Input and Output in Japanese High School Government-Approved English Textbooks

日本の高等学校英語検定教科書における インプットとアウトプット

Rie Sugiura[1], Noriko Imai[2], Mark Hamilton,[1] Eric Dean[1], Robert J. Ashcroft[1]
杉浦 理恵[3], 今井 典子[4], ハミルトン マーク[3],
ディーン エリック[3], ロバート ジョン アシュクロフト[3]

Abstract

The purpose of this research is to analyze government-approved English textbooks for Japanese high school students in terms of input and output, and to propose English teaching materials with more effective activities for language learning. For the textbook analysis, government-approved textbooks from six different publishers were selected. Two levels of textbooks from each publisher were targeted for our research, meaning a total of 12 textbooks were analyzed. The research and results analysis will provide valuable insights for curriculum developers and teachers who make lesson plans or teaching materials, especially task-based activities for Japanese high school English classes[5].

要 旨

本研究では、日本の高等学校英語科の検定教科書をインプットとアウトプットの観点から分析し、より言語習得に効果的な言語活動を教科書に基づいて提案することを目的としている。分析対象は、高等学校の 1 年生と 2 年生で使用されている 6 社の教科書、合計 12 冊とした。分析結果をもとに、カリキュラム開発者や教員が指導案作成や教材を開発する際、特にタスクを中心とした言語活動を実施する場合に考慮すべき点を論じる。

Keywords: English textbooks, vocabulary, readability, communication activities, Bloom’s Taxonomy

[1] 東海大学国際文化学部国際コミュニケーション学科，005-8601 札幌市南区南沢 5 条 1 丁目 1-1 ; E-mail: rsugiura@tsc.u-tokai.ac.jp
[2] 高知大学人文社会科学部人文社会科学科国際社会コース，780-8520 高知市曙町 2 丁目 5-1
[3] Department of International Communications, School of International Cultural Relations, 5-1-1-1 Minamisawa, Minami-ku, Sapporo 005-8601, Japan; E-mail: rsugiura@tsc.u-tokai.ac.jp
[4] Department of Humanities and Social Sciences, International Studies Course, Kochi University, 2-5-1 Akebono-cho, Kochi City, Kochi, 780-8520, Japan
[5] The earlier version of this paper was presented at International Symposium on Language, Linguistics, Literature and Education held in Fukuoka, 2019. Sugiura, R., Imai, N., Hamilton, M., & Dean, E. (2019)

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ブルームの分類学

1. Introduction

English education in Japan will change from the academic year 2020 with the official introduction of Foreign Language Activity classes in 3rd grade and English as a subject in 5th grade at elementary schools. The Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) has determined new *Courses of Study* for all school levels. The newly proposed *Courses of Study* (MEXT, 2018) states that, "independent, interactive, and deep learning" (p. 3, translated by the authors) is the key to improving the quality of education in Japan. Since this applies to all subjects, it is necessary to consider how the improvement can be realized especially in English classes at high schools. In high schools across Japan, the use of government-approved textbooks is mandatory and most of the language input students receive is from these textbooks. As Ellis (2008) states, input, output and interaction play important roles for language learning. Thus, language resources and communication activities in the textbooks must be carefully designed, particularly in an EFL (English as a Foreign Language) context such as Japan, where opportunities for L2 input, output and interaction are fewer compared to ESL (English as a Second Language) contexts.

This research aims to ascertain which input and output opportunities should be provided to high school students through textbooks in order to achieve the objectives of the new *Courses of Study*. The discussion is based on the analysis results of government-approved English textbooks currently being used in Japanese high schools. The analysis was conducted in terms of the vocabulary level, readability, and cognitive demand of output activities. In the following sections, the theoretical rationale is explained, and initial research results are reported. Finally, issues relating to effective language input and output activities using the textbooks are discussed.

2. Background

Each academic year, language teachers must update their course syllabi and decide which textbooks to use. This difficult decision is often made during the busy grading period at the end of term, and many teachers rely on subjective and intuitive judgements about what will work. At the same time, teachers are aware that a mistake in textbook selection can lead to disinterested students, limited learning, and an increased workload later on due to the need to find more engaging supplemental materials and activities. Some textbooks use smaller fonts and therefore teachers might be inclined to think that they are more difficult. In order to select appropriate textbooks for students, it is necessary to consider issues such as the need for a gradual progression of challenge of language input such as vocabulary level and readability of texts, and opportunities for output in order to effectively facilitate language acquisition.

As for input, Ishikawa (2009) states that the vocabulary presented in the textbooks can affect students' vocabulary acquisition (p. 165). Hasegawa, Chujo, and Nishigaki (2008) examined vocabulary in government-approved English textbooks for Japanese junior and senior

high schools during a 30-year period spanning the 80's, 90's and 00's. Their findings show that an increase in the total number of vocabulary types in the textbooks does not always lead to an increase in the number of the vocabulary types necessary for effective communication. These findings of vocabulary studies indicate that the types used in textbooks should be one of the issues considered when compiling textbooks. Therefore, teachers need to consider the vocabulary level of the textbooks.

