A Qualitative Study of the Process and Strategies of English Academic Reading at a Japanese Graduate School

日本の大学院における英語アカデミックリーディングの質的研究

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Abstract : The interest in second language academic reading strategies has been rising. This study investigated the strategy use of two Japanese graduate students in Japan as they read specialized academic material in English during one semester. Data were collected through two questionnaires, two semi-structured interviews, and reading logs. Analyses of the data revealed that the participants were experiencing much difficulty in academic reading and employed a variety of reading strategies to overcome them. The data also indicated that the participants utilized their L1 as a useful cognitive resource. The implications of the findings for English language education are discussed.

Key words : English academic reading, reading strategy, qualitative study, EFL environment

I. Background of the Study

The scarcity of input in English language education in Japan has been pointed out for many decades. For average Japanese students, the first experience of reading English extensively would be when they read specialized academic material written in English at university level. It can be easily imagined that the students experience great difficulties as they read academic material in English especially in EFL environment.

However, what specific difficulties the readers experience and in what ways readers overcome them have not been revealed. Although strategy use in English academic reading has drawn much attention of researchers, and studies on reading strategies have been implemented in wide variety of settings, to date, no study on English academic reading in Japanese graduate schools has been done. In addition, there have not been enough qualitative studies on academic reading, which is crucial to reveal what quantitative studies cannot show.

In this study, Japanese graduate students' English academic reading was investigated qualitatively for one semester. This article describes what reading strategies EFL students use and how the strategies might change during the period.

II. Previous Studies

Research on academic reading strategies has been implemented both quantitatively and qualitatively. Most of the studies are carried out in an ESL environment.

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1. Quantitative Studies on English Academic Reading

Most of the qualitative studies in English academic reading have been done in an ESL environment. For example, Aziz, et al (2011) investigated the strategy use of sixty Malaysian engineering major university students, using a questionnaire. Tercanlioglu (2004) conducted an investigation of reading strategies of eleven international (ESL) students and six English speaking (L1) students studying in a British graduate school. At a Japanese university, Shikano (2014) investigated the strategy use of sixty non-English major students. Findings from these quantitative studies revealed that Japanese EFL readers, ESL and L1 readers all use similar kind of strategies such as adjusting the speed of reading and guessing the meaning of unknown words. The studies also revealed that the readers with more advanced English proficiency employ metacognitive strategies more often. While the findings show the general tendency, specific difficulties readers in a specific environment feel and their strategy use cannot be seen clearly. Perhaps this is the limitation of the investigation using a set list of questions.

2. Qualitative Studies on Strategy Use in Academic Reading

Not many qualitative studies have been implemented to look into the reality of the strategy use. Li and Munby (1996) investigated the strategy use in an ESL environment qualitatively by observing two Chinese graduate students studying at a university in England for two months. While the findings of the study provide much insight about academic reading in ESL environment, the change in the strategy use over two months of the research period is not reported. Gao (2006) and Liu (2015) also conducted qualitative studies in similar settings to investigate the change of strategies. However, their studies only showed the change in readers' attitude caused by environmental changes.

Saengpakdeejit and Intaraprasert (2014) investigated the strategy use of academic reading in an EFL environment and revealed that Thai students heavily relied on their L1 via use of dictionary and translating. Lou (2010) investigated Taiwanese university students' academic reading in an EFL environment over one academic year to present the concrete picture of the students' awareness of reading strategies and how they change their reading strategies. The result revealed that reading strategies do change over time and that participants experienced great difficulties because of the lack of vocabulary and background knowledge. Although Lou's study provides us a much clearer view of the nature of academic reading in an EFL environment, because of the nature of the qualitative research, the results found in her study are unique to the specific readers in the specific environment and therefore cannot be generalized. Especially, an increasing amount of English academic reading is assigned in Taiwanese universities today, even at the undergraduate level (Lou, 2010). In typical Japanese universities, most reading materials are written in Japanese. This is one of the greatest differences between Taiwan and Japan.

III. Method

1. Research Questions

The present study examines the concrete picture of the nature of Japanese graduate students' academic reading, which has never been studied qualitatively. In this study, two first year graduate students were observed over one semester. The present study was expected to answer the following two research questions by observing academic reading of Japanese graduate students.

Research Question 1: What difficulties do Japanese graduate students feel in academic reading and what strategies do they use to overcome them?

Research Question 2: Do the strategies the Japanese graduate students use in academic reading change over time?

