

Assessing the Difficulty Index of Available Course Materials in General Education Subjects

Jaime M. Forbes¹, Yolanda D. Reyes²

Abstract: *To have a sustainable learning outcome there must be availability of quality course materials for the students; it is also used by the public in determining the quality of education the students are expected to receive. Bataan Peninsula State University (Balanga Campus) is not an exception in this regard. Therefore, the researchers are interested in assessing the difficulty index of available course materials among general education students; which is a criterion for determining quality. In this respect, the survey method was used to generate responses. First year students of the College of Education and the available printed textbooks being used by these students in their general education subjects form the population of the study. The descriptive method of research will be used and survey method will be used in the collection of data. For the purpose of this research, the students' population will be restricted to BPSU (Balanga Campus, College of Education students). Following this, the Gunning's Fog Index, Flesch Reading Ease, Cloze text and Row tree's Complexity Quotient were used to assess the difficulty index of selected course materials; while questionnaires were designed to elicit data from the learners and teachers to get their perception on the content, format and language of the course materials including any other opinion they may share. From the findings and the conclusions of the study, it is therefore recommended that: faculty members should be aware of the course materials that they are using. An evaluation of the course materials is encouraged to know that they contain contents that are relevant to the subject being taught.*

Keywords: difficulty index, textbook assessment, flesch index

1. Introduction

Reading difficulties likely occur on a continuum, meaning that there is a wide range of students who experience reading difficulties. There are those students who are diagnosed with a learning disability. There is also an even larger group of students who do not have diagnoses but who need targeted reading assistance.

Many students struggle with reading. One estimate is that about 10 million students have difficulties learning to read. The good news is that 90 to 95 percent of reading impaired students can overcome their difficulties if they receive appropriate treatment at early ages.

The key is for parents and teachers to be aware of how their student or child is doing and to act immediately if they suspect a problem. Parents and teachers cannot necessarily count on a formal diagnosis as the only sign of a significant reading related difficulty.

Some students are more likely to develop reading difficulties than others. It is important to know about these tendencies so students can be monitored and any difficulties caught early. Students may be more likely to develop a reading difficulty if they have parents with histories of reading difficulties; if they have been diagnosed with specific language impairment or a hearing impairment; or if they gained less knowledge or skills related to literacy during preschool years.

Reading approaches have changed quite dramatically over the years. To review only the most recent research would result in only a comparison with the most recent approach, whole language. To provide a more complete picture of the available knowledge base regarding effective reading instruction, the studies reported below cover several decades. This cumulative perspective includes a critique of earlier phonics approaches and other methods, thus providing overall a more balanced perspective.

There is often a wide range of difficulty within a set of reading passages supposedly written at the same level; some are too easy, others appropriately challenging, while others prove frustratingly difficult. First language graded material sometimes provides a suitable alternative but often the same problems arise.

Schemes developed for grading materials in second language publications have generally been based on vocabulary size and difficulty of grammatical structures. In some, sentence length and the number and type of complex sentences is also measured.

Teachers have to assess the linguistic difficulty of a text in order to be able to provide students with reading material at an appropriate level. It is argued that informed judgments by a thoughtful teacher may have advantages over the application of a readability formula. The measures of word difficulty and sentence length that are used by the formulae are shown to have weaknesses: short or familiar words are not easy to read in all contexts, and long sentences are sometimes easier than short ones. An awareness of grammatical constructions which can cause difficulty gives the teacher a principled basis for simplifying a text.

To have a sustainable learning outcome in learning there must be availability of quality course materials for the students, which is one of the criteria considered in any academic program; it is also used by the public in determining the quality of education the students are expected to receive. Therefore, the researcher is interested in assessing the difficulty index of available course materials; which is a criterion for determining quality. The assessment of course materials is not a new phenomenon, educational researchers and practitioners have over the time recognized this.

Course materials are vital tool which determine the progress of any academic institution and the need for availability and quality course materials cannot be overemphasized

Volume 7 Issue 7, July 2018

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

especially where the populace wants to know the quality of knowledge that would be received by the learners; which is a determinant of the quality of products. It therefore means that to attain a sustainable learning outcome, quality course materials must be available.