Readability, which indicates how easy or difficult texts can be read, should also be considered. Krashen (1995) proposes "the Reading Hypothesis" (p. 187), which asserts that comprehensible input through reading is the major source of students' literacy development. In other words, reading texts for meaning at an appropriate level contributes to language acquisition. If then readability of textbooks is set appropriately for students, progressing through each grade, learning will automatically happen as a result.

Like input, the role of output in language acquisition can also not be dismissed. A theoretical framework from cognitive accounts indicates that a portion of intake converted from comprehended input is used to develop implicit knowledge or an interlanguage system, and this system contributes to output (Ellis, 1994). VanPatten and Sanz (1995) studied the effects of instruction at the processing stage of input by examining the production data after the instruction. They found a positive effect for processing instruction on the grammatical accuracy of both oral and written output. Although their study is concerned with grammar acquisition, it shows the undeniable relationship between the processing input and producing output.

An assessment of textbook effectiveness must take into account opportunities for student output. As mentioned above, MEXT (2018) encourages "independent, interactive, and deep learning" (p. 3) using active learning. Although active learning has recently been the focus of renewed attention in Japan, it is by no means a new concept. John Dewey (1916), the American educational philosopher, said that if teachers "give the students something to do, not something to learn; and the doing is of such a nature as to demand thinking; learning naturally results" (p. 154). In other words, students learn better when actively involved in a task.

To actively engage students and promote learning, a number of researchers have proposed the effectiveness of *tasks* in English class (e.g.,Ellis, 2003; Nunan, 1989; Skehan, 1998; Willis, 1996). Tasks provide a purpose for the use and learning of language other than simply learning language items for their own sake. Nunan (1989) defines a task as "a piece of classroom work which involves learners in comprehending, manipulating, producing or interacting in the target language while their attention is principally focused on meaning rather than on form" (p. 4). Although researchers use different definitions of a task, Ellis (2003) identifies the criterial features as follows: A task ...

1. ... is a workplan.
2. ... involves a primary focus on meaning.
3. ... involves real-world processes of language use.
4. ... can involve any of the four language skills.

5. ... engages cognitive processes.
6. ... has a clearly defined communicative outcome.

(Ellis, 2003, pp.9-10)

According to Ellis (2003), learners must encounter opportunities to experience meaning-focused language use to develop L2 proficiency necessary for fluent and effective communication. Furthermore, Ellis's criterial features of a task include engagement of cognitive processes. With regard to this, Bloom (1956) first proposed a taxonomy of educational objectives in order to classify outcomes in different institutional programs. Later, Anderson et al. (2001) revised Bloom's taxonomy, relabeling the original six categories. In the language teaching setting, Bloom's revised taxonomy has gained attention since Content and Language Integrated Learning (CLIL) has grown in popularity. Dale and Tanner (2012) demonstrate the revised taxonomy can be used to create tasks or questions that demand the use of higher-order thinking skills (HOTS), or lower-order thinking skills (LOTS). Figure 1 shows the revised taxonomy with associated verbs.

Figure 1
The Revised Taxonomy with Associated Verbs and Necessary Skills
(adapted from Dale & Tanner, 2012, pp. 32-33)

Higher-Order Thinking Skills

Create	*construct, create, design*
Evaluate	*argue, judge, evaluate*
Analyze	*compare, contrast, criticize, test*
Apply	*demonstrate, dramatize, illustrate*
Understand	*describe, explain, paraphrase*
Remember	*tell, recall, repeat, list*

Lower-Order Thinking Skills

In light of the existing research, this paper further assesses whether input provided in the textbooks is appropriate to foster the communicative ability of high school students, and which activities engage students in deeper cognitive processes. In particular, at high school level, communicative and practical input and output activities are essential to activate the latent English skills which students have acquired leading up to high school.

3. Method

There are many series of government-approved English textbooks for high school. In this study,

textbooks used in two subjects, “Communication Eigo I” and “Communication Eigo II”, were analyzed[6]. There were 34 textbooks for “Communication Eigo I”, and 42 textbooks available for “Communication Eigo II” (MEXT, 2017). In order to select the textbooks to analyze, the popularity of the textbooks used in the Ishikari region of Hokkaido, was considered, referring to information provided by the Hokkaido Government Board of Education (n.d.). When more than one textbook series by the same publisher was highly popular, only one series was selected. Moreover, after deciding on the five textbooks series to analyze, one textbook series which is used at an affiliated high school of the authors’ university was added[7].

As a result, six government-approved textbook series, each one from a different publisher, were chosen for analysis, giving a total of 12 textbooks as the focus of this study. Table 1 gives the names of the 12 textbooks used.

Table 1

Textbooks Used in the Present Study

Textbook I	**Textbook II**	**Publishers**
Big Dipper I	*Big Dipper II*	Suken Shuppan
Flex I	*Flex II*	Zoshindo
Landmark I	*Landmark II*	Keirinkan
My Way I	*My Way II*	Sanseido
New One World I	*New One World II*	Kyoiku Shuppan
Vivid I	*Vivid II*	Daiichi Gakushusha

The analysis was conducted in terms of the linguistic input and output for each textbook and also for each unit within each textbook. In order to analyze linguistic input, only the main passages in the textbooks were examined, thereby excluding conversation examples, exercises, and optional reading texts. A scanner with text recognition software was used to create digital files of the text. A number of the textbooks contained units which included conversational dialogues. These dialogues were omitted from the study. Unit titles were also omitted from the analysis, focusing only on the body text of each unit. The analysis method of vocabulary level, readability, and cognitive demand of output activities will be described in detail in the following sections.

