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Development of Readability Formula for Kannada Language

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Abstract

An attempt has made to develop readability formula for Kannada language in the present study using text books (2nd to 10th standard) of kannada and science state syllabus in which 141 sample criterion passages were selected. The samples have been analyzed with reference to readability variables like Word length (WL), Average sentence length (ASL) and Percentage technical words (PTW). The three readability variables had positive and significant relationship with respect to grade level. The correlation values of the variables corresponding to the grade level were ASL(0.74), WL(0.46) and PTW(0.47). Hence, these variables were considered in the development of readability formula. The readability formula obtained on the basis of regression analysis reads as GL=-4.45+1.425(WL)+ 0.7262(ASL)+0.0437(PTW). Where, GL= grade level estimated, x_1= WL, x_2= ASL and x_3= PTW. The variation in the grade level was explained to the extent of 63 per cent by these three independent variables (R^2=0.63). The developed formula be used by the communicators, writers and authors to know the grade level of the writing and it could be also used as a guideline in modifying their writing to make it readable to the intended audience.

Keywords: Readability, agricultural publications, feature article, agricultural journalism

In a country where agriculture is predominant occupation, communication of scientific information to farmers is a vital element in the process of agricultural development. Print media serve as potential source of information to the audience in terms of accuracy, preservability, timeliness and understanding of the message by reader. In view of increased literacy over the last few decades, the print media have acquired greater importance in the education of farmers. The increase in literacy level to 75.60 per cent in Karnataka during 2011 implies that three fourth of the farming population can make use of print media effectively. Hence, the print media has greater potentials in the present situation. Besides newspapers and farm magazines, the agricultural universities publish a large number of books, booklets, bulletins and brochures related to farming on a regular basis. These publications are published in local language so that they can reach and have an impact on the rural readers. 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 said to be readable if it could be read and understood by the readers for whom it is intended (Anon., 1963).

Readability is the indication of level of comprehension of a written or published material as measured by any method of measuring readability (Klare, 1984). The readability is expressed in terms of reading difficulty or reading ease of a written or published material. Readability formula is a predictive device to determine the extent of readability of selected written material. It is useful to know the readability levels of agricultural publications in particular and other publication in general. It recognises 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 (Klare, 1963). In this context readability formula is considered as a diagnostic and clinical tool in the pathology of communication (Flesch, 1951). Readability formulas are the only objective method for determining the difficulty of written texts and studies have shown that readability formulas correlate well with comprehension difficulty as measured by reading tests (Du Bay, 2004). Eventhough, a lot of research has been made to measure readability in English language, only a beginning is made in this direction in Kannada language. The aforesaid preamble emphasized the

need for developing readability formula for Kannada language. With this background, the present study was conducted with the following specific objectives :

1) To develop and standardize readability formula for kannada language and

2) To measure the reading is of agricultural publications of the university using the developed formula.

METHODOLOGY

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).

Word length : This refers to the number of letters or alphabets contained in a word. e.g. the word 'I' has one letter and the word 'you' has three letters.

Calculation of word length : This variable was measured by adopting the following formula

$$Word\ length = \frac{Number\ of\ letters\ in\ a\ passage}{Number\ of\ words\ in\ that\ passage}$$

Calculation of Average sentence length:

This variable was measured by adopting the following formula.

$$Percentage\ Tech.words(PTW) = \frac{Number\ of\ technical\ words\ in\ a\ passage}{Total\ number\ of\ words\ in\ a\ passage} \times 100$$

Technical word: Technical words are operationally defined asthe wordsrelating to a particular subject, art, or craft, or its techniques which requires special knowledge to understand.Each of the technical word occurred in the passage should be counted separately and recorded even when it appeared more than once (Dale and Tyler, 1934)

Calculation of Technical words per 100 words: This variable was measured by adopting the following formula

$$Percentage\ Technical\ words(PTW) = \frac{Number\ of\ technical\ words\ in\ a\ passage}{Total\ number\ of\ words\ in\ a\ passage} \times 100$$

At the first instance the data were subjected to correlation analysis. The variables showing positive and significant relationship with respect to grade level were considered for the development of readability formula. The three variables WL, ASL and PTW were selected to develop readability formula for the present study as they exhibited higher 'r' values. 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.In order to serve as an illustration of use of the formula developed, the readability formula developed in the current study was applied to the farm journal published by UAS, Bengaluru and reading ease of the selected articles were measured.

It was decided to apply correlation test to know the nature and extent of relationship. The three readability variables selected for analysis and development of readability formula were: (i) Average Sentence Length, (ii) Word Length and, (iii) Percentage of Technical Words (PTW). In accordance with the guidelines of using present readability formula, 10 samples from 'KrishiVignana' journal and five farm folders were drawn and readability variable were analysed. The WL, ASL and PTW were measured.

Directions for the application of readability formula

Readability formula is being applied by variety of people in different fields of communication and education. In this situation it is essential to use guidelines or the directions for the application of the formula.

While selecting samples, take about 100 words from every tenth page in case of books. Never begin or end a sample in the middle of sentence. In methodology the procedures involved in measurement of variables using the formula have been explained.

*Counting of words :*A word consisting letters or alphabets, denotes a specific meaning of its own. One word is separated from the other usually by one more type spaces in the typed or printed passage. Word is any single symbol used in writing and classifiable among parts of speech. The following procedure need to be used in counting the words.