However, availability of course materials alone is not enough. The difficulty of the text found in the varied course materials should also be taken into account. Text difficulty is determined by looking at the ease the learner would have in comprehending a text and the interest the learner would derive. To be able to match students with appropriate text you need to assess the difficulty of the text to consider using, as well as the likelihood the student s will be motivated to read them. (Hiebert,2005). Hiebert identified the following as factors influencing text difficulty: vocabulary, sentence structure, length, elaboration, coherence and unity, text structure, familiarity of content and background knowledge required, audience appropriateness, quality and verve of the writing, interestingness.

The purpose of this investigation is to determine the characteristics of reading materials representing different levels of difficulty. The concept of difficulty as it applies to most of the standardized materials in education is primarily a statistical concept. The difficulty of an item is generally determined in terms of the number of persons in some group which is able successfully to respond to the item in question. Little is known about the characteristics of the material which is thus statistically located at a given level of difficulty. This is particularly true of reading materials.

With these premises, the researchers would assess the difficulty index of available resource materials of General Education Subjects.

2. Statement of the Problem

The general problem of the study is: What is the difficulty index of available course materials among general education subjects?

Specifically, the study sought answers to the following questions:

1. How may the difficulty index of available course materials be described in terms of:
 - 1.1 vocabulary;
 - 1.2 sentence structure;
 - 1.3 length;
 - 1.4 elaboration
 - 1.5 coherence and unity;
 - 1.6 text structure;
 - 1.7 familiarity of content and background knowledge required;
 - 1.8 audience appropriateness; and
 - 1.9 quality and verve of the writing

Methods of Research

The descriptive method of research will be used. Descriptive research involves "collection of data in order to test hypotheses or to answer questions concerning the current status of the subject of the study." The survey method will be used in the collection of data. "A survey is an attempt to

collect data from members of a population in order to determine the current status of that population with respect to one or more variables". (Gay, 1976).

First year students of the College of Education and the available printed textbooks being used by these students in their general education subjects from the population of the study were considered in finding out the difficulty index of course materials. For the purpose of this research, the students' population will be restricted to BPSU (Balanga Campus, College of Education students.

Research Instruments

A questionnaire was designed to elicit information from the respondents. The questionnaire has three main sections – content, format and language. The items were drawn to get the students' feeling about the three main areas which determine the quality of course materials. In addition to the main sections, a section was set aside for free comments. The items designed were required to be answered by 'yes' or 'no' answer. The validity and reliability of the instrument was tested using content and construct validity; and split-half reliability after which a pre-test of the questionnaire was carried out before it was finally administered to the selected respondents.(Pearson 1999-2000).

Statistical Treatment

The researchers used Gunning's Fog Index, Flesch Reading Ease, Cloze Text and Rowntrees's Complexity Quotient to assess the course materials measuring the level of reading difficulty of the course materials.

Gunnings's Fog Index or Modified Gunning Fog Index was used in measuring the level of reading difficulty of the course materials. The modified Fog Index helps in measuring the 'reading age' of a particular text. It is also important to know that the use of technical terms or jargon can increase Fog Index scores. However, Flesch Reading Ease is another formula for calculating reading age. Cloze Test is also used for testing readability. In addition, Complexity Quotient is another way of testing the readability of a text.

3. Summary of the Research Findings

The next tables would present the summary of the previous ones and the result of the other methods used to assess the course materials' level of reading difficulty, such as Gunning's Fog Index or Modified Gunning Fog Index, Flesch Reading Ease, Cloze Test and Rowntrees's Complexity Quotient.

Gunning's Fog Index or Modified Gunning Fog Index is used to confirm that text can be read easily by the intended audience. Texts for a wide audience generally need a fog index less than 12. Texts requiring near-universal understanding generally need an index less than 8.

In Flesch Reading Ease the higher the number, the easier the text is to read. Scores between 90.0 and 100.0 are considered easily understandable by an average 5th grader. Scores between 60.0 and 70.0 are considered easily understood by 8th and 9th graders. Scores between 0.0 and 30.0 are considered easily understood by college graduates.

