



Analyzing and Modifying Reading Activities for Japanese EFL Students with Dyslexic Tendencies

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Abstract

For many students with dyslexia, completing reading activities can be a frustrating endeavor, leading to a decrease in motivation and poor assessment scores. In Japan, the English as a foreign language (EFL) classroom may have students with dyslexia or who exhibit dyslexic tendencies (DT). Though awareness is growing, official recognition and support for students with dyslexia and DT remains limited. As inclusive education continues to grow in popularity in Japan, accommodating students with learning disabilities such as dyslexia will be a necessary part of curriculum development.

In this paper, I discuss ways that EFL teachers can analyze and modify reading activities to support students with DT. I analyzed reading passages from popular EFL textbooks using Text Inspector software to determine whether modifications to the reading materials were necessary to accommodate students with DT. The results of the Text Inspector analysis showed that some reading activities in popular textbooks were more difficult than publishers advertise. I also give examples of effective ways in which reading materials can be modified to support students with DT and improve outcomes in the EFL classroom. Modifications based on previously published guidelines to reading materials include word choice, formatting changes, and presenting materials with visual aids.

Keywords: dyslexia, EFL, reading, Text Inspector, accommodation

Introduction

Despite a large body of research on dyslexia, and general agreement among language experts that dyslexia is a common and sometimes debilitating learning disability across all languages, there is not a universally accepted definition (Phillips & Kelly, 2022). Dyslexia is most commonly found in orthographically deep and opaque languages, such as English

(Kormos, 2017). For the purposes of this paper, I will refer to the definition adopted by the American Psychiatric Association and the International Dyslexic Association:

Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/ or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit on the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience [emphasis added]...(Lyon et al., 2003)

When describing dyslexia, (and learning disabilities in general), it is important to remember that all the symptoms and deficits manifest on a continuum, and some do not manifest at all. Dyslexia ranges from mild to severe, and everywhere in between. In this paper I will focus on reading behaviors. However, dyslexia can also manifest in altered writing behavior and general classroom behavior (Kormos, 2017; Mortimore, 2008).

The following behaviors are possible indicators of dyslexia. According to Kelly & Mortimore (2008), Phillips (2022), and Pokrivčáková et al. (2015) a student may be on the dyslexic spectrum if they exhibit some or all of the following behaviors (compared to the class average or expected level):

- Hesitant and labored reading, especially out loud
- Frequently loses place when reading
- Confusing letters such as b-d, m-n, p-d, u-n and those that sound similar
- Reading with a low level of comprehension
- Failure to recognize familiar words
- Omitting or inserting extra words

For the purpose of this paper, dyslexic tendencies (DT) are defined as some or all of the above behaviors as exhibited by students in the EFL classroom whether they have been officially diagnosed with dyslexia or other specific learning disorders or not. In addition, some authors cited here use learning disability, others use learning disorder, while still others use specific learning disorder. In this paper, they will be used interchangeably.

Dyslexia in L1 vs L2

Above, I listed some behaviors which may indicate that a student has DT. After

reading this list, EFL teachers in Japan may have the misconception that since many EFL students exhibit these behaviors, dyslexia must be very prevalent. While the rates of dyslexia are most likely underreported in Japan, it is important not to confuse early language acquisition stages as characteristics of dyslexia. A clarification between dyslexia in L1 and L2 is necessary.

The Special Education Needs and Disability (SEND) Code of Practice developed by the United Kingdom's Department for Education specifies that a lack of competence in English must not be equated with a learning disability (DfE, 2015). An EFL learner with dyslexia will perform better in other subjects compared to English. In addition, EFL learners with dyslexia usually do better with listening and speaking tasks compared with reading and writing. It is important that teachers who suspect a student as having DT to look at their performance in other areas of English learning, as well as their performance in other academic subjects. If there is a phonological deficit despite adequate exposure to English, reading achievement is significantly poorer than their fluency in spoken English and compared to their peers with similar English exposure, then the reading difficulty may be due to dyslexia rather than EFL factors (Nijakowska, 2010; Phillips & Kelly, 2022).