During the first semester in 2015, questionnaires, reading logs, interviews were employed to collect data from two graduate students as they read a textbook written in English for one course. At the beginning and the end of the semester, the participants took a TOEFL practice test. The data collected through reading logs and interviews were broken down into phrases to construct meaningful categories. Each phrase from reading logs was given the date. When quoted, it is indicated as, "I used the dictionary about ten times (April 28)". Each phrase from interviews was numbered. Interviews were conducted twice. When quoted, it is indicated as, "Those that I couldn't understand, even in Japanese were very difficult (II24)", showing this is the twenty fourth phrase from the second interview. In the following, the participants, the setting, the TOEFL practice test, the questionnaire, the reading logs, and interviews are described. In the end, the data analysis is explained.

2. Participants

The main target of the present study was the two graduate students whose data were analyzed and discussed in detail. For the purpose of comparison, in addition to them, data were also collected from another student. Each background of the three participants is described below.

(1) Background of Taro

Taro (pseudonym) is a male graduate student who was twenty-six years old during the study. After graduating from English language education course of University of Yamanashi, Taro went to Australia through a working holiday program. After spending one year in Australia, he enrolled in the master's program in English language education at University of Yamanashi.

Taro scored the highest in the TOEFL practice examination among the three participants. Not only did he have advanced knowledge of English, but also seemed to have acquired English as an actual tool for real-life communication. Taro likes reading Japanese books, and he does not feel pressured to read in English. Taro had a positive and active attitude toward learning, and the same attitude was evident in the academic reading in this study.

Among the students in the course for which the textbook was read, only Taro and Keiko (another participant) were formally enrolled as graduate students, and they were the only ones that were to answer questions asked by the instructor.

(2) Background of Keiko

Keiko (pseudonym) is a female graduate student who was twenty-three years old during the study. After graduating from English language education course of University of Yamanashi, she enrolled in the master's program in English language education at University of Yamanashi.

Though she loves reading both in Japanese and in English, fresh out of undergraduate program, Keiko was to face her first academic reading without much experience in reading extensively and not much interest in English education, which is the focus of the textbook.

As with Taro, Keiko was expected to be prepared to answer questions from the instructor.

(3) Background of Jiro

Jiro (pseudonym) is a male teacher at a local elementary school who was thirty-four years old. During the study, Jiro was on leave for a year to take classes at University of Yamanashi. He was a diligent adult student who would not give up and managed to go over the assigned material though it was extremely difficult for him.

3. Setting

The course under consideration is a required course for the first year graduate students in English language education course. The course was offered from April through July in 2015. This is one of the first course that first year graduate students take. The course consists of fifteen weeks of classes. Among the fifteen, ten classes were dedicated to the actual reading and the explanation of the material read. Each week, the students were assigned to read one chapter of the course textbook. During the class, the instructor explained the contents of the assigned material, and he also asked questions to make sure the students' comprehension of the contents.

The course textbook used in the class was, Introducing Second Language Acquisition (Hummel, 2014). It is an introductory textbook of second language acquisition written mainly for university students whose first language is English.

4. Proficiency Test

TOEFL practice test was implemented twice to examine the change of the participants' English proficiency during the course. Each participant took it a few weeks after the course began and after the course was over. The practice test employed for the purpose of this study is taken from Wadden, Hilke, and Fujii (2015).The same test material was used for both first and second time.

5. Questionnaire

A questionnaire was implemented twice at the beginning of the semester and at the end in order to examine the change of the participants' reading strategy use. The instrument used for this study was Survey of Reading Strategies (SORS), which was constructed by Mokhtari and Sheorey (2002) (See Appendix). It is a list of questions designed for ESL readers to measure their reading strategies. Participants responded to thirty questions, rating each of them on a five-point Likert-scale which ranges from "1) never or almost never" to "5) always or almost always." Although the questions were written in simple English for ESL readers, to avoid misunderstanding, the author translated all the questions into Japanese.

The thirty strategies in SORS are divided into three sub-categories. The first category is Global Reading Strategies (GLOB). Originally labeled as Metacognitive Strategies, Global Reading Strategies include having the purpose in mind and taking an overall view of the material before reading. The second is Problem Solving Strategies. The examples include adjusting the rate of reading and guessing the meaning of unknown words. The third category is Support Strategies. Among these strategies are using dictionaries, taking notes and underlining.

The evaluation of the questionnaire was made according to Mokhtari and Sheorey (2002) as follows. For each respondent, sub-categories are grouped together, and within a sub-category, all points from the Likart-scale are added and divided by the number of questions to achieve the average score. According to Mokhtari and Sheory's standard, the average score was interpreted as follows: 2.4 and lower as low usage, between 2.5 and 3.4 as medium usage, and 3.5 and higher as high.

