



# Readability Analysis of Text in English Textbooks of Federal Board of Intermediate and Secondary Education for Higher Secondary Level

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## Abstract

This study mainly focuses on the readability of the text of the HSSC-II textbook. Considering the importance of textbook evaluation, the study evaluated the English textbook of HSSC-II, which is taught at all the colleges affiliated with the Federal Board of Intermediate and Secondary Education (FBISE). Selected texts from the book have been analyzed so as to determine their readability. The texts were analyzed through an online text evaluation tool, the Text Readability Consensus Calculator (TRCC), which determines the grade level, text readability level, and age of the reader as well as the appropriation of the text. The readability scores of the text yielded by the TRCC were compared with the students' results of the comprehension test. This comparison reveals that the original text is "fairly difficult to read" for 13–15-year-old native readers among 8th and 9th grade students, while the evaluator rates the simplified text as "fairly easy to read" for native readers among 12–14-year-old 7th and 8th grade students. While the comprehension test results for non-native readers show that the text is extremely difficult, non-native 12th graders with an average age of 17 could only get 39% in the original text and 47.6% in the simplified text. The research concludes with some suggestions for the text designer to consider various features for making text readability compatible with the grade level of the students.

**Keywords:** readability, comparison, text readability, consensus, calculator

## 1. Introduction

Text readability is a crucial aspect of any text. It plays a pivotal role in reading comprehension. Davids (2002) describes the readability of a text on the basis of how easy or difficult it is for a certain reader. Reading is considered a receptive skill, and it is formally taught at schools and colleges. Text readability is unavoidable when it comes to teaching reading. Rohani (2002) affirms that the central idea of a text may be easily understood through good reading skills. So the readability of a text must not be ignored when it comes to selecting a text for students. Miftahurrahmi et al. (2017) attribute the readability of a text to the compatibility between the reader and the text. All these definitions imply that readability helps a text convey clear meaning and determines whether the text is appropriate for the intended audience. An appropriate level of readability develops a deep connection between text and reader. Consideration of students' grade level, age group, and context are the criteria for a text to be good and suitable for the intended reader. Non-native readers generally seem to find the text, which is written for native readers, very difficult. According to Davies (1995), who determines text difficulties using various readability formulas, Prins and Ulijin (1998) consider the successful communication of the writer's intention as the readability of a text. Readability software tools analyse various factors, like presentation, content, and language mechanics, accurately. Taking the role of readability into consideration, this study analyses the text so as to determine its readability considering the grade level of the text, the reading level of the text, the reader's age, and the reader's grade level. For example, a text with a certain grade level may have a reading level, e.g., "easy to read" or "difficult to read," for learners of a certain age group and grade level.

### 1.1 Background of the Study

A textbook is an effective tool for guiding students through the dynamic learning and teaching process (Arfan et al., 2019). One cannot even think of an effective teaching and learning process without textbooks. They are a source for providing students with knowledge in a well-organized way. Textbooks assist teachers in meeting objectives by providing a well-planned knowledge structure. Mehmood (2011) affirms, citing Chambliss and Calfee, that all educational activities revolve around textbooks. They provide students with new facts and open new doors to the real world. According to Rehmawati (2018), teachers and students should have easy access to textbooks. They make the concepts of subject matter clear to students and teachers. Keeping the pivotal role played by textbooks in an effective teaching and learning process in view, the readability of a text can never be ignored. Readability is an important feature of a text that affects the difficulty level of a text, which ultimately affects the students' performance in reading comprehension. Putra (2019) conforms to the idea that a text can be well understood only if it has an appropriate readability level, which may attract students' attention towards reading.

### 1.2 Purpose Statement

The study aims at evaluating the English textbook for HSSC-II in order to determine the readability level of the selected texts. An online tool called the "Text Readability Consensus Calculator" has been used to evaluate the selected texts from the book so as to determine the text's readability.