Support for dyslexia in higher education in Japan

While recognition and support for students with learning disorders (LD) in Japan has been increasing in recent years, approximately 10% of higher education students in Japan have an undiagnosed LD (Singleton & National Working Party on Dyslexia in Higher Education, 1998; Tanahashi, 2011). The most common LD in the L2 classroom is dyslexia, with an estimated 80% of students with a LD having some form of dyslexia (Moritoki Škof, 2015; Tanahashi, 2011; Wagner et al., 2020).

Dyslexic students in Japan may have learned to compensate in their L1. However, when it comes to learning a new sound-symbol system of a foreign language, especially English, the difficulties with phonological and orthographic processing appear again (Nijakowska, 2010). For Japanese students learning English, a compounding factor is the difficulty of the language. English is classified as an orthographically deep language, meaning there are many-to-many sound-letter correspondences. English is also an opaque language because it has silent letters (Kormos, 2017; Nijakowska, 2010).

The Japanese writing system students learn in early education (hiragana and

katakana) is orthographically shallow and transparent, which may give students with dyslexia time to form compensation skills to mitigate the effects of their learning disability when they eventually learn more orthographically opaque logographic kanji characters (Tanahashi, 2011). When Japanese students start learning English more intensely, the compensation skills students with dyslexia acquired in Japanese may not be applicable, since the phonology and orthography are different (Nijakowska, 2010).

A survey of higher education institutions by Japan Student Services Organization (JASSO) conducted in 2019 found that out of over 3.2 million students enrolled in higher education institutions, 6,047 students had been diagnosed with a developmental disorder, and 4,325 of these were given official support by their institutions. There were 213 students diagnosed with a specific learning disorder (SLD), which includes dyslexia and other learning disorders. Out of those 213 students, 134 were given official support by their institutions. The researchers made a special note about developmental disorders, commenting that in the course of their research, institutions reported 3,105 students with an undiagnosed developmental disorder for which students received official support (JASSO, 2021). Institutions did not report undiagnosed SLD numbers specifically. However, since dyslexia is the most common SLD, it can be assumed that the majority of the 3,105 students who are undiagnosed but who receive support have dyslexia.

There is a large gap between the number of students in higher education with diagnosed and undiagnosed LDs, and the number who are receiving official support. There are most likely many more students with dyslexia that remain unidentified and unsupported (Tanahashi, 2011). In previous papers, I described how foreign language teachers can support students with DT by adapting class materials and assessments (Montgomery, 2023; Montgomery, 2024).

Methods

In order to effectively modify reading activities for students with DT, the activities must first be analyzed. A general difficulty rating should be determined, then specific problematic vocabulary and phrases should be identified. Finally, actions can be taken to support students with DT when completing reading activities. For a general difficulty rating of the reading activities and measuring difficulty at the word level, I chose to use the Common European Framework of Reference for Languages (CEFR) for the rating system.

CEFR “...was designed to provide a transparent, coherent and comprehensive basis for the elaboration of language syllabuses and curriculum guidelines, the design of teaching and learning materials, and the assessment of foreign language proficiency” (Council of Europe, 2020). It is one of the most widely used EFL guides and provides an easily understood level system when assessing learning materials. For more details about how CEFR was developed and descriptors of CEFR levels, please visit the Council of Europe website (www.coe.int). Along with CEFR, I also used Flesch-Kincaid readability tests. These tests are used in a wide variety of disciplines and indicate how difficult a written passage is to understand. I used both Flesch-Kincaid readability tests in my analysis: the Flesch Reading Ease (FRE), and the Flesch-Kincaid Grade Level (FKL). They both use the same core measures, but they correlate inversely: A higher score on the FRE should have a lower score on the FKL. The higher the FRE (and lower the FKL), the easier the passage is to read (University of Canterbury, 2016). FKL emphasizes sentence length over word length, while the converse is true for FRE. For descriptions of the readability test equivalents, please see figure 1.