Different researchers have different ideas about what strategies are. Mokhtari and Sheory themselves admit

that SORS is not the perfect instrument in measuring reading strategies. Yet, SORS was employed and its standards were followed for this study because it had been used by previous studies on reading strategies.

6. Reading Logs

For ten weeks, during which the students read the assigned material, three participants kept reading logs. Each week, the participants wrote about their reading experience and strategy use including information such as the chapter they read, the number of pages read, and time spent in reading.

7. Interviews

Interviews were conducted twice in order to examine what difficulties the participants faced and what reading strategies they used to overcome the difficulties during the course. About two weeks after the students began reading the textbook, the first interview was conducted. After the course ended, the second interview was conducted. The author met with each participant individually at one of the classrooms reserved for the interview. The interview was in a semi-structured style. All interviews were done in Japanese, and lasted for thirty to forty minutes. Interviews were tape-recorded. They were transcribed by the author later.

8. Data Analysis

The data collected from Taro and Keiko were analyzed and discussed in detail, but for the purpose of comparison, the data collected from Jiro were also analyzed.

The data from the reading logs and interviews were broken down into phrases. Each of them was labeled with numbers and dates so that each phrase could be traced back to the original data. The interview data of the first and the second sessions were analyzed separately so that the analyzed data could be compared. The data were organized in a chart on Excel.

IV. Results and Discussion

In this chapter, the results and discussion of the TOEFL test and the questionnaire are presented first, followed by two case studies of Taro and Keiko.

1. Results of the TOEFL Practice Tests

The result of the TOEFL practice test is summarized in Table 1. The expected scores are included, which were calculated according to the conversion chart proved by Wadden et al.

Table 1. Result of the TOEFL Practice Tests

		Taro	Keiko	Jiro
Test 1	SWE 1 (100%=40)	31	30	15
	RC 1 (100%=50)	31	25	17
	Expected score of Test 1	530	505	395
Test 2	SWE 2	30	27	18
	RC 2	35	24	20
	Expected score of Test 2	545	480	420

Compared to Jiro, the two graduate students had much higher scores. Taro showed the highest English proficiency.

Only Jiro did better in the second test in both Structure and Written Expression and Reading Comprehension, which mainly shows grammatical ability. Jiro seemed to have recalled and gained much knowledge of English in the period of one semester.

On the other hand, the graduate students' grammatical ability did not improve. It may be that reading academic material for just one semester would not be effective enough to improve their grammatical ability, which was already high.

As for the Reading Comprehension, Taro achieved the highest score in the first test, and his score improved the most in the second test. After taking the second test, Taro commented, "…endurance of reading long sentences improved (II18)", and "I felt less mental pressure (II23)." In the second test, Taro seemed to be able to read with less effort than in the first, which contributed to the better performance. Taking reading strategy use into account, it may also be said that Taro was able to utilize reading strategies better than others during the semester, and it improved his reading comprehension.

2. Results of the Questionnaires

In this section, we discuss the general tendency of reading strategy use, and we will discuss in detail items which seem important and unique in the following sections of the case studies.

The results of the questionnaires are summarized in Table 2.

Table 2. Scores of the Questionnaires Based on Survey of Reading Strategies

Participants	Categories of Reading Strategies	Questionnaire 1 (April)	Questionnaire 2 (July)
Taro	GLOB	4.2 (high)	3.8 (high)
	PROB	3.8 (high)	4.0 (high)
	SUP	2.8 (med)	3.4 (high)
	Average	3.6 (high)	3.8 (high)
Keiko	GLOB	3.4 (med)	3.5 (high)
	PROB	3.9 (high)	3.8 (high)
	SUP	3.8 (high)	3.9 (high)
	Average	3.6 (high)	3.7 (high)
Jiro	GLOB	3.4 (med)	2.8 (med)
	PROB	3.5 (high)	4.1 (high)
	SUP	3.0 (med)	2.6 (med)
	Average	3.3 (med)	3.1 (med)

(Note: 3.5 or higher = high, 2.5-3.4 = medium (med), 2.4 or lower = low, GLOB: Global Reading Strategies, PROB: Problem Solving Strategies, SUP: Support Strategies)

Based on the overall scores, we can see that both graduate students made use of more strategies than Jiro. The average scores show that Taro used strategies most frequently and his use of Global Reading Strategies was the highest.