### 1.3 Research Objectives

- To evaluate the HSSC-II English text book so as to analyse the level of readability of the text
- To take a reading comprehension test and compare the readability scores with the comprehension test results in order to determine whether the score of the text analysis matches the students' actual performance
- To determine the appropriateness of the text for a particular reader

### 1.4 Research question

- What is the level of text readability of the textbook for HSSC-II?
- Is the readability level of the text appropriate for the target reader?

### 1.5 Readability

In terms of understanding the meaning of a written text, readability plays an important role. Readability is considered a receptive skill. A text with an appropriate readability level may help a reader improve their reading skills. Youn (2014) opines that the readability of text depends on several factors like content, style, layout, structure, and design. According to Zamanian and Heydari (2012), readability includes all the elements within a piece of writing that affect the reader's success, that is, how the readers read the text at optimal speed, understand it, and take an interest in it.

Hundreds of formulas have been proposed to determine the readability of a text. In this study, an online readability checker, TRCC, has been used to determine the text's readability by taking a sample of the text. It calculates the number of sentences, words, and even characters in the sample text on the basis of seven different formulas, and it determines the reading level, grade level, and readability level of the targeted text.

### 1.6 Significance of the Study

The research will be a valuable addition to the existing work on readability because it reinforces the concept of readability by evaluating texts from textbooks. It will be a useful guideline for curriculum developers, syllabus designers, and textbook writers because it provides useful details about text readability. The study will make the teachers aware of the effects of the readability of a text on students' success in reading comprehension so that they will consider the readability of texts carefully before going to the classroom.

## 2. Literature Review

### 2.1 Readability and Lexical Density

The readability of a text plays a pivotal role in reading comprehension. It may make a text easy or difficult to understand. Fulcher (1997) describes readability as a right balance between the features that may affect the reading capability of readers. Davis (2002) defines readability as the ease or difficulty of a text for readers at a specific grade level.

Walter (1979) recommends that careful attention be paid to the readability of a text as it is one of its crucial factors. Nurhamish (2017) reports the five influential factors proposed by R. Day as background knowledge, lexical knowledge, discourse phenomena, organization, and length of a text. In language acquisition, developing reading skills should not be ignored, even though it may be a time-consuming job to find appropriate material. In this regard, readability is the only total of all materials that can influence reading comprehension, fluency, and reader interest (Xia, Kochmar, & Briscoe, 2016). Handayani (2014) testifies to the notion of readability and the level of difficulty it takes into account.

According to Gillan and Newbold (2010), readability formulas have been worked on since 1915 and 1920 in order to examine the reading comprehension of individuals, particularly in terms of standardised reading tests. These formulas are based on mathematical indices that are based on the analysis of language variables. Statistical measures like lexical density, diversity, and lexical richness help in assessing students' progress. When a text contains a variety of words, it is said to be a lexically rich text; on the other hand, lexical diversity is the proportion of lexical items in a text (Gregori & Clavel, 2015).

A text with appropriate lexical density is easy to understand. As compared to spoken texts, written texts are said to have a higher lexical density. Johanson (2008) describes a text as having high lexical diversity if it contains a variety of words, but if it contains more functional words than lexical words, it has low lexical density. Lexical density plays a crucial role in the analysis of a text. It is used to analyse texts in terms of the number of content words (Hidayat, 2015, 2016). In a clause, lexical density is calculated according to the ratio of lexical items to functional words (Nuran, 1993).

Thomas and Fan (2013) evaluated four textbooks using Ure, Flesch, and Halliday's formulas and claimed that three out of four texts had high lexical density and readability that met an appropriate level. Their study did not pay much attention to the compatibility of readability levels with non-native readers' performances.

Sari (2016) used Cattelo's method to measure the lexical density and readability of texts and opines that higher levels of texts do not necessarily have higher lexical density. Handayani (2014) evaluated science students' books in order to determine the readability level of the text. They compared cloze test results and scores yielded by the Flesch Reading Ease formula and claimed that the text has a relatively low readability level.