1. Count all noun forms as one word.
2. All the hyphenated words were counted as one word.
3. In counting the words, an abbreviation is counted as one word. U.S.A is counted as one word
4. The words relating to numbers were written as they are usually pronounced before counting. *e.g.,* Nineteen forty seven for 1947.

*Counting of sentences :*A sentence is a group of words, which is marked off by periods like full stop, exclamatory mark and question mark. Small headings, which do not have the quality of a sentence, are not considered for counting of sentence.

Counting of Technical words: Technical words are the words relating to a particular subject, art or craft or its techniques which requires special knowledge to understand. *e.g.,* Nitrogen fixation, infiltration, transplanting *etc.* each of the technical word occurred in the passage should be counted separately and recorded even when it appeared more than once. After analysing the readability variables occurred in the passages it should be simplified in the developed formula by multiplying with regression co-efficients. Further, round off the obtained fractional value to the nearest whole number to attain the grade level of the sample passages.

Results and Discussion

As revealed from the data in the Table I, the value of correlation coefficient between grade level and WL was 0.46, while that between PTW and grade level was 0.47. Grade level and ASL had shown highest correlation coefficient value of 0.74. All these three variables were positively and significantly related to grade level. Inter correlation between ASL and PTW was 0.38, while ASL and WL was 0.46 and between PTW and WL was 0.46, which was significant at 0.01 level of probability.Hence, they were considered in the development of readability formula.

Table I

Correlation between grade level and readability variables

(n=141)

	Grade level	WL	ASL	PTW
Grade level	1			
WL	0.4645**	1		
ASL	0.7474**	0.4696**	1	
PTW	0.4761**	0.4674**	0.3844**	1

Using the readability variables, the readability formula was developed with regression formula.

$$Y = a + b_1x_1 + b_2x_2 + b_3x_3 \ldots\ldots\ldots bnxn$$

Where, Yis the dependent variable to be estimated
'a' is the constant
b_1, $b_2$and b_3 are the estimted regression coefiicients
x_1, x_2 and x_3 are the independentvariables

Regression weights presented in Table II were utilized for fitting regression equation.The coefficient of determination indicates the amount of variation in the grade level explained by WL, ASL and PTW combined with the regression weights used. The value of R^2 was 0.63.Higher value of multiple correlation in the present study indicates the strength of relationship between readability variables and grade level.

Table II

Regression analysis of grade level with independent variables

(n=141)

Variable	Regression Coefficient b)	SE of Regresco effient(Seb)	t' value	A	R^2	F
WL	1.425	0.377	3.78			
ASL	0.7262	0.0743	9.78			
PTW	0.0437	0.0183	2.39	-4.45	0.63	80.58

TABLE III

Grade level of articles published in Krishi Vignana published by UAS, Bengaluru

Article No	WL	ASL	PTW	Readability value	Grade level	Range of readability
1	3.83	10.8	0.92	8.89	9	High school
2	3.86	16.71	5.98	18.30	18	>PUC
3	3.66	19.01	2.25	14.64	15	>PUC
4	3.58	8.30	0.00	6.67	7	Middle school
5	3.31	15.10	3.67	11.38	11	PUC
6	3.81	12.21	0.81	9.85	10	High shool
7	4.03	22.16	2.25	17.38	17	>PUC
8	3.70	14.01	0.00	10.98	11	High school
9	4.16	14.10	0.00	11.65	12	PUC
10	3.83	13.75	0.00	10.98	11	High school

TABLE IV

Grade level of farm folders published by UAS, Bengaluru

Article No	WL	ASL	PTW	Readability value	Grade level	Range of readability
1	3.69	15.20	0.00	11.83	12	PUC
2	3.51	13.51	1.63	10.42	10	High school
3	3.43	15.00	0.83	11.35	11	PUC
4	3.38	9.36	1.94	7.23	7	Middle school
5	3.15	9.90	1.01	7.25	7	Middle school

Using these values, the following readability formula was obtained:

$GL = -4.45 + 1.425X_1 + 0.7262\, x_2 + 0.0437\, x_3$

Where, GL= Grade level

x_1= Word length (WL)

x_2=Average Sentence Length (ASL)

x_3= Percentage Technical words (PTW)

In order to measure the grade level of any passages, there is a need to measure the WL, ASL and PTW of the intended passage and substitute the figures in the formula.

Application of the formula on agricultural publication

The data on this aspect are denoted in Table III and Table IV. The results specified that among 10 articles in the journal 40 per cent of articles belonged to 8th to 10th standard, 30 per cent belonged to more than 12th standard followed by nearly 20 per cent of articles belonged to 11th and 12th standard and only 10 per cent of articles belonged to middle school level difficulty. Majority of the articles in farm folders belonged to below college level (60%) and 40 per cent of the articles belonged to middle school level. This indicates that majority of the articles belonged to high school level of difficulty.

Majority of the articles published in Krishi Vignana are below to High School level of readability. The readability formula developed has direct application in the field of education, mass communication, journalism and agricultural extension. The developed formula can be used by the communicators, writers and authors to know the grade level of any written or published material. By using the readability formula developed, it is possible to analyse the already published extension literature and other publications to determine their suitability to the intended readers. This work will provide the required feedback for communicators and writers to appropriately modify the writings for the benefit of intended readers.

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