Readability Analysis of Local Wisdom Non-Fiction Texts in Android-Based Interactive Multimedia for Elementary School Students With Fry Graph Formulas

Ravinda Mahendri*, Endang Sri Mujiwati, Kukuh Andri Aka
Elementary School Teacher Education Study Program, Universitas Nusantara PGRI Kediri
*Corresponding Author: ravindamahendri231327@gmail.com

Abstract: The purpose of this study was to analyze the legibility of non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia intended for 4th grade elementary school students with the readability formula of the Fry Graph. The method in this research is descriptive quantitative. The objects of this research are ten non-fiction texts containing local wisdom in Kediri Raya. The research instrument uses documentation with data collected in the form of non-fiction texts of local wisdom of Kediri Raya in Android-based interactive multimedia. Analysis of the data in this study using the Fry Graph formula as a guide for analyzing the level of readability in non-fiction texts. The results showed that the readability level of ten non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia had the feasibility and suitability of the readability level for 4th grade elementary school students, because the readability levels of these ten nonfiction texts were in areas 2, 3, 4 and 6 which means the non-fiction text of Kediri Raya's local wisdom in interactive multimedia based on Android is suitable and appropriate for grades 2, 3, 4 and 6 of elementary school.

Introduction

In its development, knowledge can be obtained in various ways such as doing positive activities, through experience, through observing a problem or situation, through the process of listening to get information and through the reading process. Knowledge can be obtained in various ways, one of which is by reading, reading is an activity to obtain information or messages from an article contained in reading (Fatin, 2017). According to (Khusnaini, 2020) reading can also be interpreted as a process carried out by someone to seek an understanding of the content of something that is read. Reading activities are very important to be instilled from an early age, instilling the importance of reading must also pay attention to reading materials that will later be read, for early childhood children, especially elementary school age, the reading material provided is of course not the same as reading material for teenagers or adults. Special attention is needed to choose reading materials that are intended for early childhood, especially elementary school age children, especially in terms of reading readability.

The reading material that will be given to children, the level of readability must be in accordance with the child's age. Parents or teachers must be selective and also careful in choosing reading materials. One thing that needs to be considered in providing reading material for children is the level of readability. Quality reading material is reading material that is suitable for increasing the age of the child, to find out whether the reading material is appropriate for the child's age, namely by calculating the level of reading readability.

Readability itself can be interpreted as a matter that discusses the difficulty and ease of text or reading material (Fadilah, 2015).

There are still many learning media that have not been able to improve children's literacy or learning media related to reading. Children will get bored quickly if they are given reading material that is only in the form of print media, especially if the reading material is not interesting with no pictures or other constituent elements that make it interesting (Ramdani, 2014). Most teachers in schools more often provide reading materials like that, so students do not feel interested in reading activities, not only teachers at school parents also often do not pay attention to the form of reading materials that are able to attract children's attention to reading, they still often give uninteresting and boring reading material for children.

There are several factors that are taken into consideration in calculating the readability of reading materials, especially Indonesian, the first is the level of word complexity and sentence length of a reading, the second is the difference between the background of the writer and the reader. This is in accordance with and is related to the opinion expressed by Sulastri in (Ibnu, 2016) which states that the suitability of the readability of a reading material is closely related and has an effect on sentence structure, number of words, and difficult words. To teach children how to get used to reading activities, several strategies are needed, one of which is to start introducing children to readings that they like and have an attraction for children. The reading materials can be in the form of children's stories such as fables, short stories, comics, fairy tales or legends, mythical stories, illustrated stories that children like, stories about local wisdom from various regions and so on. In this research research, the reading material that will be given to children is non-fiction text containing Kediri Raya local wisdom in Android-based interactive multimedia.

Non-fiction text is a scientific study or based on an experience in which there is an explanation of a story or experience based on reality in an area (Nurgianto, 2018) a characteristic of a particular area. These characteristics can be in the form of a hereditary culture (Fajarini, 2014). Non-fiction texts can also contain a series of presentations from a story or experience based on reality in an area, such as non-fiction texts that contain explanations of various local wisdoms that exist in a place such as Kediri Raya. In this non-fiction text that contains local wisdom in the Kediri Raya area, it will be packaged into an Android-based interactive multimedia. Interactive multimedia is media that contains a combination of text, video, images, sound, and animation to convey information that is used through electronic media such as computers or Android. There are so many interesting learning media models in the form of interactive multimedia. Interactive multimedia can be understood as a medium used to support the learning process for children more attractively because it uses a combination of several elements including video, animation, images, sound in its preparation (Surjono, 2017). In this modern era, many children understand and can even apply information technology such as cellphones. Therefore, researchers will take this opportunity to increase children's interest in reading by providing children with interesting reading materials packaged in Android-based interactive multimedia containing non-fiction texts containing local wisdom in Kediri Raya, especially for elementary school-aged children in grade 4. With interactive multimedia-based Android is expected that children are interested in reading, and feel fun with the quiz games contained in the interactive multimedia based on Android. In addition, pictures, animations and sound effects will make children more enthusiastic in learning and reading. Children will also get information related to local wisdom in various areas in Kediri Raya so that children will better understand how to appreciate and preserve local wisdom in their respective regions.