Textbooks are a commonly used source in the classroom. The readability level is generally considered to be higher than the intended grade level. Hidayat, (2016), also used Flesch's reading formula to determine readability level and found the texts to be of standard level; they were said to be suitable for the students of the intended grade level. Rohmatillah's (2018) evaluation of a textbook for grade X shows that the textbooks contain various kinds of texts like narrative texts, news items, descriptive texts, and recounts. The calculation of the readability level of a text, shows that out of sixteen texts, five are appropriate for the students. Maryansyah (2016) used the Fry readability formula and found that 54% of texts were easy to read, 27% were difficult to read, and 10% were invalid. They concluded that 9% of the texts were appropriate for IX-grade students.

Unlike the previous research I reviewed, the current study evaluated textbooks of the higher secondary level to determine the readability level of the texts, which will be a valuable addition to the field's existing work. Flesch's Reading Ease formula has been used in most of the reviewed literature, whereas the current study used an online readability checker, the Text Readability Consensus Calculator (TRCC), in order to determine the readability level of the selected text.

### 3. Methodology

#### 3.1 Research Design

Mixed methods of research are generally considered to carry out qualitative and quantitative analyses simultaneously or sequentially. Donrye (2007) suggests using quantitative and qualitative data separately and mixing the data at the last stage. Dornye (2007), citing different researchers (such as Caracelli and Greene, 1993; Onwuegbuzie and Teddlie, 2003), stated that data may be integrated at the stage of analysis. More effective techniques for using qualitative and quantitative data can also be used. Data transformation is one of these analytical strategies. The current study used a data transformation and analysis strategy. Using this strategy, qualitative data is transformed into quantitative data, and the data is integrated during analysis. For the first time, Miles and Huberman (1994), Tashakkori and Teddlie (1998) introduced data transformation strategy.

#### 3.2 Data Analysis

A text may be easy or difficult to understand on the basis of its readability (Richard & Schmidt, 2002:442). That is, if the readability of a text meets the level of the learner, it can be easy to understand. Dubay (2004) opines that a text with a suitable level of readability becomes easier to understand than other texts. It entails that readability means there is a match between the selected text and the reader. Good readers as well as poor readers may not take an interest in a text that lacks an appropriate level of readability.

The current study used TRCC to determine the readability of the selected texts. TRCC determines a text's readability level based on its grade level and the reader's age. It calculates the number of sentences, words, syllables, and characters in the sample text using seven different readability formulas. The study compared the reading comprehension results with the readability level of the text as determined by TRCC. The comparison was made so as to see whether the readability level of the text matches the grade level and age of the non-native readers.

Table 1: Comparison of Readability Results across Non-Native Readers

Texts	Grade Level of Text		Reading Level of Text		Reader's Age		Reader's Grade	
	Original	Simplified	Original	Simplified	Original	Simplified	Original	Simplified
T.1	8	6	fairly easy to read	fairly easy to read	12-14 years old	10-11 years old	Seventh and Eighth graders	Fifth and Sixth graders
T.2	13	9	fairly difficult to read	fairly difficult to read	18-19 years old	13-15 years old	(College level entry)	Eighth and Ninth graders
T.3	9	8	standard / average	fairly easy to read	13-15 years old	12-14 years old	Eighth and Ninth graders	Seventh and Eighth graders
T.4	12	8	fairly difficult to read	standard / average	17-18 years old	12-14 years old	Twelfth graders	Seventh and Eighth graders
T.5	6	7	fairly easy to read	fairly easy to read	10-11 years old	11-13 years old	Fifth and Sixth graders	Sixth and Seventh graders
T.6	5	5	easy to read	easy to read	8-9 years old	8-9 years old	Fourth and Fifth graders	Fourth and Fifth graders
T.7	10	7	standard / average	fairly easy to read	14-15 years old	11-13 years old	Ninth to Tenth graders	Sixth and Seventh graders
T.8	8	6	fairly easy to read	easy to read	12-14 years old	10-11 years old	Seventh and Eighth graders	Fifth and Sixth graders
T.9	10	9	fairly difficult to read	fairly difficult to read	14-15 years old	13-15 years old	Ninth to Tenth graders	Eighth and Ninth graders
T.10	9	8	fairly difficult to read	fairly difficult to read	13-15 years old	12-14 years old	Eighth and Ninth graders	Seventh and Eighth graders
T.11	15	10	difficult to read	fairly difficult to read	Not shown	14-15 years old	College graduate	Ninth to Tenth graders
T.12	9	8	standard / average	standard / average	13-15 years old	12-14 years old	Eighth and Ninth graders	Seventh and Eighth graders
T.13	14	7	fairly difficult to read	fairly easy to read	21-22 years old	11-13 years old	college level	Sixth and Seventh graders
T.14	23	8	very difficult to read	fairly easy to read	21-22 years old	12-14 years old	College graduate	Seventh and Eighth grade

