



Effect of a six-year long extensive reading program for reluctant learners of English

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Abstract

English as a foreign language (EFL) education in Japan especially in engineering major had suffered its ineffectiveness for several decades. Engineering students were reluctant to learn the language and the graduates had to struggle long after the graduation. One reason for the failure was the absolute lack of exposure to the target language. Learners used English only in the classroom, and English grammar and vocabulary were taught as knowledge using Japanese for the explanation.

To guarantee the necessary exposure to English, we added extensive reading (ER) lessons once a week through the year from second to seventh grade to our seven-year engineering course in 2004. The effect was measured by the TOEIC tests, which the third and sixth graders took every year. As the graduates in 2009 and later academic years received the full advantage of the six-year ER lessons, we could compare their TOEIC scores with the ones of former students.

The effect was rather fragile in the third grade, however, we found significant TOEIC score increase in the sixth or seventh grades, which was comparative to the score increase caused by studying in English speaking countries for 10 months. After a certain threshold, around four years or later in our program, the students become free from anxiety, relaxed in reading and listening, and eager to speak or write in English. In this paper, the authors would like to share the role of comprehensible input upon EFL learners, installment and practice of ER programs, and improved attitude of reluctant learners through ER.

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Keywords: Extensive reading; English as a foreign language; Total words read; Duration of the program; TOEIC

1. Background

Japanese students' English proficiency is generally low as is shown in the national average scores of the Test of English for International Communication (TOEIC). The TOEIC is a standardized proficiency test of receptive English skills for non-native speakers of English (Woodford, 1982) widely used in Japan. The test scores are categorized in five levels: A (860 - 990); B (730 - 855); C (470 - 725); D (220 - 465); and E (10 - 215) by the proficiency scale (IIBC, 2015: 23). From the description of the can-be lists on the proficiency scale, we call the level C as lower-intermediate, the level D as elementary, and the level E as beginner in this study. The institutional program of the TOEIC had 1.29 million test takers in 2014 academic year (IIBC, 2015: 5), where 62% belonged to the score zone almost match to the beginner or the elementary levels (10 - 490) and 31% stayed in the score zone almost match to the lower-intermediate level (495 - 740). While the average score of university students major in English improved to the lower-intermediate level in their fourth grade, average scores of students in National Institution of Technology (NIT) colleges and university students major in Science, Engineering, and Agriculture stayed in elementary level for almost the decade.

One possible reason for the low English proficiency of Japanese Engineering students was the absolute lack of exposure to the target language. The students learnt English as knowledge for examinations, used grammar-translation as the default method, and did not use the language outside the classroom. Because Japanese students had little experience of actually reading English books without translation or listening English narrations and did not use English in daily life, they naturally lacked the exposure to the language necessary to read or listen it fluently. Their

reading often meant translating English texts into Japanese word by word, and they did not believe it possible that they were able to comprehend English texts without translation.

Extensive reading (ER) was a potential remedy to increase the students' exposure to the language in English as a foreign language (EFL) settings, where the language was not used outside the classroom. Day and Bamford (1998) clarified ten characteristics of successful extensive reading programs, two of which were "students read as much as possible" and "reading materials are well within the linguistic competence of the students in terms of vocabulary and grammar" (pp.7-8). However, the influence of ER on English education in Japan was limited until the beginning of 21st century when Sakai (2002) proposed one million words as a milestone for ER, Sakai and Kanda (2005) proposed a detailed methodology of conducting SSR programs, and Furukawa & Itoh (2005) published an introductory guidebook of ER for adult learners. They stressed the importance of the amount to be read along with the easiness of the English texts as the means of comprehensible inputs.

The benefits of ER should also be shown quantitatively because Japanese teachers were wondering if the benefits of ER were large enough to alter the current teaching practices. They were especially uncertain if the promised benefits would transferred to their students' academic performances at school, or scores at high-stake examinations or standardized tests. They also needed to know the quantity and quality of their students' effort to enjoy the benefits, in other words, how many total words elementary EFL learners should read and start from which readability levels.

There were several studies, where the benefit of ER was measured with standardized tests. Mason (2004) evaluated the effect of ER with reading section of TOEIC. 104 Japanese college students majoring in English had read about 500 thousand words in three semesters (1.5 years). 88 students' TOEIC/Reading scores were measured as pre-test and post-test, and the average was 121 and 157 respectively. If we assume the same score ratio of reading part and total score: 0.446 (123.64/277.26) was kept, their TOEIC total score was estimated to be 272 and 353 respectively. The score of the post-test, however, remained still in elementary level (< 470), and thus a half million words may not be large enough.