The general tendency of the two graduate students supported the results of the previous studies (Aziz, et al., 2011; Nordin, et al., 2013; Shikano, 2014).

This general tendency gives us only a rough picture of the strategy use in academic reading. For a clearer view, in the following sections, we look at the case studies using interview data as well as notable items from the questionnaire data.

3. Case Studies

In this section, each participant's academic reading is described in more detail. In each case study, we describe affective attitudes toward the reading assignment and the difficulties the participant felt because those seem to affect the strategy use. Then we illustrate the strategies used by each participant.

3.1 Case Study of Taro

3.1.1 Taro's Affective Attitude toward the Reading Assignments

Although the reading was not easy for Taro, his comments clearly showed his expectation and determination to learn through the reading ("I had imagined doing that kind of reading, so I was mentally prepared…II45"). Taro was also expecting to broaden his vocabulary size and improve the reading fluency ("I wanted to gain the knowledge of the contents as well as the specific terms…I65").

3.1.2 Difficulties Taro Felt

The greatest difficulties Taro felt was "the amount of the unknown words (I68)." Taro also listed the amount of reading for assignments as difficult. It caused him to spend long hours reading. Because of the overwhelming amount of reading, it was difficult to concentrate on the assignments, and "it took longer (to read) in a vicious cycle (II9)." The difficulty of the contents further worsened the vicious cycle. Taro spent three to five hours for one week's assignment, and he often had to divide it into a few sittings. When Taro resumed his reading, he had often forgotten what he had read. ("What I read is partially gone when I pick up from where I left."II107)

The difficulty Taro experienced can be summarized as follows. Taro found many unknown words in the text, the content of which was difficult. He often had to read without much background knowledge. All these caused him to spend long hours reading, which made it more difficult to understand, and Taro was battling with the vicious cycle.

As is mentioned below, Keiko was experiencing the same difficulty. However, the two participants took very different approach toward the reading assignment. This shows that, even when readers are given the same reading assignment and feeling the same kind of difficulty, they may still take different approaches toward the reading. In the following section, the strategies Taro used are described. Keiko's strategies are illustrated in her case study.

3.1.3 Strategies Taro Used

Taro's strategies can be categorized in three main ways: (1) adjusting the way of retrieving unknown words, (2) taking notes, (3) and underlining. Taro employed these strategies to increase the knowledge of the content and knowledge of English. Although Taro had some difficulties in academic reading, having those purposes, he positively employed reading strategies.

In addition, Taro was able to adjust the strategies as the time progressed, searching for the best ways to accomplish his purposes. Now each strategy is described in detail below.

(1) Retrieving Unknown Words

Item 28 of the questionnaire is guessing the meaning of unknown words. In both the first and the second questionnaire, Taro scored five points in this item indicating the greatest frequency of the strategy. This seemingly suggests that the way he made inference remained unchanged. However, the interview data shows that Taro intentionally changed the way he gets meanings of the unknown words twice. Taro began with looking up unknown words in his English Japanese dictionary as he read (II52). After reading two chapters, he stopped using a dictionary. Finally, Taro settled into the idea of underlining unknown words he cannot infer the meaning of and then looking several of them up in a dictionary (II54). Taro explains, "only inferring and leaving a word uncertain would be a waste (II56)." His determination to increase his vocabulary motivated him to search for the best way of retrieving the unknown words. When Taro looked up words, he only used an English Japanese dictionary, and never used the glossary in the textbook. It was the same with Keiko. It seems that using the glossary was inefficient for them because terms are defined in English. So, it can be said that, by using English Japanese dictionary, Taro utilized Japanese, when he was not certain that he was guessing the right meaning. Utilization of the first language is discussed in the next section.

(2) Taking Notes

Taro wrote down important terms and concepts on his notebook. He scored five points on the item concerning note taking in both the first and second questionnaires. Taro's note taking also changed over time. At the beginning, Taro was just copying down or paraphrasing important parts in English, but later, he started taking notes in Japanese, that is, he partially translated (II60). Giving the reasons for this, Taro mentions that it is difficult to understand without using Japanese. Further, Taro explains that notes in Japanese helps him to find specific information more easily and to grasp the meaning of the items he wrote much faster. Taro found it especially helpful when concepts are written in kanji, or Chinese characters, as it helped him to seize the meaning of a concept (II62, II65). Taro's notes functioned as an external device for the long-term memory and made it possible for Taro to review without rereading the textbook. Taro also took a part of his notes in Japanese. His use of L1 functioned as a support for comprehension as well as an external memory device.