### 4. Findings and Conclusion

#### 4.1 Findings of Readability

If the grade level of a text is 10, TRCC determines it to be "fairly difficult to read" for ninth and tenth graders who are 14–15 years old. The original texts from the textbook for HSSC-II have an average grade level of 10.3. The frequency of the text reading level "fairly difficult to read" is 5, which is the highest frequency of all the original texts of the text, and the frequency of the reader's age "13–15 years old" is 3, which is also the highest frequency of the age group. The highest frequency of the reader's grade level is "8th–9th," which is again 3. The analysis reveals that the text is generally difficult to read for 8th and 9th graders, aged 13 to 15.

The readers involved in the reading comprehension test are non-native. They received an average of 7.9 out of 20 in the original text reading comprehension test; the average percentage is 39.3%, and the students are on average 17.5 years old. From the results yielded by the Readability Consensus Calculator, it is found that a text that is fairly difficult for 8th-9th graders who are 13–15 years old and native readers is highly difficult for non-native 12th graders who are on average 17–18 years old, therefore their performance is not so good in the reading comprehension test.

The average grade level of the simplified text of the text is 7.5, and the text reading level "fairly easy to read" has the highest frequency at 6. The highest frequency of the reader's age is also 6, and it is "12–14 years old." The frequency of the reader's grade level (7th–8th) is 5, which is the highest frequency in the list. The readability consensus calculator determines a text with grade level 7 as "fairly easy to read" for 11–13-year-old native readers in sixth and seventh grade. The Readability Consensus Calculator results show that the simplified text is "fairly easy to read" for native 7th and 8th graders aged 12-14.

Students' average obtained marks in a reading comprehension test of simplified text are 9.5 out of 20, which becomes an average of 47.6%. It shows that a text that is "fairly easy to read" for 12 to 14-year-old native readers in 7th and 8th grade is difficult for non-native 12-year-olds who are on average 17.2 years old, and therefore they have hardly obtained passing marks.

Table 2: (Summary of readability of original text –A)