FRE score	FKL score	School level (US)	Notes
100.00-90.00	5	5th grade	Very easy to read. Easily understood by an average 11-year-old student.
90.0-80.0	6	6th grade	Easy to read. Conversational English for consumers.
80.0-70.0	7	7th grade	Fairly easy to read.
70.0-60.0	8, 9	8th & 9th grade	Plain English. Easily understood by 13- to 15-year-old students.
60.0-50.0	10-12	10th to 12th grade	Fairly difficult to read.
50.0-30.0	12-15	College	Difficult to read.
30.0-10.0	15-18	College graduate	Very difficult to read. Best understood by university graduates.
10.0-0.0	18+	Professional	Extremely difficult to read. Best understood by university graduates.

Figure 1. Flesch Reading Ease score and Flesch-Kincaid Grade Level score school level equivalents and notes (adapted from Linney, 2019; University of Canterbury 2016)

I chose two reading passages each from five top-selling EFL textbooks in Japan printed by three major publishers (labeled T1-T5). The books were chosen for their emphasis on reading tasks, advertised CEFR aim, and popularity. The two passages from each textbook (labeled A and B) were from the first half of the textbook and the last half of the textbook respectively. The CEFR aim, as specified by the publishers was between A1+

and B1. I tried to find textbooks that were as closely matched as possible in terms of CEFR aim. I chose A1+ to B1 because reading passages must be a certain minimum length to reliably give an overall CEFR score. A1+ textbooks were the lowest CEFR level that had long enough reading passages to analyze. Reading passages in pre-A1 and A1 level textbooks are often too short to analyze. In addition, many EFL students with DT will benefit from interventions early in their English studies, when they are still in A1 to B1 levels.

Text Inspector

Text Inspector (TI) is an online tool used to analyze reading passages and determine reading difficulty. I used the TI at www.textinspector.com, which, according to the website, “...is the most widely used text analyzer for preparing teaching materials, tests and evaluating students work” (Bax, 2022). I hoped that using TI software to analyze reading passages in popular EFL textbooks would give me a clearer picture of whether the reading passages were the appropriate level for students and aligned with the stated CEFR level advertised on the textbooks. The TI CEFR score analyzes the passage on the individual-word level, categorizing each unique word (labeled type in the results) into a CEFR



Figure 2. Screenshots of the Text Inspector output of textbook 1, reading A (T1A)

category A1 to C2 with an additional group labeled unlisted. Unlisted words are often pronouns or rarely used words.

In addition to a CEFR score, the TI analysis also provides Flesch-Kincaid readability test results. These tests assess readability of texts and give an approximate overall reading difficulty score. When starting the analysis on the TI website, it is important to specify that the passage is “reading”, not writing or listening. Also, it is also helpful to select “exclude all digits” to reduce unlisted results. Please see figure 2 for an example TI output.

Results

The results of the TI analysis are in table 1. Sample refers to the reading activity analyzed. The samples are labeled T1A through T5B. T# refers to the textbook number, and A/B at the end of the label refers to the first and second sample from each book, respectively. Word count is the total number of words in each sample. CEFR aim is the CEFR level of the textbook as given by the publisher. Vocab CEFR is the percentage of unique words (types) in each CEFR level, from A1 to C2 and unlisted vocabulary (unl.) as determined by the TI analysis. Vocab CEFR percentages may not equal exactly 100 because of rounding error. Overall CEFR is the score given to the entire text by the TI analysis. FRE/ FKL is the Flesch Reading Ease score and Flesch-Kincaid Grade Level given by the TI analysis.