This table could also help us assess the ease of readability in a document.

90-100: Very Easy
 80-89: Easy
 70-79: Fairly Easy
 60-69: Standard
 50-59: Fairly Difficult

30-49: Difficult
 0-29: Very Confusing
 Meanwhile, once the score from the Rowntrees's Complexity Quotient exceeds 3, the text is considered difficult. Using Cloze Test, we can determine the workbook's readability. A 60% score is considered satisfactory for comprehension, while 40 – 60% indicates partial comprehension, and less than 40% indicates inadequate comprehension.

Table I: Summary of First Semester Data

First Semester AY 2011-2012

Title of the book	Content			Format			Language Used			Modified Fog Index	Flesch Reading Ease	Reading complexity	Cloze test	No. of words
	% Yes	% No	% NR	% Yes	% No	% NR	% Yes	% No	% NR					
Physics and Its Essentials	74.8%	9.3%	15.9%	84.43%	7.14%	8.14%	65.58%	13.92%	20.17%	7.168	34.5	.8	46%	11,203
Psychology	69.27%	19.8%	11.13%	83%	11.1%	6%	61.5%	26%	12.58%	16.70	47.2	1.2	66%	12,925
Philippine History	73.13%	15.8%	10.9%	74.71%	18%	7.43%	73.2%	14.42%	12.25%	14.01	43.6	1.4	60%	10,420
Philosophical Analysis Fundamental Techniques for Critical Thinking	84.8%	11.4%	3.73%	85.86%	12%	2.29%	71.92%	16.33%	11.75%	13.97	26.9	1	53%	15,158
English Language Express (Oral Diagnostic English)	81.73%	8.53%	9.8%	84.8%	10.5%	4.43%	74.08%	17.17%	8.75%	13.44	42.1	2.1	66%	3,437
Compilation of Lecture Exercises in Contemporary Mathematics	71.33%	22.2%	6.27%	80.4%	13.5%	6.14%	73.33%	17.75%	9%	7.32	41.9	2.3	60%	2,869
Komunikasyon sa Akademikong Filipino	78.13%	11.3%	10.6%	77.2%	7.4%	15.2%	72.33%	16.75%	10.92%	12.30	48.2	1.7	73%	15,179

The table presented the average percentages of workbooks the first year students of the College of Education used in their general education subjects during first semester AY 2011-2012, together with the scores each workbook attained from the other methods used to assess their level of reading difficult.

The respondents clearly confirmed that the workbooks used during first semester in the general education subjects have logically-sequenced, well-presented and relevant content and learner-friendly language that made the learners easily grasp their lessons.

After conducting the steps in getting the fog index of each workbook with the use of **Gunning's Fog Index** or **Modified Gunning Fog Index**, it has been found out that most of the books got a score exceeding 12, which means they can't attain the understanding of wide audience. Only some could have a grasp of what the text conveys. The use of jargons or technical terms to these books should have made their fog index scores increase. However, Physics and Its Essentials and Compilation of Lecture Exercises in Contemporary Mathematics got scores less than 8. This means that it used texts that could easily be understood by the audience.

Meanwhile, using **Flesch Reading Ease**, Physics and Its Essentials, Psychology, Philippine History. English

Language Express (Oral Diagnostic English), Compilation of Lecture Exercises in Contemporary Mathematics and Komunikasyon sa Akademikong Filipino got scores ranging from 30-49 which means that these workbooks contain texts that are difficult for the learners to read. It also goes to say that these books could easily be understood by students between 8th and 9th graders and college graduates. Analyzing it further, we could say that college students are the ones intended to utilize these books. It only means that the level of reading difficulty of these books is just appropriate to the level of thinking of their users. On the other hand, Philosophical Analysis Fundamental Techniques for Critical Thinking got a score within 0-29 which considers the texts included in it as very confusing. And in this range, it is said that the texts included in it can be understood by college graduates. We can say that the result goes with the fact that this book has contents and topics that mostly the students find it hard to understand because it requires them to use their critical thinking skills.