Nishizawa, Yoshioka, and Fukada (2010) reported students' TOEIC score increases in a 4-year long ER program. Their average TOEIC scores were 435 for a group (N = 9) who had read 310 thousand total words in median, 498 for another group (N = 13) who had read 660 thousand words, and 604 for the last group (N = 8) who had read 1.8 million words. For achieving a large enough score gain in the TOEIC test, the students in elementary level had to read a million total words or more in an ER program that lasts more than several years.

A million total words were proposed by Sakai (2002) as a milestone for ER in Japanese EFL settings based on the experience of his ER program for university engineering majors, and were about eight to ten times of the total words read by the university students in Robb and Susser's ER project (1989) who had read 641 pages in average.

There were a few ER programs in which the students actually read the amount close to a million words. Mason's (2004) students, college English-majors read an average of 2,300 pages (about 500 thousand words), and a group of students spent 150 hours reading. Furukawa (2008) reported the average total words read by ninth graders was 680 thousand words in 2.2 years of his ER program. And the average total words were extended to 1.2 million words by 12th graders staying in the sixth-year form of his program (Furukawa, 2011). Nishino (2007) followed the ER of two third-year junior high school students for 2.5 years and they read 36 or 42 graded readers. Their estimated total words by Beglar & Hunt (2014: 31) were 333 and 402 thousand standard words, or 392 and 473 thousand words calculated by the coefficient binding two measures: 0.85 (Beglar & Hunt, 2014: 45). Kanda (2009) studied the ER of a university student for three years, who had read a million words. Nishizawa, Yoshioka, and Fukada (2010) reported that their students' median total words read was 690 thousand words in their 4-year long ER program.

Based on the background, we would like to answer the following practical research questions to evaluate the six-year long ER program for reluctant Engineering students:

- Is it possible to improve Engineering students' average English proficiency from elementary level (TOEIC 300): the estimated level of K9 students to lower-intermediate level (TOEIC 550): the expected level for newly employed university graduates (IIBC, 2015: 23) in a six-year long ER program?
- How many total words of English texts do the students need to read to achieve the target TOEIC score?

- Does the duration of an ER program effect on the students' achievement?

2. Method

The ER program was conducted at one of NIT colleges that was a specialized institution for early engineering education in Japan. There were 57 NIT colleges and their new students occupy about 1% of all K10 students in Japan. The NIT college had five Engineering departments, and each department had a 5-year foundation course (class size from 1st to 5th grade was 40 students each) and a 2-year advanced course (class size for 6th and 7th grade was 4 students each). The college accepted graduates from junior high school, where they had already learnt English for three years. Fresh students' English proficiency was estimated to be around TOEIC 300. From 10 to 20 % of graduates from the foundation course, whose English skills were in middle range of the class, proceeded to the advanced course.

The subjects of this study consisted of twelve cohorts who had entered the foundation course from 2000 to 2011, stayed in the college for seven years, and graduated from the advanced course from 2006 to 2017, which were called from 2006 cohort to 2017 cohort in this study. All of them belonged to the same Engineering department, and attended the ER lessons from three to seven years. The students who had studied abroad or stayed in the college shorter or longer than seven years were excluded from this study. Two students who had read extraordinary amount of English books in the program were also excluded.

English education in the college consisted of traditional and ER lessons (Table 1). The ER lessons had been introduced in 2004 for all six grades from the second to the seventh grade of the course, and 12 students of group A (cohort 2006 – 2008) started their ER in different grades, from the fifth grade for cohort 2006 to the third grade for cohort 2008. From 12 to 19% of their total lessons was ER. 14 students of group B (cohort 2009 – 2011) started their ER lessons in the second grade and attended from five to six units of ER lessons, which was from 18 to 22% of their total English lessons. The students of group C (cohort 2012 – 2013) and group D (cohort 2014 – 2017) stayed in the ER program through the first six or all seven grades in the college. The students of group C took 6.7 units of ER lessons (23 – 25% of their total English lessons), and the students of group D took from 8 to 9 units (29 – 33% of their total English lessons). One unit was a 45-minutes weekly lesson through the year or a 90-minute weekly lesson for half a year. Traditional lessons were five units in the first grade, three or four units in the grades from the second to the fourth and the sixth grade, and one unit in the seventh grade. The units varied by student from zero to two in the fifth grade, which made the variation of lesson units in Table 1.

Table 1. Subjects and English lessons.