Let us look at the role of L1 in understanding. Miyanaga (2001) quotes de Groot and Hoeks (1995) to explain the process of conceptualization in L2. As shown in Figure 1, L2 learners understand concepts through L1 first, and gradually develop into the stage where they can directly understand in L2. For Taro, without enough vocabulary and background knowledge, it was difficult to understand directly in L2. Utilizing L1 seems to have helped Taro to better comprehend what he read.

Figure 1. Process of Conceptualization in L2
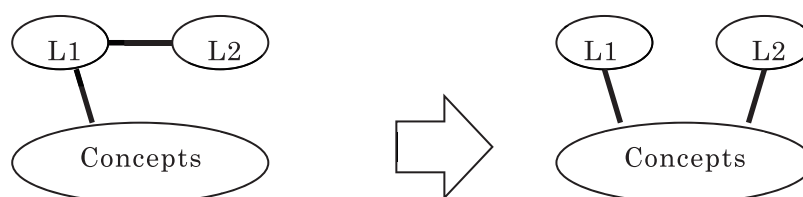
Furthermore, in terms of the role of working memory, Nakagawa (2009) claims translation helps readers understand texts in L2. Nakagawa explains that while working memory is wasted in bottom-up process of decoding L2 words, translated information supports the readers' memory, thus reducing the load of the working

memory. In other words, L1 provides more mental workspace for L2 reading. Taking these roles of L1 into consideration, by taking notes partially in Japanese, Taro was not only creating notes that were easy to review, but also was helping his comprehension, reducing the workload of the working memory as well as supporting the process of conceptualization.

(3) Underlining

As mentioned above, when he encountered an unknown word, he underlined it so he could easily find it later to look up in a dictionary. Also, he underlined important concepts. As with his notes, underlining seems to have lightened the workload of his working memory, helping his comprehension as he read. The way Taro underlined did not change during the semester, but the frequency of underlining increased a little according to the questionnaire.

(4) Taro's Remarks on the Assignment

As he finished a whole book of specialized material, Taro felt confident ("I had never read this much this hard, a whole book, but now I'm getting used to it." II17). As Taro took the second TOEFL practice test, he now had "endurance (II18)" to continue reading even though he still found many unknown words.

As for his vocabulary size, Taro felt it had broadened (II29).

Doing the assignment as a part of the course was helpful, and it became a good pacemaker for reading (II135, II136). Taro felt it was very fruitful to have discussions in a group of students which included international students and those with unique background (II132).

As advice to those who may take the same class, Taro listed reviewing the material on English language education and getting used to reading English (II121). It is evident that Taro deeply felt the importance of the background knowledge and proficiency of English.

3.2. Case Study of Keiko

3.2.1 Keiko's Affective Attitudes toward the Reading Assignments

Keiko felt insecure about learning something new through English, and the feeling of insecurity came from her desperate decoding of English in which comprehension was not easily achieved (I54). As she desperately tried to understand the content, Keiko was overwhelmed by the amount and the difficulty of it, and felt, "I'm in trouble. I don't even know what I don't understand (June 7)." She "panicked (I30, I87)" sometimes. However, Keiko patiently and diligently worked on the reading assignments.

3.2.2 Difficulties Keiko Felt

Since it was her first time experiencing academic reading, Keiko was overwhelmed by the amount of the text and feeling insecure. Keiko comments, "Every time I read, I don't know what degree of accuracy is necessary (I95)," indicating she felt insecure about the way she read. She continues to say, "If you really, really want to understand well, you could translate. (I95)" Her comment shows Keiko was thinking that the most accurate reading in English was achieved by translating each sentence. Many Japanese learners of English would feel the same way.

In the second interview, when asked what the greatest difficulty was, she replied, "the lack of background knowledge (II38)," without hesitation. As she continued attending the class, she had learned a reasonable pace

of reading, but she suffered from the difficulty of the content all the way through the semester. Keiko was able to decode each sentence using a dictionary even when she did not know "every single word in a sentence (I83)." However, she sometimes felt, "I can't understand even in Japanese (I46)" when trying to grasp the overall meaning of a paragraph or a section. As Keiko struggled constructing a coherent mental model, or a whole picture of a text, she seemed to have felt the need for background knowledge to be an indispensable element to build a mental model. Furthermore, her comments showed it was also difficult to keep what she read in her memory. ("It was so difficult to understand, and they were so fast leaving me behind" I52.)