Summary of Readability of original text of Text-A							
Text	TGL	Text Reading Level	F	Reader's Age	F	Reader's Grade Level	F
Text-A/1	8	Easy to read	1	8&9 years old	1	4 <sup>th</sup> -5 <sup>th</sup>	1
Text-A/2	13	Fairly easy to read	3	10&11years old	1	5 <sup>th</sup> - 6 <sup>th</sup>	1
Text-A/3	9	Very easy to read	0	12&14 years old	2	6 <sup>th</sup> - 7 <sup>th</sup>	0
Text-A/4	12	Standard/ average	3	13&15 years old	3	7 <sup>th</sup> - 8 <sup>th</sup>	2
Text-A/5	6	Difficult to read	1	14&15 years old	2	8 <sup>th</sup> - 9 <sup>th</sup>	3
Text-A/6	5	Fairly difficult to read	5	17&18 years old	1	9 <sup>th</sup> – 10 <sup>th</sup>	2
Text-A/7	10	Very difficult to read	1	18&19 years old	1	10 <sup>th</sup> -11 <sup>th</sup>	0
Text-A/8	8			21&22 years old	2	11 <sup>th</sup> - 12 <sup>th</sup>	1
Text-A/9	10			not shown	1	college entry level	2
Text-A/10	9				14	college level	0
Text-A/11	15					college graduate	2
Text-A/12	9						
Text-A/13	14						
Text-A/14	23						
<b>Sum</b>	<b>113</b>						
<b>Average</b>	<b>10.3</b>						
Summary of Readability of simplified text of Text-A							
Text	TGL	Text Reading Level	F	Reader's Age	F	Reader's Grade Level	F
Text-A/1	6	Easy to read	2	8 &9 years old	1	4 <sup>th</sup> -5 <sup>th</sup>	1
Text-A/2	9	Fairly easy to read	6	10&11years old	2	5 <sup>th</sup> - 6 <sup>th</sup>	2
Text-A/3	8	Very easy to read	0	11&13 years old	3	6 <sup>th</sup> - 7 <sup>th</sup>	3
Text-A/4	8	Standard/ average	2	12&14 years old	5	7 <sup>th</sup> - 8 <sup>th</sup>	5
Text-A/5	7	Difficult to read	0	13&15 years old	2	8 <sup>th</sup> - 9 <sup>th</sup>	2
Text-A/6	5	Fairly difficult to rad	0	14&15 years old	1	9 <sup>th</sup> – 10 <sup>th</sup>	1
Text-A/7	7	Very difficult to read	4			10 <sup>th</sup> -11 <sup>th</sup>	0
Text-A/8	6					11 <sup>th</sup> - 12 <sup>th</sup>	0
Text-A/9	9					college entry level	0
Text-A/10	8					college level	0
Text-A/11	10					college graduate	0
Text-A/12	8						
Text-A/13	7						
Text-A/14	8						
<b>Sum</b>	<b>98</b>						
<b>Average</b>	<b>7.5</b>						

Table 3: (Summary of the results of students in Text- A)