3.1 Language Input

3.1.1 Vocabulary Level

The texts were examined using vocabulary profiling and reading ease analysis. Vocabulary was analyzed using a free, online vocabulary concordancing and profiling application called *Lex Tutor* (Cobb,

[6] “Communication Eigo I” and “Communication Eigo II” are the subjects under the current *Courses of Study* (MEXT, 2009).

[7] For future research, creating materials based on this textbook analysis, and actually using them at high school will be important to contribute towards more effective English education. Thus, textbooks used in the Ishikari region and an affiliated high school were selected to utilize the results in creating new materials.

n.d.), designed by Dr. Tom Cobb of the University of Quebec at Montreal. A complete vocabulary profile for each textbook, and also each unit within each book, was made. Text was pasted directly into the *VocabProfile* of the *Lex Tutor* website. Results from the site gives the total number of words in a text (tokens), the total number of different kinds of words in a text (types), and the total number of word families in a text. A word family is a group of words with a common stem to which different suffixes, prefixes and inflections can be added. *Lex Tutor* also breaks down this data according to frequency bands. For example, the analysis gives information about how many types, tokens, or word families there are in the text from the one thousand most common words in English (K-1), and the second most common thousand words (K-2), and so on. The frequency bands used in the present study were based on the British National Corpus (BNC) and Corpus of Contemporary American English (COCA). *Lex Tutor* also provides information on the lexical density of a text. Lexical density attempts to quantify the linguistic complexity in a text using the number of functional (grammatical) words and content words. The higher the proportion of content words, the more lexically dense and therefore more challenging the text is likely to be. This study examined tokens, types, word families according to K-frequency bands, and lexical density. The results of these analyses should indicate how lexically challenging a textbook will be for students. For example, if the textbook contained many items from lower frequency bands then it would call into question the suitability of the text for language learners on the assumption that higher frequency words are both the most useful and easiest to learn.

3.1.2 Readability

The *Flesch Reading-ease Test* (Flesch, 1981) and the *Flesch-Kincaid Grade Level Test* (Kincaid, et al., 1975) were used as an additional measure of the difficulty level of the textbooks. These tests are simple to carry out using Microsoft Word. In the *Flesch Reading-ease Test*, scores range from a maximum of 100 and minimum of 0. Lower scores mean a passage is more difficult to read, higher scores indicate that the passage should be easier. In contrast, the *Flesch–Kincaid Grade Level Test* presents the score in terms of the American school grade level. The higher the school year, the more challenging is the text.

3.2 Output Activities

Cognitive demand of activities was examined based on Bloom's revised taxonomy (Dale & Tanner, 2012) as discussed in Section 2. Each unit has output activities at the end, and the authors first identified which output activities in each of the 12 textbooks should be examined. The cognitive demand of these activities was then independently analyzed by the authors, a native English teacher and a Japanese teacher of English. In the analysis, the cognitive skills from Bloom's Taxonomy included in each activity were determined. For instance, when output activity in each unit induces students to remember, one point was given to remembering skill. Some activities could induce students to use several skills. In such cases, one point was given to each skill category. Brief notes were also taken explaining the analysis related to the level of skills.

4. Results Analysis

The results of vocabulary level, readability, and cognitive demand of output activities will be shown

respectively in the following sections.

4.1　Language Input

4.1.1 Vocabulary Level

The vocabulary profiles provided information about how many types, tokens, and word families there are in the text from the K1, K2 and K3 frequency bands. Figure 2 and Figure 3 show the tokens and types for the six books in Textbook I. It shows extensive coverage with a high percentage of text falling within the K-1 to K-3 frequency bands.