Group	A	B	C	D
Cohort	2006 – 2008	2009 – 2011	2012 – 2013	2014 – 2017
N of subjects	12	14	13	11
Traditional	21 – 23	21 – 23	20.3 – 22.3	18 – 20
Units of English lessons	3 – 5 (12 – 19%) from 5 th – 3 rd grades	5 – 6 (18 – 22%) from 2 nd grade	6.7 (23 – 25%) from 1 st grade	8 – 9 (29 – 33%) from 1 st grade
Total	24 – 28	26 – 29	27 – 29	26 – 29

* One unit is a 45-minute weekly lesson for 30 weeks or a 90-minute weekly lesson for 15 weeks

Main ER activity was sustained silent reading (SSR), plus some shadowing, and reading while listening (LR). Shadowing was conducted mostly at the first grade for the students to familiarize English sound. LR was a practice to read English texts along with listening to audio narration of the text. Students were not supposed to pause or interrupt the narration and were force to read the text at the same speed of the narration. They comprehended the story mainly from the texts but not from the narration at first. The narration decided the reading speed, and was expected to protect the students from their habit to analyse English texts grammatically or translate the English texts

into Japanese. It made a good introduction to ER. Around 30% of the students in from second to fifth grades did LR as the in-class activity. Typical reading rate of the third-grade students was around 120 words per minute (WPM). ER lessons from second to fifth grade were done in the college library where the books and portable CD players for LR were kept. The students were not allowed to talk aloud in the library but they could select their books to read directly from the bookshelves and also check them out for out-of-class readings. We have introduced output activities such as writing and speaking into the ER lessons for the sixth and seventh grades since 2015 academic year. They aimed to encourage out-of-class reading because the theme of activities was to talk about a book they had read during the week.

All the students had recorded their reading histories in and out of the class in their logbooks, which were periodically reviewed by the teachers. Typically they were collected a day or two before a lesson, examined by the teacher and added a comment or a message, and returned to the students at the beginning of the lesson. Each record contained the date, title, series name, readability level and word count of the book, cumulated total words, five-graded subjective evaluation of the story, and short comment describing what the students thought about the story or how they felt about their reading.

We used the total score of TOEIC tests to evaluate English proficiency of the students because the test had high reliability necessary for a long-term study and was sensible to English skills of elementary and intermediate levels, and students' scores of reading section and listening section increased in balance in the past studies (e.g., Nishizawa, Yoshioka & Fukada, 2010). All the students took at least two TOEIC tests in the middle of their third and sixth grades. From the date of the tests and total words at the tests recorded in student's reading log, we could analyse the relation of each student's total words and TOEIC scores to estimate the expected TOEIC scores when they would read a million words. We also analysed the influence of duration the students stayed in the ER program.

3. Results

The total words read by the students were shown in Table 2. They were expressed in median to avoid the influence of a few students who had read outstanding amount or skewedness.

Table 2. Total words read (Median, thousand words).

Group	A	B	C	D
Cohort	2006 – 2008	2009 – 2011	2012 – 2013	2014 – 2017
N of subjects	12	14	13	11
3 rd grade	–*1	410*2 (in 1.5 years) 273 / year	484 (in 2.5 years) 194 / year	679 (in 2.5 years) 272 / year
6 th grade	372 (in 1.5 – 3.5 years)	629 (in 4.5 years) 140 /year	1,000 (in 5.5 years) 182 /year	1,220 (in 5.5 years) 222 / year
7 th grade	770*3 (in 3 – 4 years)	1,060*4 (in 6 years) 177 / year	1,300 (in 7 years) 186 / year	2,240*5 (in 7 years) 320 /year

*1 no record was available, *2 three students of cohort 2011, *3 two students of cohort 2006 and four students of cohort 2007, *4 one student of cohort 2009 and three students of cohort 2010,

*5 one student of cohort 2014 and three students of cohort 2016

The students of group A, who had joined the ER program from the third to fifth grades, read 372 thousand words of easy-to-read English texts during from 1.5 to 3.5 years until they took the TOEIC tests in the middle of the sixth grade. Six students continued the ER lesson in the seventh grade and read 770 thousand total words in the program. The students of group B joining the ER lessons in the second grade read 629 thousand words in 4.5 years. Four students continued the ER lesson to the seventh grade and read 1.06 million total words in the program. The students

of group C had joined the ER lessons in the first grade, read 484 thousand words in the first 2.5 years, 1.0 million words until the middle of the sixth grade, and 1.3 million words until the end of the seventh grade. The students of group D had taken five units of ER lessons in the first three grades, read 679 thousand words in 2.5 years and 1.22 million words until the middle of the sixth grade. Four students continued the ER lesson to the seventh grade and read 2.24 million total words in the program.