Table 1. Results of the Text Inspector analysis

Sample	Word count	Vocab CEFR (% of types per CEFR level)							Overall CEFR	FRE/FKL
		CEFR aim	A1	A2	B1	B2	C1/C2	Unl.		
T1A	267	A1+ / A2	45%	25%	12%	4%	1%	14%	A2+*	82/5
T1B	364	A1+ / A2	65%	20%	9%	2%	0%	5%	A2	80/5
T2A	304	A2/B1	60%	16%	12%	6%	0%	5%	B1	65/7
T2B	242	A2/B1	50%	14%	16%	5%	0%	16%	B1	52/9
T3A	269	A2/ A2+	62%	16%	9%	4%	0%	9%	A2+	73/6
T3B	295	A2/ A2+	50%	25%	9%	3%	2%	12%	A2+	70/6
T4A	365	A2+ /B1	45%	21%	20%	7%	2%	6%	B2*	62/10
T4B	345	A2+ /B1	40%	16%	22%	12%	7%	4%	C2*	48/12
T5A	452	A2/B1	72%	13%	9%	3%	0%	4%	B1	76/6
T5B	479	A2/B1	57%	15%	11%	5%	1%	11%	A2+	71/7

*=Overall CEFR score was above the published CEFR aim.

In general, the TI analysis showed that reading passages equate to the advertised CEFR aim in each textbook. However, the majority of the passages scored on the higher end of the textbook CEFR aim, and three out of 10 scored above the aim. Only one (T5B) scored in the middle range of the published rating. None scored at the lower end of the aim or below. This suggests that many reading passages may be more challenging than teachers and students would expect by the advertised CEFR aim on the textbook. Reading passage length did not seem to impact the CEFR score or FRE/ FKL. The longest passage, T5B, had an overall CEFR rating of A2+. The shortest, T2B, had a CEFR rating of B1. FRE/ FKL scores followed the Overall CEFR ratings, with a few exceptions. T5A had an overall CEFR score of B1, but a higher FRE score than T5B, T3B, and T3A, which were all rated as A2+. However, the FKL scores were similar.

The following are where the TI analysis showed higher CEFR scores than the published CEFR aims. T1A was rated with an overall CEFR score of A2+, but the published CEFR aim was between A1+ and A2. T4A was rated as B2 but the published aims were A2+ to B1. T4B was rated as C2, though the published aims were A2+ to B1. T4B's significantly higher rating was partially due to 7% of the vocabulary rated as C1 or C2, but the FRE/ FKL score also reflected the difficulty rating, since it scored 48/ 12, much more difficult than any of the other readings I analyzed, suggesting difficulty not just in the vocabulary but also at the sentence level. How teachers can support students with DT when doing more challenging reading tasks will be discussed in the next section.

Looking at the overall CEFR score from the TI does not always give us a full picture. In the cases where the overall CEFR ratings were equal, the FRE/ FKL scores showed some differences. T2A, T2B, and T5A had an overall CEFR rating of B1. However, the FRE/ FKL for T2A was 65/ 7, while T2B was 52/ 9, and T5A was 76/ 6. This suggests that T2B will be more difficult than T2A and T5A. T1A, T3B and T5B had an overall CEFR score of A2+, but the FRE/ FKL scores for T1A was 82/ 5, T3B was 70/ 6, and T5B was 71/ 7. This suggests that T3B and T5B will be more difficult than T1A.

Discussion

We can see from the results of the TI analysis that while many of the analyzed texts fell into the range of published CEFR aims (though usually at the higher end), three out of 10 were rated above, and one was rated two full levels higher. In this section, I would like

to discuss some strategies teachers can use to support students with DT when doing reading activities.

First, using the TI software, teachers can quickly identify vocabulary that students might find difficult in the reading passage by looking at the vocabulary listed by CEFR level. Figure 3 shows an example vocabulary list output organized by CEFR level, from sample T4B. This vocabulary may be those listed at a higher CEFR level than the reading aim or identified by the teacher as most likely being an unknown word, such as those in the unlisted group.