Figure 2

Tokens for K1, K2 , K3 for Textbook Ⅰ

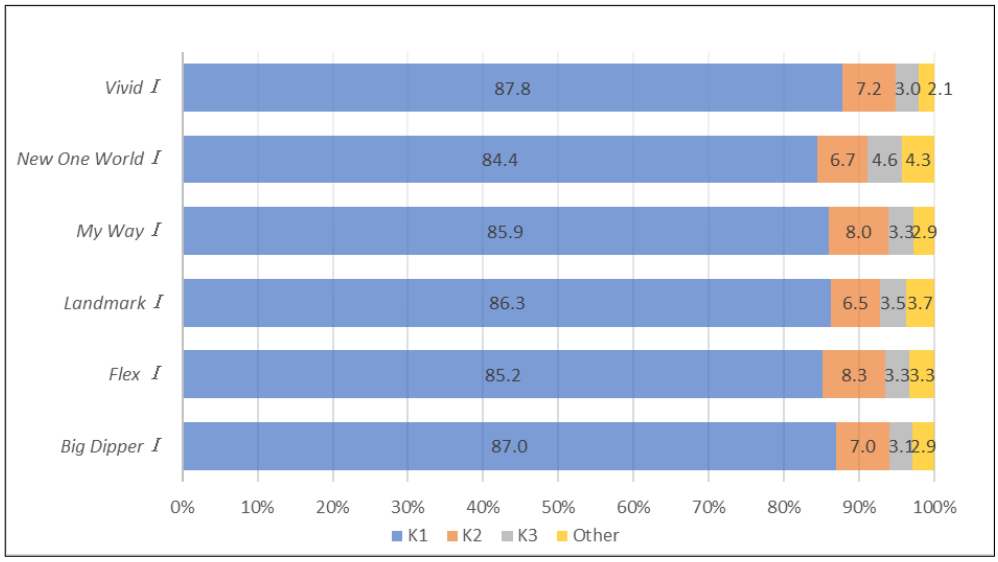
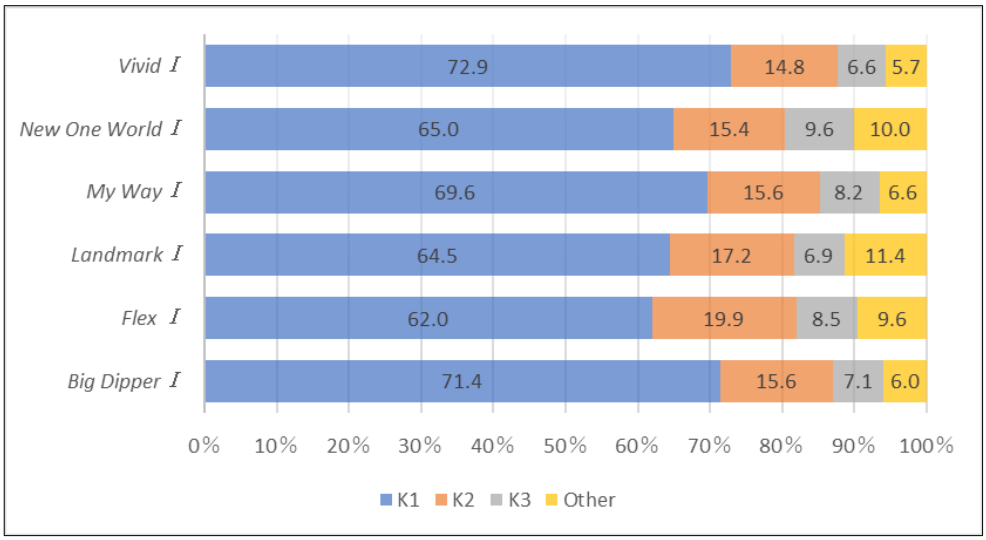


Figure 3

Types for K1, K2 , K3 for Textbook Ⅰ



Likewise, the six textbooks analyzed in Textbook II in terms of tokens also had extensive coverage across

the K-1, K-2, and K-3 frequency bands (Figure 4), although the types had less coverage (Figure 5).

Figure 4

Tokens for K1, K2, K3 for Textbook II

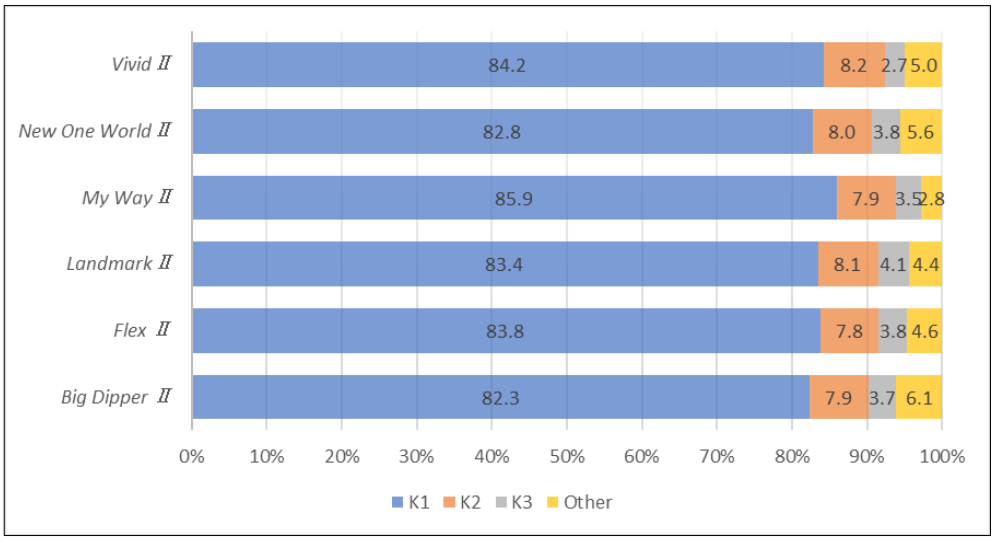
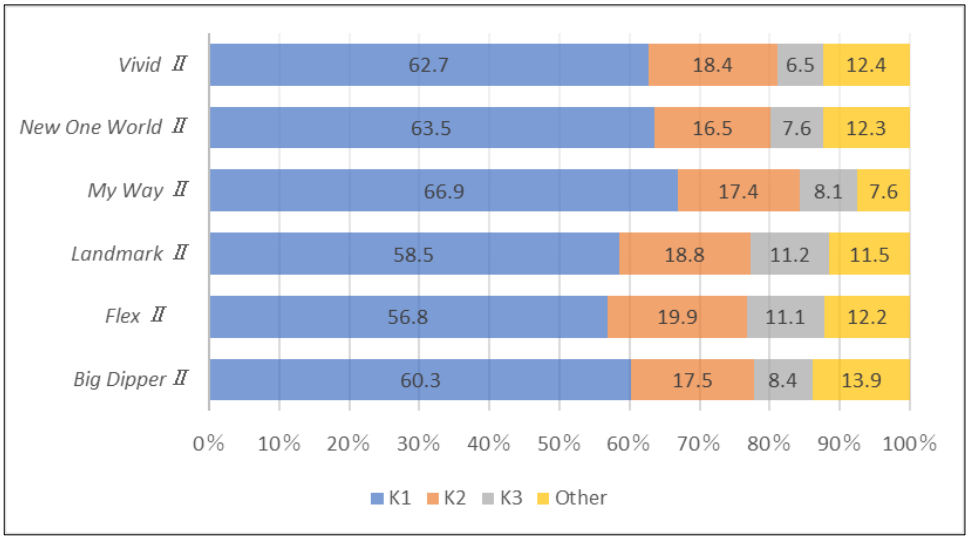


