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Norms of Distribution of Readability Variables Selected to Develop Readability Formula for Kannada Language

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ABSTRACT

Readability formula is a predictive device to determine the extent of readability of selected written material in general and agricultural publications in particular. The foremost purpose of every readability formula is to serve as a good yardstick to measure the readability level of the passage analysed and also to provide guidelines and procedures for the writers to make their writing readable. With this purpose in view, readability formula was specifically developed for the study. The developed readability formula was found appropriate to describe in detail the norms of distribution of the three readability variables with reference to different school levels. Word length, Average sentence length and Percentage technical words were the readability variables selected for the study. The norms of distribution in terms of mean, standard deviation and range of the three readability variables are presented for three categories viz., Primary school, Middle school, and High school level. Further it was also essential to know the relationship between the readability formula developed and the earlier formulae developed in Kannada language. For this purpose, 20 articles were selected from Krishi Vignana journal for illustrating the application of present formula and analyzed using the earlier readability formulae. Results revealed that there was a significant relationship between the developed readability formulae with the readability formula developed by earlier social scientists. The formula will be particularly helpful for prior testing of written material before publishing it for the benefit of readers in general and farmers in particular. The norms of distribution developed will be helpful to comprehend more accurately which type of words and sentence they can use while writing for a particular type of readers.

Keywords

Readability, Written materials, Kannada language, Readers, School levels

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Introduction

Print media is one of the most trusted and popular source of information for the public and it continues to play a vital role in generating and shaping public opinion in the country. In a country where agriculture is predominant occupation, nothing seems more

important in agriculture development than the dissemination of latest agricultural information among the farming community.

The present day writers have a challenge of presenting the information in the most simplest and understandable form to reach the audience. A piece of writing is readable if it

could be read and understood by the readers for whom it is intended (Anonymous, 1963). Readability is the indication of level of comprehension of a written or published material as measured by any method of measuring readability. The readability is expressed in terms of reading difficulty or reading ease of a written or published material.

Many research studies have been conducted in the past to develop readability formula to measure the readability in an accurate and scientific manner. Readability formula is a predictive device to determine the extent of readability of selected written material *i.e.*, journals, folder/leaflets, feature article of newspaper and other agricultural publications in particular or other publication in general.

There are no simple, convenient alternatives (to readability formulas) that would assign more accurate levels. Readability formula is the only objective method for determining the difficulty of written texts and studies have shown that readability formula correlate well with methods of measuring readability as measured by reading tests.

A readability formula is a predictive method. It is a technique of estimating the possible success a reader will have in reading and understanding a piece of writing. It recognizes the elements in writing that are related to reader's success. Readability formula provides an estimate of the difficulty of writing without requiring the reader to read it and undergo tests on it. In this context, readability formula is considered as a diagnostic and clinical tool in the pathology of communication. In this backdrop, the present study was carried out with the following specific objectives:

To develop the norms of distribution of readability variables

To find out the relationship between the readability formula developed for the study with the earlier formulae.

Materials and Methods

The present study was carried out during 2017-2018 at University of Agricultural Sciences, Bangalore. In the present study, the Kannada and Science text books prescribed by the Government of Karnataka from 2nd to 10th standards were selected as criterion passages for the study. From each of the 15 text books considered, every 10th page was selected as sample for the measurement of readability variables. The total number of passages selected were 141.

The readability variables constituted were Word length(WL), Average sentence length (ASL), and Percentage technical words (PTW). The data were subjected to correlation analysis. The variables showing positive and significant relationship with respect to grade level were considered for development of readability formula.

In the next step regression analysis was employed to ascertain the extent of variation caused by the three independent variables and also to obtain the values of constant and the regression coefficients. Based on the values pertaining to the constant and the regression coefficients in the results the readability formula was developed for predicting the grade level of the passages.

Norms of distribution of readability variables for different school levels

The foremost purpose of every readability formula is to serve as a good yardstick to measure the readability level of the passage analysed and also to provide guidelines and procedures for the writers to make their writing readable. With this objective in view,

it was found appropriate to describe in detail the norms of distribution of the three readability variables with reference to different standards. The three norms worked out for the readability variables were mean, standard deviation and range. The norms of distribution of three readability variables are presented in Table 1 for primary school, middle school and high school level.