C1 11 types / 11 tokens 5.95% / 3.23% (Hide words)	C2 1 types / 2 tokens 0.54% / 0.59% (Hide words)	Unlisted 8 types / 10 tokens 4.32% / 2.93% (Hide words)
consumption (1) continually (1) customary (1) evaluate (1) impose (1) know what (1) obese (1) obesity (1) radically (1) restrictions (1) somewhat (1)	ethical (2)	's (3) (Amend) ailments (1) (Amend) arthritis (1) (Amend) carbohydrates (1) (Amend) diabetes (1) (Amend) greenhouse (1) (Amend) livestock (1) (Amend) nutrients (1) (Amend)

Figure 3. Example of Text Inspector vocabulary lists output by CEFR level

After the challenging vocabulary is identified by the TI analysis, according to Nijakowska (2010) and Phillips & Kelly (2022), the following supplementary material and support can be beneficial. Educators can create a word bank with translated definitions in the students L1 and pre- teach the vocabulary before the reading task is assigned. Support in students L1 has been found to be an effective way to maintain motivation and avoid frustration. Discussing key vocabulary and asking questions about the students experiences with the topic can also help students with DT. Many students with DT find visual cues helpful: educators can further support background knowledge by adding relevant pictures.

In addition to the ideas mentioned above, educators can rewrite the reading passage (following copyright laws when applicable) in order to improve the FRE/ FKL score or lower the CEFR level, or both. They can monitor the rewriting progress by occasionally reanalyzing the reading activity throughout the editing process with the TI software. This does two things. First, it helps the educator efficiently edit the reading by signifying when they can stop the rewriting process, by showing when the edited version gets to the target CEFR level and FRE/ FKL score. Second, it gives the educator confidence that their edited version is not overly simplified, or that they have not introduced additional difficult language or complicated phrases that would negate the aim of the editing.

When rewriting reading passages, there are formatting changes that can improve readability. Students with DT may benefit from having texts enlarged and double-spaced to avoid one line merging with another, and using alternative color schemes to reduce eye strain when reading black-on-white text (Phillips & Kelly, 2022). Students with DT may have a more difficult time reading serif and italic fonts. Alternatives such as verdana, arial, and calibri fonts have been found to improve readability (Daloiso, 2017; Nijakowska, 2010). For a description of an action research project that modified existing materials to support students with DT, please see Montgomery (2024).

Conclusion

EFL students with dyslexic tendencies often require additional consideration and accommodation concerning reading activities. As inclusive education continues to grow in popularity in Japan, the need to accommodate students with learning disabilities such as dyslexia will increase in the future. Knowing the difficulty of the reading activity through software analysis, then modifying the reading and providing additional support based on professionally recommended protocols is an efficient way educators can support these students.

Using TI software to analyze reading activities can give educators a more detailed view of the difficulty of the activities as a whole, as well as at the individual word level. This software gives an overall CEFR rating to the reading activity, Flesch-Kincaid readability test scores, and a breakdown of vocabulary by CEFR level. These three results can be used to prepare additional materials to support students with dyslexic tendencies.

The results from my text inspector analysis of 10 reading samples from five popular

textbooks showed that reading activities were generally rated at the higher end of the published CEFR aims, and three were rated higher than the published aims. Flesch-Kincaid readability scores supported these results. When choosing a textbook, educators should be aware that reading activities may be more difficult than the advertised CEFR aims would suggest. Taking these results into consideration, I gave suggestions on how to modify the reading activities by rewriting the activities with the help of software analysis, and additional formatting ideas, such as using clearer spacing, sizing, fonts, and colors. These ideas, coupled with targeted pre-teaching of new vocabulary, will provide support for students with DT and hopefully improve motivation and assessment outcomes.

In the future, I would like to expand my reading activity analysis by incorporating more samples, as well as different CEFR levels above B1. I would also like to begin an action research project that incorporates the reading modifications outlined here to modify reading activities in an existing EFL course.

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