Figure 5

Types for K1, K2, K3 for Textbook II



In summary, the analysis of tokens and types in both Textbook I and Textbook II revealed the following results:

1. More than 93.9 % of tokens used in 12 textbooks are K1, K2 and K3 words.
2. More than 90.2 % of tokens used in 12 textbooks are K1 and K2 words.
3. More than 82.3 % of tokens used in 12 textbooks are K1 words.
4. More than 86.2 % of types used in 12 textbooks are K1, K2 and K3 words.
5. More than 76.7 % of types used in 12 textbooks are K1 and K2 words.
6. More than 56.8 % of types used in 12 textbooks are K1 words.

The vocabulary profile data shows that these texts are well-balanced because more than 93.9 % of tokens used in 12 textbooks cover K1, K2 and K3 words of the British National Corpus and American COCA. However, a comparison of the tokens of Textbook I and Textbook II levels shows that there is only small progression from Textbook I to Textbook II. In terms of vocabulary types, Textbook II level used more vocabulary types other than K1, K2 and K3 compared to Textbook I level.

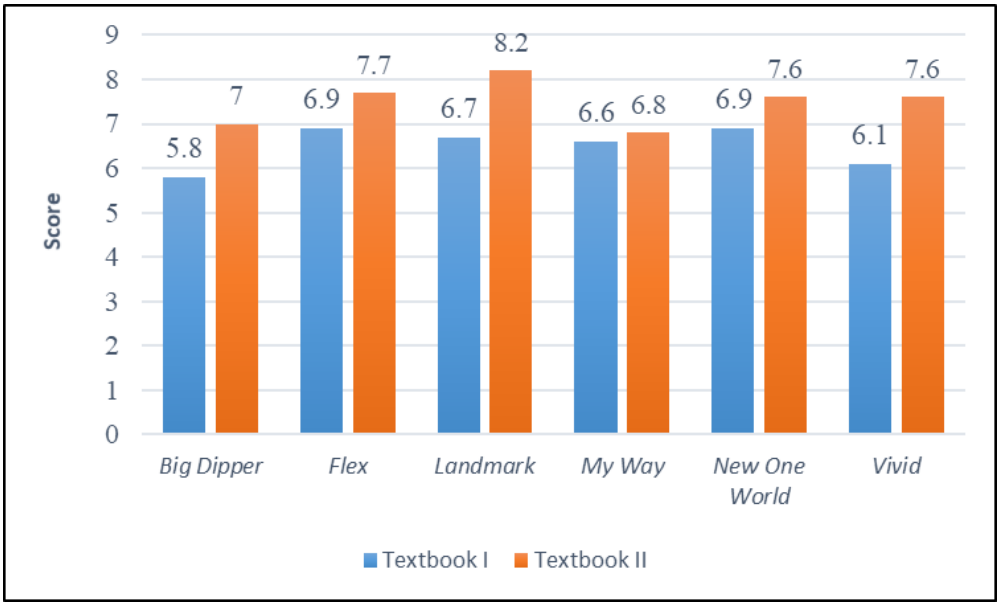
4.1.2 Results of Readability

The *Flesch-Kincaid Grade Level Test* results are shown in Figure 4. The score indicates a certain grade level of the American school. Each level is used to score materials from the upper elementary level through the secondary grades and beyond. A higher score indicates a more difficult level to read than a lower score.

Figure 6 shows the readability of the six different textbooks used in Textbook I and the six textbooks used in Textbook II. The graph allows a comparison between Textbooks I and II. On the whole, the score is slightly higher for Textbook II than Textbook I. The largest score is an average of 8.2 in Textbook II. This is equivalent to a grade level of 8. The lowest score is an average of 5.8 in Textbook I, which is equivalent to a grade level of 6.

Figure 6

Average Readability Scores for All Units of Each Textbook



The readability scores of each unit for each textbook in both the Textbooks I and II levels are presented below. Table 2 and Figure 7 show the compiled information for all of the Textbook I levels. Each readability score varies with each unit. Regarding Textbook I, there is a range in readability scores from 3.9 to 9.1, equivalent to grade levels 4th to 9th.

