	It is complicated, but fun to learn

**Table 5.** The results of the 5-point-scale questionnaire

	Questions	Mean	SD
Q.1	Was it easy for you to use InCircle?	4.6	0.70
Q.2	Was it fun for you to use the system?	4.1	1.02
Q.3	Was it helpful as a means of communication with your classmates and teacher?	4.2	0.79
Q.4	Was it helpful for understanding Japanese culture and other cultures?	4.1	0.94
Q.5	Was it helpful for your target language learning?	3.5	1.07
Q.6	Please rate its interface	4.0	0.91
Q.7	Please rate the whole system	3.9	0.76

They were also asked to answer the five-point-scale-questionnaire on InCircle function as shown in Table 5. Q1 and Q3 were created based on the technology acceptance model proposed by [18]. Q2 was created to examine the fun factor of our system. Q4 and Q5 were created to examine its contribution to the class objectives. Q6 and Q7 were created for examining the user acceptance of its interface and the whole system.

Table 6 shows the participants' free comments on InCircle. Most comments were positive ones, but there is one clearly negative comment: #12. As mentioned in the Sect. 2.2, the fact that 70% of the students preferred learning alone. There might be a possibility that the negative attitude toward group learning reflected the negative comment on InCircle. This is not directly connected with the effectiveness of the system itself, but we need to consider this fact.

**Table 6.** The students' impressions of InCircle

Student No.	Comments
#1	Easy to use and fresh system
#2	It's solid chatting app. But I don't know if people will use it over LINE or Facebook Messenger
#3	simplified LINE
#4	It's not so attractive since we can also have such a talk in Line or some apps
#5	It simple and good to use
#6	Many functions is not available e.g. correcting others' sentences
#7	I thought it was a great way to exchange information with everyone, especially about our culture differences, while listening to the teacher or the presentations
#8	It seems very simple, but not very practical for use outside of class. There are simply more convenient apps to communicate with classmates
#9	First time using these kind of tools, interesting, I felt like I was chatting with friends during class
#10	It makes us talk more and involve more in the class. Convenient and nice
#11	We can talk about Japanese culture
#12	I don't really like group chats, so I found it rather annoying when people sent stuff in the group
#13	User interface was very clean and nice
#14	Simple and useful, especially when you want everyone's opinions. Everyone can answer at the same time
#15	I love it. Students can share their stories through this platform, I found it very helpful

## 5.2 Conclusions

In this study, we describe facilitating business Japanese learning using SROLLeBook and InCircle. When compared with Blogger site, SCROLLeBook showed its superiority in many aspects as described in Discussion section. The questionnaire results

showed that the students were satisfied with its usability. There was a statistically significant difference in the Post-test results between SCROLLeBook learning and Blogger learning. Therefore our hypotheses (our system contributes to international students' learning business Japanese: Research Question (1)) was proved to be correct. However, it was found out that our system was not supportive for entwining individual learning with interactive learning. Since interactive and collaborative learning is essential in language learning, it is necessary to consider how to encourage learners to interact with each other. It is among our future works to find out some solutions to implement hybrid learning method via SCROLLeBook and InCircle.

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