3.2.3 Strategies Keiko Used

The strategies Keiko used are categorized as follows: (1) using a dictionary, (2) leaving traces and (3) keeping concentration. Especially, Keiko heavily depended on her English Japanese dictionary. Her working memory seemed to have been wasted in the bottom-up process, and she needed to support her memory and concentration by some ways.

(1) Using a Dictionary

She did not avail herself of the visual support provided in the text, and without visual supports, Keiko tried to comprehend only through textual information. In order to do so, a dictionary was indispensable. By using an English Japanese dictionary, Keiko was identifying the meaning of the text and deepening her comprehension through Japanese. This way of reading heavily depended on the dictionary had little change during the semester. Keiko explains that it was her "habit from the childhood (II236)."

Keiko was using an English Japanese dictionary mainly to compensate the lack of the depth of vocabulary. Using a dictionary and referring to Japanese websites, she was making much use of L1. The way she used these reference materials changed little, which seems to be the result of her education from childhood.

(2) Leaving Traces

Keiko jotted down unknown words on the margin of the textbook as she read, and looked up several of them in the dictionary, leaving the meaning of them on the margin. This strategy might seem a part of a dictionary use, however, Keiko would not have to write down each of them if she had found only few unknown words. So, this can be considered another strategy employed because of the overwhelming amount of unknown words. Using this strategy, Keiko no longer needed to remember every single word she looked up. When she read again, she had an easy access to the meaning she had identified earlier. Not only that, it seems that this strategy supported her working memory as she read, helping her comprehension.

Keiko also highlighted important items by making marks and underlining in the textbook. Sometimes she left the trace of understanding process. These marks helped her understand sentences as well as supporting her memory. It seems that Keiko's comprehension was supported as she read by visualizing the relationship between the elements of sentences, while leaving the trace of it helped her as she read again.

(3) Keeping Concentration

Keiko read aloud and made marks as she read in order to direct her attention to each word and sentence in effort to stay focused. In addition, she looked for a way to concentrate, which she found effective. This is considered as one of the metacognitive strategies.

(4) Keiko's Remarks on the Assignment

Keiko was relieved to have finished a whole book in English. ("I read a whole book. Well done, me!" II239.) However, she was not sure if she had actually understood what she read (II245). For Keiko, to read an academic textbook as a part of a course had been a great help. In the class, explanation of terms and concepts are given in Japanese, and Keiko was allowed to ask freely what she did not understand in reading. Her feeling of insecurity was relieved greatly being able to read in such a condition.

As advice to those who may take the same class, Keiko commented, "I wish I had taken notes in Japanese (like Taro) (II255)." Keiko seems to have felt the benefit of utilizing L1. She also mentioned that it would be beneficial to broaden background knowledge. Like Taro, Keiko seemed to have felt the importance of the background knowledge.

3.3 Summary of the Two Case Studies

To summarize the academic reading of Taro and Keiko is to answer two research questions. The first question was "What difficulties do Japanese graduate students feel and what strategies do they use to overcome them?" The answer to the question would be as follows: the participants felt the greatest difficulty in lack of vocabulary and background knowledge, which wasted their memory and concentration. The participants employed a variety of strategies to overcome the difficulties. They made inferences and used a dictionary to identify the meaning of unknown words. They also took notes and made marks on the text to support their memory. In different aspects of strategies, their L1 was utilized.

The second question was "Do the reading strategies the participants use change over time?" The answer would be as follows: Taro was able to search for more effective strategies and change his strategy use for the better. Keiko's strategy use showed little change. However, as time passed, she became more accustomed to the assignments. In addition to these findings, it was observed that both Taro and Keiko did not utilize the visual materials provided in the text to support their reading.

4. Conclusion of Results and Discussion

In general, the results of the questionnaires and case studies support the results of previous studies. However, the present study is significant because of the following three points: first, it has illustrated the change of strategies overtime; second, it has described the utilization of L1 in detail; and third, it has provided the detailed picture of the process of strategy use, which a mere questionnaire investigation could never have revealed.

In this study, the change in the strategy use was observed from the two questionnaires and the case studies. Especially, Taro was able to make changes in his strategies for more effective reading. In inferring unknown words and note taking, he decided to utilize L1 more. Taro's Support Strategies increased as we can see in the second questionnaire. Notably, his thinking in both English and L1 rose from two to five points, showing that his use of L1 increased. Among Support Strategies, underlining and circling also increased from three to five points, indicating that, besides utilizing L1, Taro made more use of making marks in the text, supporting his memory.