Table 2

Readability Scores of Each Unit for Each Textbook in Textbook I

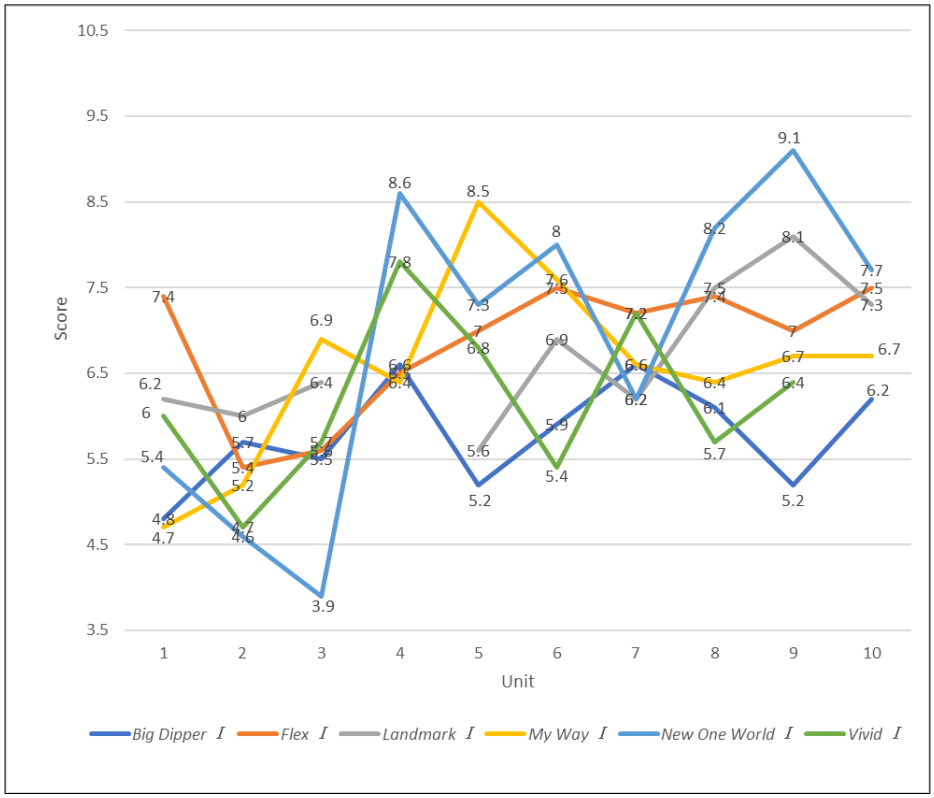
Unit	*Big Dipper I*	*Flex I*	*Landmark I*	*My Way I*	*New One World I*	*Vivid I*
1	4.8	7.4	6.2	4.7	5.4	6
2	5.7	5.4	6	5.2	4.6	4.7
3	5.5	5.6	6.4	6.9	3.9	5.7
4	6.6	6.5	N/A	6.4	8.6	7.8
5	5.2	7	5.6	8.5	7.3	6.8
6	5.9	7.5	6.9	7.6	8	5.4
7	6.6	7.2	6.2	6.6	6.2	7.2
8	6.1	7.4	7.5	6.4	8.2	5.7
9	5.2	7	8.1	6.7	9.1	6.4
10	6.2	7.5	7.3	6.7	7.7	None

Note. N/A means the analysis is not applicable since the unit has a dialogue.

The highest and lowest scores are underlined. *Vivid I* has only nine units.

Figure 7

The Readability of Each Unit for Each Textbook in Textbook I



Similarly, Table 3 and Figure 8 show the results for all of the Textbook II levels. Regarding Textbook II, there is a range in the scores from 5 to 10.6 which are equivalent to grade levels from 5th to 11th.

Table 3

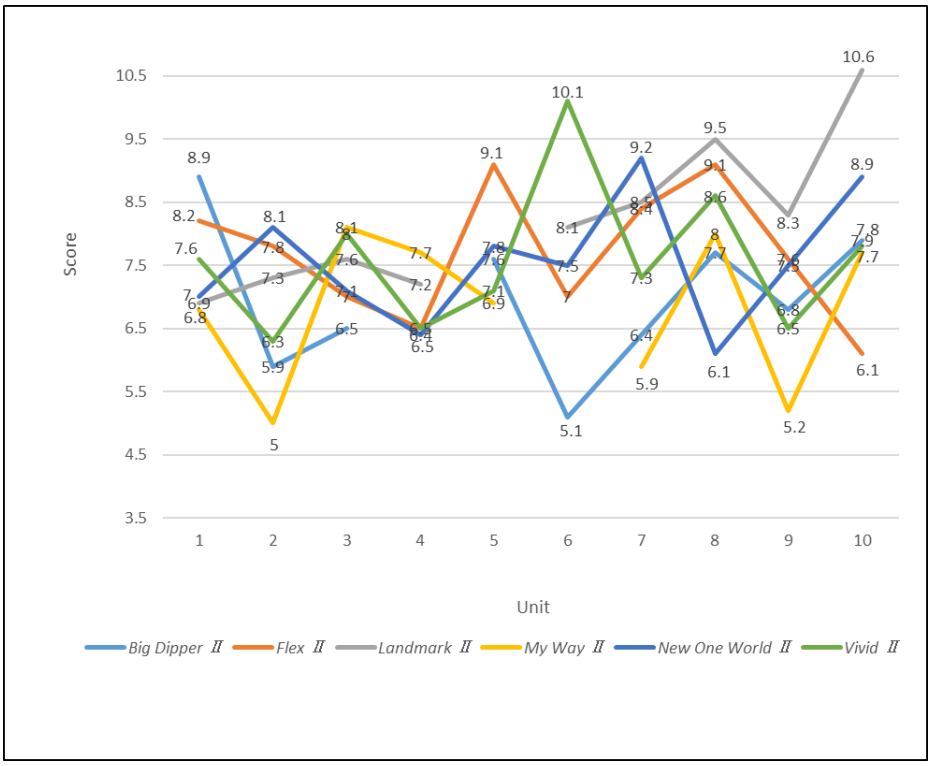
Readability Scores of Each Unit for Each Textbook in Textbook II