All the students took the TOEIC tests in the middle of the sixth grades, and the students of group B, C and D took the test also in the middle of the third grade (Table 3). There were no significant differences among the average TOEIC scores of three groups in the third grade. Additional 269 thousand words of ER cumulated by transforming 2.5 units of traditional lessons into ER in the first 2.5 years did not increase the average TOEIC score of group D compared to group B.

Table 3. TOEIC score (average ± standard deviation) and yearly increase rate.

Group	A	B	C	D
Cohort	2006 – 2008	2009 – 2011	2012 – 2013	2014 – 2017
N of subjects	12	14	13	11
3 rd grade	–*1	378 ± 59	348 ± 29	380 ± 68
6 th grade	411 ± 58	491 ± 74 +38 / year	484 ± 51 +45 / year	490 ± 80 +37 / year
7 th grade (N)	468 ± 70 (6 ^{*2})	540 ± 32 (4 ^{*3})	548 ± 69 +43 / year	575 ± 54 (4 ^{*4})

*1 TOEIC tests were not taken, *2 two students of cohort 2006 and four students of cohort 2007,

*3 one student of cohort 2009 and three students of cohort 2010,

*4 one student of cohort 2014 and three students of cohort 2016

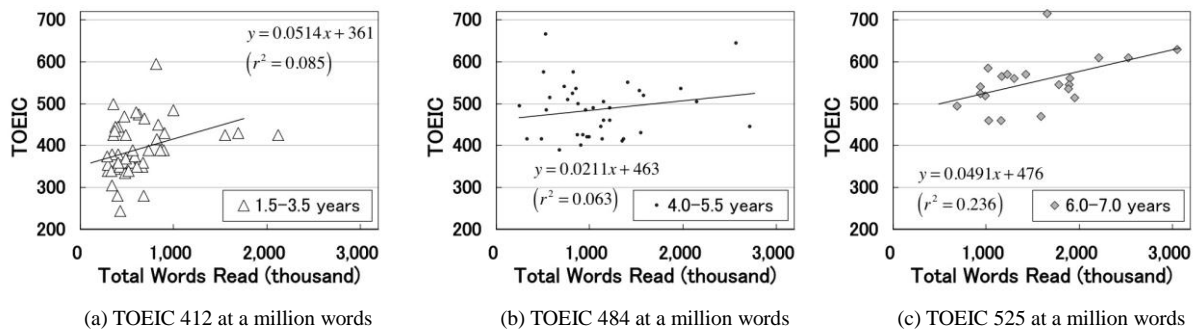


Fig. 1. Relation of total words read and the TOEIC score.

In the sixth grade, the differences of the average scores of group A and the other groups were statistically significant ($t < 0.01$), but the differences among groups B, C, and D were not. 591 thousand words of ER, which was added by transforming three units of traditional lessons into ER in the first three years, did not increase the average TOEIC score of group D compared to group B. In the seventh year, there were differences between the average score of group A and the other groups B, C, and D ($0.014 < t < 0.032$) although the sample sizes were small except group C. Comparison between group B and D was inappropriate because of the small data sizes of both groups.

Although the student who had read more tended to get higher TOEIC score, there was also an influence of the duration of an ER program. To clarify the influence of the duration more in detail, we divided the samples into three ranges of ER duration and analysed the distribution of the total words read and TOEIC scores separately (Fig. 1). First range of ER duration was from 1.5 to 3.5 years (Fig. 1(a)). Three samples from group B and all samples from

groups C and D in the third grade belong to this range. All samples of group A in the sixth grade and six samples of the seventh grade also belonged to this range. Second range was from 4.0 to 5.5 years (Fig. 1(b)), and all samples from group B, C, and D in the sixth grade belonged to this range. Third range was from 6.0 to 7.0 years (Fig. 1(c)). Four samples from group B, all samples from group C, and four samples from Group D in the seventh grade belonged to this range.

The students who stayed in the ER program longer tended to have higher TOEIC scores than the students who stayed shorter period if they had read the same amount. The regression lines of three ER durations in Fig. 1 were far apart, and the expected TOEIC scores when a student would read a million words were 412 for the duration of 1.5 – 3.5 years, 484 (+72) for the duration of 4.0 – 5.5 years, and 525 (+41) for the duration of 6.0 – 7.0 years. The students stopped to hesitate in speaking or writing about their recent reading experiences when they stayed in the program for six or more years. Their phrases or sentences were not always accurate but they did not need long pauses, which many EFL learners needed for translating what they wanted to say in English. They did not seem to have anxiety for using the language.