Quality reading material is reading material that has a readability level according to the age of the child. Lots of reading material whose level of readability is not in accordance with the child's age but is given to the child, so that the child has difficulty in understanding a reading and the knowledge that should be obtained by the child will be hampered. Tampubolon in (Anih, 2016), suggests that readability is also related to the suitability of a reading with the reader in terms of the level of difficulty. The way to find out the readability of a reading material is by using the Fry Graph readability formula. This formula works by paying attention to the short length of a sentence in the reading and based on the number of syllables to find out the difficulty of the vocabulary in the sentence. In the process of determining the level of readability, calculations using this formula take only 100 words from a reading material, the legibility of a reading can be known for example a graph showing area 4, then the reading is suitable for grade 4, 5, and 6 elementary school children. The purpose of this research is to determine the suitability of the readability of non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia aimed at 4th grade elementary school students using the theory of readability of the Fry Graph.

Previous research conducted by Yasa regarding the analysis of the level of readability of a discourse with the Graph Fry formula states that this formula can be used to determine the level of readability of Indonesian reading (Yasa, 2013). Research on the Fry Graph and analysis of the level of readability of reading using the Fry Graph formula is also strengthened by previous research by Nuryani, namely the analysis of the level of readability of reading material in UN questions. From the results of his research, it was stated that there were several questions whose readability levels were not in accordance with high school students (Nuryani, 2016). The purpose of this study was to analyze the legibility of non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia aimed at 4th grade elementary school students with the readability formula of the Fry Graph. This research was conducted so that readers know how to know the level of readability of a reading material that will be given to children. With this research, it is hoped that parents and teachers can be selective in choosing reading materials for children.

Research Method

In this research, the method used is descriptive quantitative. Quantitative research itself is also called research using numbers where the analysis uses statistics (Sugiyono, 2012). Or it can be interpreted as the process of collecting data, as well as interpreting and displaying data by using numbers that can be done through research or study (Suyoto, 2015). The data collected is in the form of non-fiction texts of local wisdom in Kediri Raya in Android-based interactive multimedia. The research instrument or data collection technique in this research is documentation. Analysis of the data in this study using the Fry Graph formula as a guide for analyzing the level of readability in non-fiction texts.
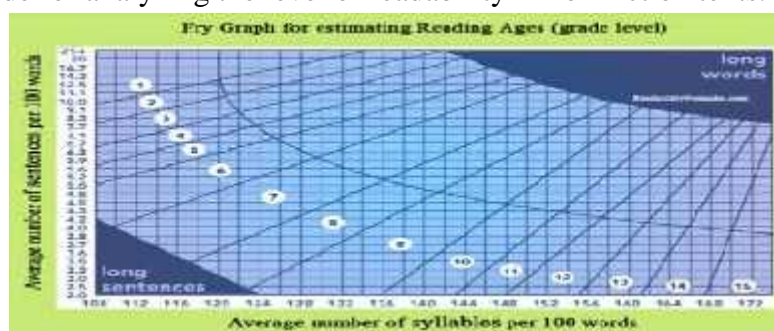

Figure 1. Fry Graph

The calculation steps using the theory of readability of the Fry Graph according to (Harjasujana, 1991) are:

1) The first step is to find or determine the reading material for which the readability level will be calculated.
2) The second step is to start paying attention to the text or reading material whose readability level will be calculated
3) After that, take 100 words from each non-fiction text or reading material that will be analyzed for readability
4) Next is to count the vocabulary of each word in each sentence of each reading material
5) Summing the number of each sentence in each reading material with the quotient between the last word of the sentence that has reached 100 words and the number of the last word in the last sentence
6) Next is to determine the location point of the vocabulary of each reading material, done by multiplying the number of vocabulary from the reading material by the number 0.6. The results of this calculation use the formula from the Fry Graph formula. After knowing the final result of the vocabulary, it can be seen the location of the points that indicate the position of the vocabulary on the Fry Graph. It is necessary to know that the position of the sentence points of each reading material can be known in a horizontal position while the position of the vocabulary points in each reading material can be known in a vertical graphic position. After knowing the position of the two points, it can be concluded that the position of the two points indicates the level of readability of each reading material. If the points are in areas 1, 2, 3 then the reading material is appropriate and suitable for reading by elementary school children in grades 1, 2 and 3, if the location of the points on the graph shows in areas 4, 5, and 6 then it can be concluded that the reading material is suitable and suitable for 4th, 5th, and 6th graders to read.