The most common strategy used in previous studies is the use of L1. The current study revealed how Taro and Keiko were utilizing L1 in more detail. Keiko mainly used the dictionary. She was utilizing L1 at the word level. Taro took notes partially in Japanese, utilizing L1 at the level larger than words. Partially translating and writing down may be common among Japanese learners, but it was not reported in previous studies. Although Keiko did not utilize such a strategy, her comments suggested that she would have used it if she could afford

more time and effort.

The results of the questionnaire showed that Problem Solving Strategies were most frequently used. However, from case studies, it seemed that the participants were making fuller use of Support Strategies, which were observed as the least common strategies in the questionnaires. Throughout the semester, Keiko depended on her dictionary. Using a dictionary is one of Support Strategies. Although Taro was inferring the meaning of unknown words at first, which is one of the Problem Solving Strategies, he began using a dictionary, as well as taking notes in Japanese. These are the two Support Strategies Taro purposely made adjustment in utilizing. Problem Solving Strategies include strategies such as adjusting the rate of reading and concentrating, which seem to be the basic reading attitude. When asked in a questionnaire, readers may respond as they would use them frequently. It may be that, in reality, toward their first academic reading, the participants needed to take approaches different from what they responded in the questionnaires. And they actually utilized Support Strategies which seemed uncommon from the result of the questionnaires.

As we have seen, the findings of this study support the previous studies in general, but they provided more vivid picture of academic reading in English.

V. Educational Implications

Since the participants' greatest difficulties derive from the lack of vocabulary and background knowledge, teaching methods and educational curriculums which support these weaknesses seem beneficial. The findings from the present study provide several educational implicaions. In the following, these are summarized into four points.

First, needless to say, the knowledge of English, especially, the vocabulary needs to increase. Among different aspects of vocabulary, in academic reading, the depth and the automaticity need to be improved. This kind of knowledge cannot be acquired by simply memorizing a word list. The opportunity to encounter new words in a variety of contexts must be provided so that readers can learn different usage of a word. To start reading extensively before reading academic materials in graduate school would be ideal. Koizumi (2009) introduces Extensive Reading, which has been drawing the attention of educators recently, as a way of increasing the vocabulary. Extensive Reading is a language learning method in which readers are to read large amount of materials easy enough to be read without a dictionary. Supporters of Extensive Reading list increasing the size, depth and automaticity of vocabulary as a benefit of this method. Although educators and researchers have different opinions about the practice and benefit of Extensive Reading (Shirahata, 2004), it is most likely that, by reading extensively, readers can not only broaden their vocabulary, but also improve their reading skills. Students will benefit greatly from reading extensively in a school curriculum.

Second, it is also important to create an environment for academic reading where readers can rely on much background knowledge. Although the participants in the present study had some knowledge of the contents of the textbook from their undergraduate classes, they still had much trouble understanding the textbook. To reduce this kind of difficulty, the curriculum in which contents are learned in Japanese first and then in English seems helpful. If the learning in Japanese is done by reading extensively, it can be expected that, in addition to the content of the reading, reading skills such as reading a large amount and extracting important information out of it may be learned. For example, students can read a chapter of a Japanese textbook on Second Language Acquisition each week as a main part of a course, then, as a side reading material, an English textbook whose

content is similar to the Japanese one can be assigned.

Third, students also need an environment where they can receive much support from their instructor and from each other. Taro and Keiko commented that reading as a part of a course helped to pace the reading and reduced anxiety. Moreover, the participants were greatly helped to better understand the material by receiving explanation in Japanese and having discussions in Japanese with other members of the class. While reading in English and then having discussion about the material in English may be ideal, at least at the beginning of the highly academic endeavor, reading with much support in L1 seem more beneficial for students.

Finally, L1 use needs not to be avoided. As Taro and Keiko utilized strategies, they made much use of L1. The same was true with the participants of previous studies whose English proficiency seemed high (Li & Munby, 1996; Gao, 2006; Liu, 2015). Academic reading in English is not merely a language learning, but it is also an actual learning of a content, which requires more intense and deeper thinking. So, in academic reading, use of L1 should be considered not as an undesirable and unavoidable influence on readers, but rather as an effective cognitive resource readers can resort to. To conclude, it is desired to provide more opportunity to read extensively to improve various aspects of reading. It is also important to provide the environment where students can read having much background knowledge and with support from instructors and class members. L1 should be readily utilized as an intellectual asset to L2 readers.