4. Discussions

The ER program in this study demonstrated it was possible to improve Engineering students' average English proficiency from elementary level (TOEIC < 400) to lower-intermediate level (TOEIC 550). It needed, however, the duration of seven years as shown in the average score of group C in the seventh grade (TOEIC 548). Six years were not long enough, as the average TOEIC scores of all four groups did not exceed TOEIC 500 at the sixth grade, and an additional year made an apparent difference.

Increasing ER lesson units from once a week to twice a week in the second and third grades did not increase the TOEIC scores measured in the sixth grade as the TOEIC score of group D (490) was not higher than the one of group C (484) even though the total words read increased from 1.0 million words of group C to 1.22 million words of group D. The yearly reading pace of group C (186 thousand words per year) might be high enough because the proposed yearly pace by Nation (2014) was 171 thousand words per year for meeting 2nd 1,000 word families twelve repetition in average and learn the vocabulary incidentally.

The duration of the ER program had larger influence upon the students' achievement once the reading pace was kept through the ER program. ER duration of seven years was also supported by the questionnaire to nine students in 2013 cohort (Nishizawa and Yoshioka 2015) that "they felt that that they could read English texts fluently when they had read 821,000 words in 4.0 years, and they felt that they could avoid Japanese in reading English texts when they had read 876,000 words in 4.3 years in average. To either of the questions, the slowest learner answered that they needed 6.5 years to feel that way."

Table 4. Comparison of the learning histories of three groups.

Group		A	B	B
Grade		6 th	6 th	3 rd
N of subjects		12	14	14
Duration of ER		1.5 -3.5 years	4.5 years	1.5 years
Units of English lessons	Traditional	19 – 21	19 – 21	12
	ER* ¹	1.5 – 3.5	4.5	1.5
	Total	20.5 – 24.5	23.5 – 25.5	13.5
Total words (thousand)		372	629	410* ²
TOEIC		411 ± 58 base	491 ± 74 <i>t</i> = 0.002	378 ± 59 <i>t</i> = 0.08

*1 the units of ER lessons are equal to the duration of ER lessons for group A and B,

*2 three students of cohort 2011

One million total words was not enough to achieve the target TOEIC score (550) because the students of group C needed to read 1.3 million words in median to receive TOEIC 548 in average at the seventh grade. 1.3 million total words could be reached at the end of seven years with the reading pace of 186 thousand words per year.

It was hard to explain the higher TOEIC scores of elder students by the increased units of concurring traditional lessons. Of course, the students of group B at the sixth grade had longer duration of ER *and* more units of traditional lessons than the students of group B at the third grade (the middle and right columns of Table 4).

However, the comparisons of the students of group A at the sixth grade with the students of group B at the sixth and third grades showed larger influence of the duration upon the units of traditional lessons. Firstly, significantly higher ($t < 0.01$) TOEIC average of group B (6th grade) over group A (6th grade) could not be explained by the same units of traditional lessons but the longer duration of ER program or larger total words read by the students.

Secondly, the difference of TOEIC average between group A (6th grade) and group B (3rd grade) was insignificant ($t > 0.05$) even though group A (6th grade) had 58 – 75% more units of traditional lessons. The duration of ER lessons of both groups were shorter than four years and the total words read by the students were almost the same. More (7 - 9 units) traditional lessons of group A (6th grade) could not cause significantly higher average TOEIC score than the one of group B (3rd grade).

Limitations of this study are firstly its sample size. We have to assume the estimation is rather inaccurate. Further studies may find shorter or longer duration of an ER program necessary to achieve the TOEIC 550 target as five years or eight years instead of the seven years. Secondly, this study assumes that the concurrent traditional lessons, at least their effect on TOEIC scores, stayed the same for more than ten years. We do not count the unknown effect of improvement in concurrent traditional lessons. We only presume the same small change as the small change of national average in TOEIC scores (IIBC, 2015). Thirdly, the recommended duration of an ER program may depend on the initial English proficiency of the students. It is highly probable that more proficient EFL students need shorter duration than seven years to achieve the same goal.

5. Conclusions

A long-term ER program at a Japanese technical college demonstrated it possible to improve engineering students' English proficiency from elementary level to lower-intermediate level with 45-minute weekly ER lessons for consecutive seven years. The students who had read 1.3 million total words of easy-to-read English texts with a yearly pace of 186 thousand words had the average TOEIC score of 548 at the end of the program. Six or seven years of the duration had an apparent advantage upon shorter duration of three years. They became free from anxiety and eager to use the language for their communication.

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