Summary of Result of students in Text-A									
Original text					Simplified Text				
Student	Age	T. M.	Obt.M.	%age	Student	Age	T. M.	Obt. M.	%age
Student 1	18	20	6	30	Student 1	18	20	9	45
Student 2	18	20	11	55	Student 2	18	20	10	50
Student 3	19	20	13	65	Student 3	18	20	10	50
Student 4	13	20	7	35	Student 4	17	20	10	50
Student 5	17	20	10	50	Student 5	17	20	13	65
Student 6	17	20	10	50	Student 6	17	20	9	45
Student 7	16	20	9	45	Student 7	18	20	9	45
Student 8	15	20	10	50	Student 8	17	20	9	45
Student 9	17	20	15	75	Student 9	17	20	11	55
Student 10	18	20	14	70	Student 10	17	20	10	50
Student 11	19	20	10	50	Student 11	18	20	15	75
Student 12	19	20	10	50	Student 12	18	20	15	75
Student 13	18	20	10	50	Student 13	17	20	13	65
Student 14	17	20	14	70	Student 14	17	20	12	60
Student 15	17	20	10	50	Student 15	18	20	10	50
Student 16	18	20	1	5	Student 16	14	20	2	10
Student 17	16	20	1	5	Student 17	18	20	4	20
Student 18	19	20	5	25	Student 18	18	20	5	25
Student 19	17	20	4	20	Student 19	15	20	6	30
Student 20	17	20	5	25	Student 20	16	20	8	40
Student 21	17	20	4	20	Student 21	18	20	5	25
Student 22	18	20	3	15	Student 22	15	20	4	20
Student 23	18	20	10	50	Student 23	17	20	15	75
Student 24	19	20	7	35	Student 24	16	20	11	55
Student 25	18	20	3	15	Student 25	17	20	16	80
Student 26	19	20	6	30	Student 26	18	20	7	35
Student 27	18	20	9	45	Student 27	17	20	12	60
Student 28	17	20	9	45	Student 28	17	20	6	30
Student 29	17	20	6	30	Student 29	16	20	6	30
Student 30	17	20	7	35	Student 30	17	20	11	55
Student 31	17	20	11	55	Student 31	16	20	11	55
Student 32	17	20	8	40	Student 32	17	20	11	55
Student 33	17	20	7	35	Student 33	17	20	14	70
Student 34	17	20	8	40	Student 34	18	20	4	20
Student 35	18	20	8	40	Student 35	19	20	13	65
Student 36	17	20	9	45	Student 36	17	20	7	35
Student 37	17	20	8	40	Student 37	17	20	12	60
Student 38	18	20	5	25	Student 38	18	20	14	70
Student 39	17	20	6	30	Student 39	19	20	11	55
Student 40	17	20	8	40	Student 40	17	20	10	50
Student 41	18	20	9	45	Student 41	17	20	10	50
Student 42	19	20	11	55	Student 42	19	20	5	25
Student 43	16	20	5	25	Student 43	16	20	12	60
Student 44	18	20	8	40	Student 44	17	20	12	60
Student 45	17	20	7	35	Student 45	18	20	10	50
Student 46	17	20	6	30	Student 46	17	20	9	45
Student 47	17	20	10	50	Student 47	20	20	8	40
Student 48	18	20	8	40	Student 48	16	20	13	65
Student 49	18	20	6	30	Student 49	16	20	9	45
Student 50	17	20	4	20	Student 50	18	20	5	25
Student 51	17	20	6	30	Student 51	17	20	7	35
Student 52	19	20	3	15	Student 52	17	20	8	40
Student 53	18	20	2	10	Student 53	18	20	7	35
Student 54	18	20	6	30	Student 54	18	20	5	25
Student 55	18	20	15	75	Student 55	16	20	10	50
Student 56	18	20	12	60	Student 56	17	20	16	80
Student 57	18	20	12	60	Student 57	16	20	15	75
Student 58	18	20	13	65	Student 58	18	20	15	75
Student 59	18	20	14	70	Student 59	17	20	10	50
Student 61	16	20	12	60	Student 61	15	20	5	25
Student 62	17	20	5	25	Student 62	17	20	7	35
Student 63	17	20	8	40	Student 63	20	20	8	40
Student 64	19	20	1	5	Student 64	18	20	6	30
Student 65	17	20	3	15	Student 65	18	20	7	35
<b>Average</b>	<b>17.5</b>		<b>7.9</b>	<b>39.3</b>	<b>Average</b>	<b>17.2</b>		<b>9.5</b>	<b>47.6</b>

5. Conclusions

According to the results of the readability analysis, the original text is "fairly difficult" for thirteen to fifteen (13-15) year old native readers in the eighth and ninth grades, whereas the simplified version of the text is "fairly easy" for seventh and eighth graders who are 12–14-year-old native readers. Reading comprehension test results show that this text is extremely difficult for non-native 17-year-old 12th graders, as evidenced by their scores of 39% in the original text and 47% in the simplified text.

Readability analysis of Text-B shows that both the original and simplified texts are easy to read for 8- to 9-year-old native readers in 4th and 5th grades. Students' results in both texts indicate that the text is difficult for average 16.6-year-old non-native readers in 11th grade. They obtained 47.8% of the original text and averaged 49.2% of Text-B's simplified text. Their result leads them to the conclusion that the texts are difficult for them to comprehend.

## 6. Recommendations

A textbook is as important as a teacher in the classroom. It plays a pivotal role in teaching and learning. A textbook should be examined from various perspectives in order to provide an appropriate text to the ultimate learners. Like all the other features of a textbook, the readability of a text is also a crucial aspect that should never be compromised. Taking the findings of the study into consideration, the following recommendations are put forward: Before presenting text to the final readers, all parties involved, such as curriculum developers and syllabus designers, must consider its readability. Textbook writers and teachers should not only be made aware of readability, but they must also be trained properly. To provide appropriate texts to the ultimate readers, textbooks must be analysed to determine their readability level. It may not only reduce the difficulty of text, but it may also enable the learners to grasp the meaning of text and develop an interest in reading.

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