Based on the review of literature and critical examination of the factors with reference to their measurement and suitability to Kannada language, three readability variables were selected *viz.*, Word length, Average sentence length and Percentage technical words. Readability variables were measured by following the guidelines developed for the purpose. Word length, Average sentence length and percentage technical words were selected to develop readability formula for the present study as they exhibited higher 'r' values. Readability formula was developed by subjecting the data for regression analysis.

The readability variables, *Viz.*, Word length (WL), Average sentence length (ASL) and Percentage technical words (PTW) were measured for each of the school level and were analyzed to work out mean, standard deviation and the range. The figures relating to these statistics are presented for primary school, middle school and high school standard, separately. This was done with an intension of providing a basis for the writers to orient their writing to a given levels of readers.

Relationship between the Readability formula developed for the study with the earlier formulae

Twenty articles were selected from KrishiVignana journal (published by University of Agricultural Sciences, Bangalore) for illustrating the application of present formula developed were also analysed

using the readability formula developed earlier by Nanjappa (1992) and Nomesh Kumar (2002).

The Readability formula obtained on the basis of regression analysis in the present study reads as follows:

$$GL = -4.45 + 1.425 x_1 + 0.7262 x_2 + 0.0437 x_3$$

Where,

GL= Grade level

x_1 = Word Length (WL)

x_2 = Average Sentence Length in words (ASL)

x_3 = Percentage Technical words (PTW)

The Readability formula developed by Nanjappa (1992) estimates the reading ease in terms of grade level.

$$GL_{50} = -7.4232 + 0.6509 ASL + 0.0177 WC$$

Where,

GL_{50} = Grade level scores of the students who could answer one half of the test questions correctly.

ASL = Average sentence length in words

WC = Syllables per 100 words (Word Complexity)

The Readability formula developed by Nomesh Kumar (2002) estimates the reading ease as follows,

$$R.E = 120.85 - 0.6246x_1 - 1.8170 x_2$$

Where,

R.E= Reading ease scores

X_1 = percentage of polysyllable words

X_2 = Average sentence length in words

Correlation test was applied to know the nature and extent of relationship between readability scores obtained by earlier formulae with the present formula developed in Kannada language.

Results and Discussion

Norms of distribution of readability variables for different school levels

Primary school (2ndStd to 4thStd)

The norms of distribution shown a definite trend (Table 1). With respect to the word length, the letters per word in case of primary school level ranged from 2 to 4 letters having the mean value of 3.28 and standard deviation of 0.36. The average sentence length in words for primary school level ranged from 3 to 9 words with the mean value of 5.53 and standard deviation of 1.10. The percentage technical words ranged upto 4 words for primary school level with the mean value of 0.51 and standard deviation of 0.83.

Middle school (5thStd to 7thStd)

With respect to middle school level the word length ranged from 3 to 4 letters per word with the mean value of 3.7 and the standard deviation of 0.34. The average sentence length in words ranged from 5 to 9 words per sentences in case of middle school level with the mean value of 8.03 and standard deviation of 1.06. The percentage technical words ranged from 1 to 24 words in case of middle school level with the mean value of 4.49 and the standard deviation of 5.05.

High school (8thStd to 10thStd)

The word length in case of high school level ranged from 2 to 5 letters per word with the mean value of 3.84 and standard deviation of 0.27. The average sentence length in words for high school level ranged from 6 to 13 words with the mean value of 9.37 and the standard deviation of 1.21. The percentage technical words in high school level ranged from 3 to 38 words with the mean value of 8.14 and the standard deviation of 6.05

These results revealed that there is a scope to vary the word length, percentage technical words and average sentence length in manipulating the level of readability. Longer the words and longer the sentences higher was the standard level and vice-versa. The results are in conformity with Lively and Pressey (1923), Nanjappa (1992) and Nomesh Kumar (2002).