Unit	*Big Dipper II*	*Flex II*	*Landmark II*	*My Way II*	*New One World II*	*Vivid II*
1	8.9	8.2	6.9	6.8	7	7.6
2	5.9	7.8	7.3	5	8.1	6.3
3	6.5	7	7.6	8.1	7.1	8
4	N/A	6.5	7.2	7.7	6.4	6.5
5	7.6	9.1	N/A	6.9	7.8	7.1
6	5.1	7	8.1	N/A	7.5	10.1
7	6.4	8.4	8.5	5.9	9.2	7.3
8	7.7	9.1	9.5	8	6.1	8.6
9	6.8	7.6	8.3	5.2	7.5	6.5
10	7.9	6.1	10.6	7.7	8.9	7.8

Note. N/A means the analysis is not applicable since the unit has a dialogue.
The highest and lowest scores are underlined.

Figure 8

The Readability of Each Unit for Each Textbook in Textbook II



In both Figures 7 and 8, each textbook shows a fluctuating pattern of increasing and decreasing scores. Moreover, it can be seen that each graph curve in them is only slightly increasing. This means there is not a gradual progression from one unit to the next.

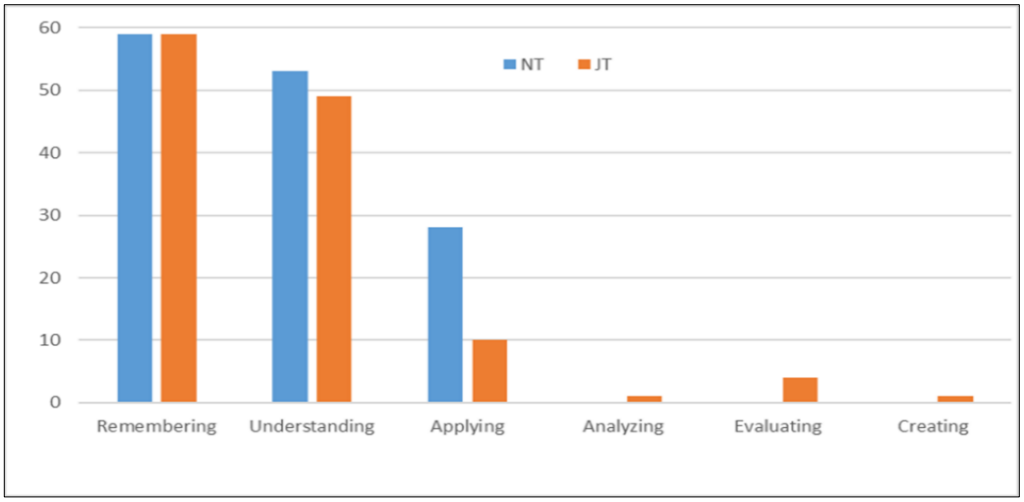
4.2 Output Activities

Two authors analyzed the cognitive demand of these activities independently, and then discussed the results as explained in Section 3.2. However, the cognitive demand of some activities could not be agreed upon since the instructions in the textbooks were vague. Thus, Figure 9 and Figure 10 show the results of each author separately.

Although the number of activities each author checked for the requirement of cognitive demand was slightly different, the results clearly show that most activities in both Textbook I (Figure 9) and Textbook II (Figure 10) focus on lower level cognitive skills.

Figure 9

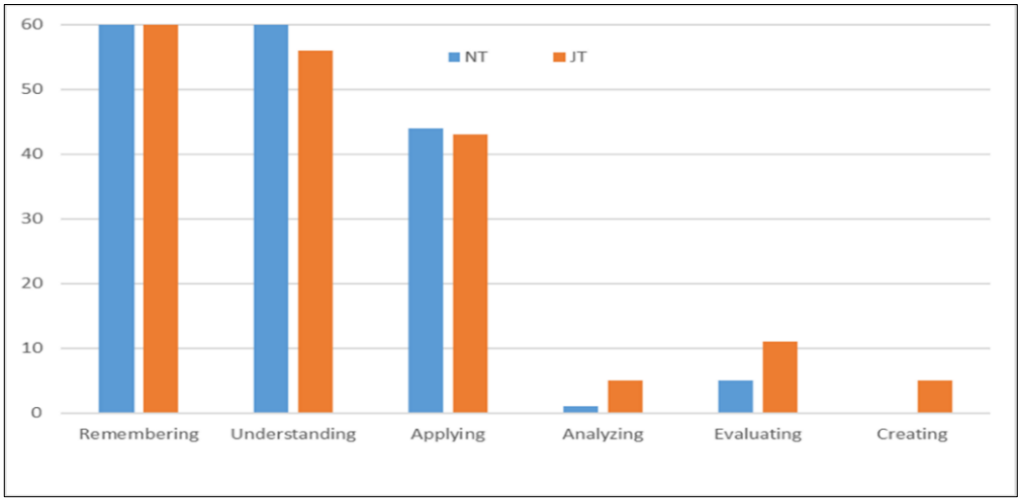
Results of Cognitive Demand of Textbook Ⅰ



Note. NT means the analysis of a native English teacher and JT means the analysis of a Japanese English teacher.