These steps will be used as guidelines for analyzing the readability of ten non-fiction texts of Kediri Raya local wisdom in Android-based interactive multimedia for grade 4 elementary school. The readability analysis of ten non-fiction texts was calculated according to the theory of calculation in the Fry Graph.

Results and Discussion

To analyze the readability of ten non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia aimed at grade 4 elementary school students, researchers will sort and take from each non-fiction text that will analyze the readability level of 100 words. Non-fiction texts that will be analyzed include non-fiction texts of local wisdom in the Kediri area entitled "Tahu Takwa" and "Surowono Temple", non-fiction texts of local wisdom from the Blitar area entitled "Batik Tutur" and "Penataran Temple", non-fiction texts of local wisdom from the Tulungagung area entitled "The Jamasan Tombak Kyai Upas Ceremony" and "Ayam Lodho", non-fiction texts of local wisdom from the Trenggalek area entitled "The Larung Sembonyo Ceremony" and "Alen-alen", and the last non-fiction text from local wisdom from the Nganjuk area which entitled "Siraman Sedudo Ceremony" and "Ngetos Temple". The calculation results can be seen in the following table.

1). Results of the Calculation of Readability Level of Kediri Local Wisdom Non-Fiction Text "Tahu Takwa".

Table 1. One hundred words of non-fiction text "Tahu Takwa"

Sentence to-	Amount word	Number of Syllables
1	12	28
2	14	32
3	9	23
4	8	15
5	12	31
6	11	30
7	18	41
8	19	42
Amount	100	242

Based on the description of the table above, the number of sentences is 8. The last sentence consists of 24 words, and the text of exactly 100 words in the 19th word can be calculated as: $19/24 = 0.79$. Then, the results are added up with the number of sentences, namely $8 + 0.79 = 8.79$. Meanwhile, the number of syllables contained in this text is 242 syllables which is calculated by multiplying 0.6 by 242 (the number of syllables). Obtained $242 \times 0.6 = 145.2$. From this calculation, it can be seen that the fry graph shows the meeting point is at level 3, or the non-fiction text of Kediri local wisdom entitled "Tahu Takwa" is suitable for reading in grade 3 elementary school.

2). Results of the Calculation of Readability Level of the Kediri Local Wisdom Nonfiction Text "Surowono Temple".

Table 2. One hundred words of non-fiction text "Surowono Temple"

Sentence to-	Amount word	Number of Syllables
1	10	29
2	13	31
3	22	62
4	7	22
5	9	21
6	11	29
7	19	46
8	9	21
Amount	100	261

Based on the description of the table above, the number of sentences is 8. The last sentence consists of 33 words, and the text of exactly 100 words in the 9th word can be calculated by: $9/33 = 0.27$. Then, the results are added up with the number of sentences, namely $8 + 0.27 = 8.27$. Meanwhile, the number of syllables contained in this text is 261 syllables which is calculated by multiplying 0.6 by 261 (the number of syllables). We get $261 \times 0.6 = 156.6$. From this calculation, it can be seen that the fry graph shows the meeting point is at level 3, or the non-fiction text of Kediri local wisdom entitled "Surowono Temple" is suitable for reading in grade 3 elementary school.

3). Results of the Calculation of Readability Level of Blitar Local Wisdom Non-Fiction Text "Batik Tutur".

Table 3. One hundred words of non-fiction text "Batik Tutur"

Sentence to-	Amount word	Number of Syllables
1	14	35
2	12	26
3	16	45

4	8	22
5	9	23
6	12	27
7	9	24
8	11	29
9	16	42
10	3	6
Amount	100	279

Based on the description of the table above, the number of sentences is 10. The last sentence consists of 17 words, and the text of exactly 100 words in the 3rd word can be calculated as: $3/17 = 0.17$. Then, the results are added up by the number of sentences, namely $10 + 0.17 = 10.17$. Meanwhile, the number of syllables contained in this text is 279 syllables which is calculated by multiplying 0.6 by 279 (the number of syllables). We get $279 \times 0.6 = 167.4$. From this calculation, it can be seen that the fry graph shows the meeting point is at level 2, or the non-fiction text of Blitar local wisdom entitled "Batik Tutur" is suitable for reading in grade 2 elementary school.