The norms of distribution of WL, ASL and PTW presented for the various standards will be helpful in writing for specific standard levels. If the intension of the communicator is to write at the level of middle school the range of three readability variables that could be used is 3 to 4 letters per word, 5 to 9 words per sentence and 1 to 23 percentage technical words. While using this range, it is desirable to restrict to the middle values of the range.

Relationship between the present formula with the earlier formulae

Relationship between different formulas developed for Kannada language is portrayed in Table 2. Readability formula developed by Nanjappa (1992) and Reading Ease formula developed by Nomesh Kumar (2002) and the developed readability formula were analysed to know the relationship. Using 20 articles of *KrishiVignana* journal the readability scores were found out by applying said three readability formulas as shown in Table 3. The results indicated that there was a positive and highly significant relationship between the developed readability formula with the formula developed by Nanjappa, r value being 0.98. Further, there was a negative and significant relationship between developed readability formula with the reading ease formula developed by Nomesh Kumar with the r value of -0.67 implied that as grade level score of present formula increases the reading ease score of Nomesh Kumar formula decreases.

Table.1 Mean, standard deviation and range of the three readability variables with respect to primary, middle and high school level

Category	Word length			Average sentence length			Percentage technical words		
	Mean	SD	Range	Mean	SD	Range	Mean	SD	Range
Primary School	3.28	0.36	2.60–3.83	5.53	1.10	3.83–8.50	0.51	0.83	0.10–3.84
Middle school	3.70	0.34	3.04–4.36	8.03	1.06	5.29–9.88	4.49	5.05	1.00–23.97
High School	3.84	0.27	2.77–4.52	9.37	1.21	6.47–13.25	8.14	6.05	3.47–38.63

Table.2 Correlation matrix of readability scores between the present formula with the earlier formulae

Particulars	Present formula (2017)	Nanjappa (1992)	Nomesh Kumar (2002)
Formula developed for the study (2017)	1		
Nanjappa (1992)	0.98**	1	
Nomesh Kumar (2002)	-0.67**	-0.68**	1

**Significant at 1% level

Table.3 Readability values obtained from the application of Readability formula developed for the study and earlier formulae

Chapter Number	Readability formula developed (2017)	Nanjappa (1992)	Nomesh Kumar (2002)
1	15.46	13.96	71.57
2	14.59	9.53	76.67
3	17.59	13.99	81.02
4	13.64	11.09	74.09
5	17.47	15.89	60.45
6	11.12	9.74	77.62
7	11.30	11.29	75.19
8	11.78	10.38	77.27
9	10.88	7.37	87.49
10	11.38	8.85	86.57
11	10.97	11.41	73.77
12	10.20	11.03	78.69
13	10.10	10.15	82.41
14	10.15	9.41	77.71
15	8.65	8.32	84.46
16	9.18	13.14	87.50
17	9.85	16.78	57.12
18	8.88	10.43	76.72
19	8.91	8.51	75.02
20	9.04	8.33	76.55

Table 2 revealed that there was a significant relationship between present readability formulae with the formula developed by Nanjappa (1992) and Nomesh Kumar (2002).

This might be due to that in the readability formula developed by Nanjappa (1992) and Nomesh Kumar (2002) also used the relevant readability variables related to sentence factor and word factor; however in the present formula has considered the percentage technical words (PTW) as an additional variable.

The readability formula developed in the present study has direct application in the field of education, mass communication, journalism and agricultural extension. The norms of distribution developed will be helpful to comprehend more accurately which type of words and sentence they can use while writing for a particular type of readers. In order to use the formula developed by Nanjappa (1992) it is required to have the knowledge of 'Chanduss' in Kannada language by the analyst. Further, in the formula developed by Nomesh Kumar (2002) the analyst of that formula required to have the knowledge of polysyllable and monosyllable words in Kannada. In the developed readability formula the measurement of the word length in terms of

the letters per word is easier and also the list of technical words is provided so that the presence of number of technical words/percentage technical words may be calculated easily. However the sentence length in words (ASL) is common with respect to all the three formulae.

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