Figure 10

Results of Cognitive Demand of Textbook Ⅱ



Note. NT means the analysis of a native English teacher and JT means the analysis of a Japanese English teacher.

When examining the format and type of activities, each series of textbooks tended to repeat the same format or style of activities throughout most units and there was little evidence of progression of cognitive demand from one unit to the next, nor from Textbook I to Textbook II. For instance, the same format for output activities, for example presentation and discussion were repeatedly used in a textbook. In addition, many of the output activities did not meet the criterial features of a task (see Section 2). For example, students are asked to exchange their ideas about the topic without a clearly defined communicative outcome.

5. Discussion

In terms of vocabulary difficulty, it was found that the 12 textbooks are appropriately challenging and thus suitable for Japanese high school students of English. The percentage of token which covers the British National Corpus and American COCA shows the vocabulary presented in the textbooks can be used practically. However, the percentage of tokens in both Textbook I and Textbook II levels did not show a clear progression. On the other hand, types in Textbook II level had more vocabulary from the frequency bands other than K1, K2, and K3. This means the vocabulary used in Textbook II level was more advanced than that of Textbook I.

As for readability, results indicate the score as a whole is slightly higher for Textbook II than Textbook I. However, results indicate each textbook shows a fluctuating pattern of increasing and decreasing readability. While each graph curve within them is only slightly increasing, raising the readability level gradually from one unit to the next, or from Textbook I to Textbook II would assist in improving students' reading comprehension skills. Readability level should ideally increase gradually from one unit to the next, or from Textbook I to Textbook II in order to continue challenging students as their ability improves. However, it does not mean that a low grade-level readability score makes a text objectively more or less appropriate. As Nation (2009) mentions that reading is a source of learning and a source of enjoyment, students can gain skill and fluency in reading through reading texts, and thereby their enjoyment can increase. Since a lower readability score makes a text more accessible to students, such texts easily provide a source of meaning-focused input.

In terms of output activities, most activities focus on lower-order thinking skills, and there seems to be little or no progression from lower-order thinking skills to higher-order thinking skills from one unit to the next, nor from Textbook I to Textbook II. If students only have opportunities to use lower-order thinking skills, they are less likely to develop higher-order thinking skills. Furthermore, one significant discovery from the independent analysis by a native English teacher and a Japanese teacher of English was the slight difference in interpretation of some activity instructions. For example, one activity in Textbook I instructs students to recall a meal, research the number of miles the food has traveled from farm to plate, and present the results. There is some discrepancy as to whether the instruction "research" includes calculating a total, and whether "present" means speaking to a partner, to the teacher, or to the whole class. In high schools where English lessons are often team-taught by Assistant Language Teachers (ALTs) and Japanese teachers, this may lead to conflicting approaches. Moreover, it can also be expected that vague instructions may cause confusion for students.

Based on the above results, it would be beneficial for teachers and curriculum developers to make lesson plans and teaching materials. One of the critical issues is that the level of difficulty should increase as the textbook progresses in order to optimally develop students' English skills. Although repeating and reviewing the same level is sometimes important for learning, it may hinder students' progress towards a more advanced level of language proficiency.

6. Conclusion

One of the primary goals of the present study was to look at textbook content in terms of vocabulary level, readability, and cognitive demand of output activities. The findings show the vocabulary level and readability scores are level-appropriate. Textbooks with more vocabulary and smaller print may look intuitively more difficult to teachers at first glance. However, the results show it is not always true. Teachers should not rely on their intuition and need to consider which textbook is most appropriate for students. It might be helpful if textbooks provide information of vocabulary profile and readability.

As for output, the communicative activities in textbooks are not engaging enough to deepen students' comprehension. The results indicated most activities focus on lower-order thinking skills. Since the students are high school students, they should be further challenged with more cognitively demanding activities, utilizing input provided in the texts. Furthermore, each textbook tends to repeat the same types of output activities. For instance, when a textbook adopts a format of output activity such as presentation and discussion, the textbook tended to use the same format at the end of each unit. This means students are presented with the same level of cognitive demand when completing the activities. It would be more engaging for students to experience a wider variety of activities.

Finally, the instructions for many activities are not explicit about what level of achievement is required. This means that the effectiveness of the activities in engaging students depends to a significant degree on a teacher's skill in adopting the activities. It would be more effective if each activity provided clear instructions, with more challenging options available for use with higher level students. Further research in this area should include methods to gauge students' perspectives, often overlooked in the design and evaluation of Japanese high school textbook activities.

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