With the result given by **Rowntrees's Complexity Quotient**, it appeared that none of the workbooks got a score exceeding 3. It only shows that none of them used texts that can be considered difficult.

On the other hand, with the use of **Cloze Test**, it has been found out that Psychology, Philippine History, English Language Express (Oral Diagnostic English), Compilation of

Lecture Exercises in Contemporary Mathematics and Komunikasyonsa Akademikong Filipino used texts that are satisfactory for comprehension since their scores are exactly or higher than 60%. While Physics and Its Essentials and

Philosophical Analysis Fundamental Techniques for Critical Thinking got scores ranging from 40 – 60% which indicates that the texts they have used promote partial comprehension from the learners.

Table II: Summary of the Second Semester Data

Second Semester AY 2011-2012

Title of the book	Content			Format			Language Used			Modified Fog Index	Flesch Reading Ease	Reading complexity	Cloze test	No. of words
	% Yes	% No	% NR	% Yes	% No	% NR	% Yes	% No	% NR					
Developmental Reading	79.7%	11.7%	8.7%	84.29%	10.71%	5%	76.7%	10.42%	12.5%	15.40	43.7	2.7	73%	14,607
A Journey To Life: A Textbook On Biological Science	74.53%	9.87%	15.53%	84.43%	7.14%	8.14%	65.9%	13.92%	19.83%	12.09	43.8	3	46%	11,388
Mathematics	67.13%	20%	13.2%	72.1%	14.4%	13.8%	74.7%	15.92%	9.5%	9.13	51.2	2.4	53%	3,626
Pagbasa at Pagsulat Tungo sa Pananaliksik	83.93%	9.8%	6.47%	81%	9%	10.4%	85.08%	8.08%	6.92%	13.03	40.2	1.2	80%	23,760
Communication Arts (English)	78.6%	7.13%	7.8%	84.29%	9.86%	6%	84.08%	8.3%	7.58%	15.60	43.8	2.2	66%	9,773
Politics and Governance of the Philippine Constitution	83.3%	10.7%	6%	87.86%	7.57%	4.57%	86.25%	5.42%	8.25%	14.29	44.4	2.5	60%	11,704

The table revealed that the workbooks used by the first year education students during second semester AY 2011-2012 in their general education subjects, as agreed by the respondents, contained logically-sequenced and well-presented content, as well as learner-friendly language that make it easy for the learners to read.

It also shows the result of the conducted survey using other methods such as **Gunning's Fog Index or Modified Gunning Fog Index, Flesch Reading Ease, Cloze Test and Rowntrees's Complexity Quotient** to assess the course materials' level of reading difficulty.

Using **Modified Gunning Fog Index**, all of the books got a score exceeding 3 which means not all of their readers could understand their contents except Mathematics which got a score below 12. It only confirmed that Mathematics has texts that a wide audience could understand.

With the results given by the **Flesch Reading Ease**, it has been found out that most of the books got scores ranging from 30-49, which means they are difficult. While, only Mathematics is considered fairly difficult since its score falls within 50-59. All of the books, as presented by the table, are just appropriate to the level of thinking of the students.

With the use of **Rowntree's Complexity Quotient**, none of the workbooks contains text that is considered difficult because none of them got a score exceeding 3.

Lastly, using **Cloze Test**, Developmental Reading, Pagbasa at PagsulatTungosaPananaliksik, Communication Arts (English), Politics and Governance of the Philippine Constitution got scores higher than 60%. And according to the range given, they are considered satisfactory for comprehension. While A Journey To Life: A Textbook On

Biological Science and Mathematics got scores ranging from 40 – 60% which means they promote partial comprehension to learners in reading the texts included in them.