4). Results of the Calculation of Readability Level of Blitar Local Wisdom Non-Fiction Texts "Penataran Temple".

Table 4. One hundred words of non-fiction text "Penataran Temple"

Sentence to-	Amount word	Number of Syllables
1	18	46
2	9	19
3	14	31
4	14	31
5	11	44
6	10	23
7	15	40
8	9	21
Amount	100	255

Based on the description of the table above, the number of sentences is 8. The last sentence consists of 11 words, and the text of exactly 100 words in the 9th word can be calculated as: $9/11 = 0.81$. Then, the results are added up with the number of sentences, namely $8 + 0.81 = 8.81$. Meanwhile, the number of syllables contained in this text is 255 syllables which is calculated by multiplying 0.6 by 255 (the number of syllables). Obtained $255 \times 0.6 = 153$. From this calculation, it can be seen that the fry graph shows the meeting point is at level 3, or the non-fiction text of Blitar local wisdom entitled "Penataran Temple" is suitable for reading in grade 3 elementary school.

5). Results of the Calculation of Readability Level of Tulungagung Local Wisdom Non-Fiction Text "The Jamasan Tombak Kyai Upas Ceremony".

Table 5. One hundred words of non-fiction text "The Jamasan Tombak Kyai Upas Ceremony"

Sentence to-	Amount word	Number of Syllables
1	18	50
2	18	51
3	20	52
4	7	23
5	23	61
6	13	31
7	1	3
Amount	100	271

Based on the description of the table above, the number of sentences is 7. The last sentence consists of 13 words, and the text of exactly 100 words in the 1st word can be calculated by: 1/13 = 0.07. Then, the results are added up with the number of sentences, namely 7 + 0.07 = 7.07. Meanwhile, the number of syllables contained in this text is 271 syllables which is calculated by multiplying 0.6 by 271 (the number of syllables). We get 271 x 0.6 = 162.6. From this calculation, it can be seen that the fry graph shows the meeting point is at level 4, or the non-fiction text of Tulungagung local wisdom entitled "The Jamasan Tombak Kyai Upas Ceremony" is suitable for reading in grade 4 elementary school.

6). Results of the Calculation of Readability Level of Tulungagung Local Wisdom Non-Fiction Text "Ayam Lodho".

Table 6. One hundred words of non-fiction text "Ayam Lodho"

Sentence to-	Amount word	Number of Syllables
1	9	21
2	9	21
3	10	23
4	11	23
5	21	46
6	20	48
7	10	23
8	7	15
9	3	6
Amount	100	226

Based on the description of the table above, the number of sentences is 9. The last sentence consists of 16 words, and the text of exactly 100 words in the 3rd word can be calculated by: 3/16 = 0.18. Then, the results are added up by the number of sentences, namely 9 + 0.18 = 9.18. Meanwhile, the number of syllables contained in this text is 226 syllables which is calculated by multiplying 0.6 by 226 (the number of syllables). We get 226 x 0.6 = 135.6. From this calculation, it can be seen that the fry graph shows the meeting point is at level 2, or the non-fiction text of Tulungagung local wisdom entitled "Ayam Lodho" is suitable for reading in grade 2 elementary school.

7). Results of the Calculation of Readability Level of Trenggalek Local Wisdom Non-Fiction Text "The Larung Sembonyo Ceremony".

Table 7. One hundred words of non-fiction text "The Larung Sembonyo Ceremony"

Sentence to-	Amount word	Number of Syllables
1	20	55
2	16	40
3	32	83
4	15	41
5	17	46
Amount	100	265

Based on the description of the table above, the number of sentences is 5. The last sentence consists of 23 words, and the text of exactly 100 words in the 17th word can be calculated by: 17/23 = 0.73. Then, the results are added up with the number of sentences, namely 5 + 0.73 = 5.73. Meanwhile, the number of syllables contained in this text is 265 syllables which is calculated by multiplying 0.6 by 265 (the number of syllables). It is obtained that 265 x 0.6 = 159. From this calculation, it can be seen that the fry graph shows the meeting point is at level 6, or the non-fiction text of Trenggalek local wisdom entitled "The Larung Sembonyo Ceremony" is suitable for reading in grade 6 elementary school.

8). The Results of the Calculation of the Readability Level of the Trenggalek Local Wisdom Non-Fiction Text "Alen-alen".