VI. Closing Remarks

In this study, one-semester's academic reading of Japanese graduate students was observed. The participants felt difficulties in lack of vocabulary and background knowledge, and employed various strategies to support their memory. Notably, L1 was utilized in many aspects of strategies. The change in strategy use was clearly seen in the reading of Taro, who had higher English proficiency and more definite goals for reading. He was able to purposely change strategies. While the results of the study generally support previous studies, they provided more detailed picture of academic reading. Especially, the present study is significant because it provides the description of an academic reading in Japanese graduate school, which has never been investigated. However, because of the nature of the qualitative study, this study observed the reading of only two participants, and the results cannot be simply generalized. Also, the study lasted only one semester, less than four months. It would have been interesting to observe how the participants grew as readers during a longer period of time. Furthermore, Japanese graduate schools vary from one to another. It is desired that more studies of this nature will be implemented in different settings of higher education with more participants so that the findings will be integrated to provide insightful information about academic reading.

This study revealed that the participants did not deliberately employ L1 as one of many reading strategies but utilized it as an effective cognitive resource in all aspects of reading. It seems worthwhile to examine the role of L1 in academic reading. It may be expected that even clearer picture of academic reading in English should be provided by investigating how L1 is utilized in this complex and highly intellectual process.

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Appendix

SURVEY OF READING STRATEGIES (SORS)

Each statement is followed by five numbers, 1,2,3,4,5, and each number means the following:

"1" means that "I never or almost never do this".

"2" means that "I do this only occasionally".

"3" means that "I sometimes do this". (About 50% of the time.)

"4" means that "I usually do this".

"5" means that "I always or almost always do this".

After reading each statement, circle the number (1,2,3,4, or 5) which applies to you. Note that there are no right or wrong responses to any of the items on this survey.

Category	Statement	Frequency
GL	1. I have a purpose in mind when I read.	1 2 3 4 5
SUP	2. I take notes while reading to help me understand what I read.	1 2 3 4 5
GL	3. I think about what I know to help me understand what I read.	1 2 3 4 5
GL	4. I take an overall view of the text to see what it is about before reading it.	1 2 3 4 5
SUP	5. When text becomes difficult, I read aloud to help me understand what I read.	1 2 3 4 5
GL	6. I think about whether the content of the text fits my reading purpose.	1 2 3 4 5
PRO	7. I read slowly and carefully to make sure I understand what I am reading.	1 2 3 4 5
GL	8. I review the text first by noting its characteristics like length and organization.	1 2 3 4 5
PRO	9. I try to get back on track when I lose concentration.	1 2 3 4 5
SUP	10. I underline or circle information in the text to help me remember it.	1 2 3 4 5
PRO	11. I adjust my reading speed according to what I am reading.	1 2 3 4 5
GL	12. When reading, I decide what to read closely and what to ignore.	1 2 3 4 5
SUP	13. I use reference materials (e.g., a dictionary) to help me understand what I read.	1 2 3 4 5
PRO	14. When text becomes difficult, I pay closer attention to what I am reading.	1 2 3 4 5
GL	15. I use table, figures, and pictures in text to increase my understanding.	1 2 3 4 5
PRO	16. I stop from time to time and think about what I am reading.	1 2 3 4 5
GL	17. I use context clues to help me better understand what I am reading.	1 2 3 4 5
SUP	18. I paraphrase (restate ideas in my own words) to better understand what I read.	1 2 3 4 5
PRO	19. I try to picture or visualize information to help remember what I read.	1 2 3 4 5
GL	20. I use typographical features like bold face and italics to identify key information.	1 2 3 4 5
GL	21. I critically analyze and evaluate the information presented in the text.	1 2 3 4 5

SUP	22. I go back and forth in the text to find relationships among ideas in it.	1 2 3 4 5
GL	23. I check my understanding when I come across new information.	1 2 3 4 5
GL	24. I try to guess what the content of the text is about when I read.	1 2 3 4 5
PRO	25. When text becomes difficult, I re-read it to increase my understanding.	1 2 3 4 5
SUP	26. I ask myself questions I like to have answered in the text.	1 2 3 4 5
GL	27. I check to see if my guesses about the text are right or wrong.	1 2 3 4 5
PR	28. When I read, I guess the meaning of unknown words or phrases.	1 2 3 4 5
SUP	29. When reading, I translate from English into my native language.	1 2 3 4 5
SUP	30. When reading, I think about information in both English and my mother tongue.	1 2 3 4 5

(Note: Categories are not stated in the actual questionnaire sheet.)