It was revealed in the study that the respondents' evaluation of the workbooks in terms of their content resulted to an agree rating which indicate that the workbooks contained interesting but relevant topics that represent what the education students need to learn before having their major subjects. The respondents also confirmed that the workbooks contain format that make the students comfortable and help them enhance their reading ability. The respondents' evaluation of the workbooks in the language used resulted to an agree rating which revealed that the workbooks used learner-friendly, yet, there are some words and phrases used which, for the respondents, are worn out. Flesch Reading Ease and Modified Fog Index revealed that most of the workbooks promote high level of reading difficulty. The Cloze Test revealed that most of the workbooks are considered satisfactory for comprehension. The Rowntree's Complexity Quotient revealed that none of the workbooks is difficult to read.

4. Conclusions and Recommendations

4.1 Conclusions

Based from the findings of the study, the conclusions derived were the respondents agreed on the workbook in terms of content, format and the language used. And some of the workbooks used by the education students are found to be difficult. But these difficulties are appropriate to attain higher level of thinking for further molding of future teachers.

4.2 Recommendations

From the findings and the conclusions of the study, it is therefore recommended that faculty members should be aware of the course materials that they are using. An evaluation of the course materials is encouraged to know that they contain contents that are relevant to the subject being taught. And though the students and the faculty members seem to be satisfied in the quality of course materials that they have been using, still, some changes in these course materials should be made- revisions, reprinting, updating, etc. The faculty members should also conduct a survey or simply give the students the chance to evaluate the book and hear from them the problems they have encountered from it and what changes they would want to happen. A consultation to the institute heads on the selection of the workbook to be used by the faculty should be encouraged for the selection of the most appropriate book for the subject in order to maximize the optimum benefits of the students. A similar study is encouraged on a larger and broader scale to further prove the effectiveness of the workbook.

References

- [1] Gay, L.R. (1976). Educational Research. Ohio: Charles E. Merrill Publishing Co. p. 199
- [2] Lively, B., &Pressey, S. (1923). A Method for Measuring the "Vocabulary Burden" of textbooks. Educational Administration and Supervision, 99, 389 – 398. In Hiebert, E. H. (in press). Standards, Assessment and Text Difficulty.
- [3] Nisan-Nelson, P.D. (2001). Technology integration: a case of professional development. Journal of Technology and Teacher Education . 9(1), 83-103.
- [4] Clark, K.D. (2000). Urban middle school teachers' use of instructional technology. *Journal of Research on Computing in Education* . 33(2), 178-95.
- [5] Sullivan, J. (1999). Statewide online web-based training program to prepare New Jersey community college faculty for distance teaching. Doctoral Dissertation, Nova Southeastern University. UMI: 9950863.
- [6] Yildirim, S. (2000). Effects of an educational computing course on preservice and inservice teachers: a discussion and analysis of attitudes and use. *Journal of Research on Computing in Education*. 32(4), 479-495.
- [7] Rodrigo, M.M.. (2001). *Information Technology Usage in Metro Manila Public and Private Schools. Doctoral dissertation*. School of Computer and Information Sciences, Nova Southeastern University.
- [8] Bonifacio, A. (2010). Developing Information Communication Technology (ICT) Curriculum Standards for K-12 Schools in the Philippines.
- [9] Labe, C.C. (2001). Paper presented at the E Trends 2001, Quezon City, 6 January.
- [10] Tinio, V. (2002). *Survey of information and communication technology utilization in Philippine public high schools: preliminary findings*. Center of International Cooperation for Computerization Government of Japan, pp. 2-30.
- [11] Cajilig, N. (2009). Integration of information and communication technology in Mathematics teaching in Metro Manila public secondary schools. *Education Quarterly*, 67 (1), 79-91.
- [12] Milbrath, Y.L., & Kinzie, M.B. (2000). Computer technology training for prospective teachers: computer attitudes and perceived self-efficacy. *Journal of Technology and Teacher Education*. 8(4), 373-396.
- [13] Hugo, J.S. (2000). *A case study of teacher use of technology: the decision beyond the barriers of time, training, and adequate equipment*. Doctoral Dissertation, Mississippi State University. UMI: 9981216.
- [14] Atkins, N.E., & Vasu, E.S. (2000). Measuring knowledge of technology usage and stages of concern about computing: a study of middle school teachers. *Journal of Technology and Teacher Education*. 8(4), 279-302.