Table 8. One hundred words of non-fiction text "Alen-alen"

Sentence to-	Amount word	Number of Syllables
1	9	23
2	14	30
3	11	23
4	11	31
5	8	22
6	8	17
7	7	17
8	16	38
9	7	20
10	9	22
Amount	100	243

Based on the description of the table above, the number of sentences is 10. The last sentence consists of 10 words, and the text of exactly 100 words in the 9th word can be calculated by: 9/10 = 0.9. Then, the results are added up by the number of sentences, namely 10 + 0.9 = 10.9. Meanwhile, the number of syllables contained in this text is 242 syllables which is calculated by multiplying 0.6 by 243 (the number of syllables). Obtained 243 x 0.6 = 145.8. From this calculation, it can be seen that the fry graph shows the meeting point is at level 2, or the non-fiction text of Trenggalek local wisdom entitled "Alen-alen" is suitable for reading in grade 2 elementary school.

9). Results of Calculation of Readability Level of Nganjuk Local Wisdom Non-Fiction Text "Ngetos Temple".

Table 9. One hundred words of non-fiction text "Ngetos Temple"

Sentence to-	Amount word	Number of Syllables
1	14	36
2	10	25
3	7	13
4	23	60
5	16	32
6	18	44
7	11	30
8	1	3
Amount	100	243

Based on the description of the table above, the number of sentences is 8. The last sentence consists of 9 words, and the text of exactly 100 words in the 1st word can be calculated by: 1/9 = 0.1. Then, the results are added up by the number of sentences, namely 8 + 0.1 = 8.1. Meanwhile, the number of syllables contained in this text is 243 syllables which is calculated by multiplying 0.6 by 243 (the number of syllables). Obtained 243 x 0.6 = 145.8. From this calculation, it can be seen that the fry graph shows the meeting point is at level 3, or the non-fiction text of Nganjuk local wisdom entitled "Ngetos Temple" is suitable for reading in grade 3 elementary school.

10). Results of the Calculation of Readability Level of Nganjuk Local Wisdom Nonfiction Text "Siraman Sedudo Ceremony".

Table 10. One hundred words of non-fiction text "Siraman Sedudo Ceremony"

Sentence to-	Amount word	Number of Syllables
1	11	29
2	19	40

3	14	32
4	20	52
5	6	15
6	27	69
7	3	7
Amount	100	244

Based on the description of the table above, the number of sentences is 7. The last sentence consists of 5 words, and the text of exactly 100 words in the 3rd word can be calculated by: 3/5 = 0.6. Then, the results are added up by the number of sentences, namely 7 + 0.6 = 7.6. Meanwhile, the number of syllables contained in this text is 244 syllables which is calculated by multiplying 0.6 by 244 (the number of syllables). Obtained 244 x 0.6 = 146.4. From this calculation, it can be seen that the fry graph shows the meeting point is at level 4, or the non-fiction text of Nganjuk local wisdom entitled "Siraman Sedudo Ceremony" is suitable for reading in grade 4 elementary school. From the calculation of the readability level of ten non-fiction texts in interactive multimedia based on Android, the results show that the readability level of ten non-fiction texts has the feasibility and suitability of the readability level for 4th grade elementary school students, according to (Harjasujana A. S., 1996) the readability level of a reading material is said to be in accordance with the age of the child if the results of the Fry Graph show the same area as the grade level for the child. Another study conducted by (Khusnaini, 2020) showed that the readability level of a reading material entitled "Rabbit and Turtle" was in area 5, which means the reading material is suitable for grades 4, 5, and 6 of elementary school. Because the readability level of these ten non-fiction texts is in areas 2, 3, 4 and 6, it means that the non-fiction text of Kediri Raya local wisdom in this android-based interactive multimedia is suitable and appropriate for grades 2, 3, 4 and 6 elementary schools.

Conclusion

The conclusion obtained from the results of this study is that the calculation of the readability level using the Fry Graph formula on ten non-fiction texts containing Kediri Raya local wisdom in Android-based interactive multimedia that can be downloaded on the Google Play Store has a readability level suitability that can be said to be feasible for elementary school children. grade 4, because the readability level of the ten non-fiction texts is in areas 2, 3, 4 and 6 which means the non-fiction text of Kediri Raya local wisdom in Android-based interactive multimedia is suitable and appropriate for grades 2, 3, 4 and 6 elementary school.

Recommendation

The recommendation from the results of this study is that parents or teachers can be more selective in choosing reading materials for children by paying attention to the level of readability of a reading material, because the level of readability greatly affects how children understand the content or messages contained in the readings they read. To find out the level of readability according to the age of the child, you can use the theory of readability from the Fry Graph formula.

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