โครงร่างความถี่ของคำศัพท์ที่ใช้ในการวัดความยากของบทอ่าน
Lexical Frequency Profile as an Indicator of Text Difficulty

ภัทร์ธีรา เทียนเพิ่มพูล*
Patteera Thienpermpool
เจเรอมี่ วอร์ด**
Jeremy Ward

บทคัดย่อ

งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาความเที่ยงตรงเฉพาะหน้าและความเที่ยงตรงตามสภาพของโครงร่างความถี่ของคำศัพท์**ที่ใช้ในการวัดความยากของบทอ่านเชิงขยายความ กลุ่มตัวอย่างมี 2 กลุ่ม คือ** 1) นักศึกษาในระดับมหาวิทยาลัยในประเทศไทย 3 คน และอาจารย์ในมหาวิทยาลัย 3 คน ซึ่งให้ข้อมูลเกี่ยวกับความเที่ยงตรงเฉพาะหน้า และ 2) นักศึกษาในมหาวิทยาลัย 45 คน และอาจารย์ในมหาวิทยาลัย 5 คน ซึ่งให้ข้อมูลเกี่ยวกับความเที่ยงตรงตามสภาพ เครื่องมือที่ใช้ คือ คอมพิวเตอร์ซอฟต์แวร์ที่เรียกว่าเรนจ์ บทอ่านจำนวน 4 เรื่อง และแบบสอบถาม 2 ฉบับ วิเคราะห์ข้อมูลโดยใช้ ความถี่ สัมประสิทธิ์สหสัมพันธ์แบบเสปียร์แมน และสัมประสิทธิ์สหสัมพันธ์แบบเพียร์สัน ผลการวิจัยพบว่าผู้เข้าร่วมการหาความเที่ยงตรงเฉพาะหน้าจำนวนเพียง 2 จาก 6 คน (คิดเป็นร้อยละ 33.33) คิดว่า**โครงร่างความถี่ของคำศัพท์**น่าจะเป็นตัวชี้วัดของความยากของบทอ่านที่ดี แต่จากการศึกษาความเที่ยงตรงตามสภาพ พบว่ามีความเป็นไปได้ถึง 76% ที่**โครงร่างความถี่ของคำศัพท์มีความเที่ยงตรงตามสภาพเหมือนกับ**สูตรวัดความยากง่ายของเฟล็ช และมีความเป็นไปได้ถึง 98% ที่**โครงร่างความถี่ของคำศัพท์มีความเที่ยงตรง**ตามสภาพเช่นเดียวกับสูตรวัดความยากง่ายของเฟล็ช-คินเคิด

คำสำคัญ โครงร่างความถี่ของคำศัพท์ ความยากของบทอ่าน ความเที่ยงตรงเฉพาะหน้า ความเที่ยงตรงตามสภาพ

Abstract

This study aimed to investigate the face validity and concurrent validity of Lexical Frequency Profile (LFP) as an indicator of difficulty of expository texts. There were two groups of participants: 1) three Thai students and three Thai lecturers taking part in the investigation of face validity of LFP and 2) forty-five university students and five lecturers participating in the investigation of concurrent validity. The instruments were 1) computer software called RANGE, 2) four reading passages and 3) two questionnaires. The data were analyzed by frequency, Speaman's rho and Pearson *r*. The results revealed that only two out of six participants (33.33%)

* นักศึกษาปริญญาปรัชญาดุษฎีบัณฑิต สาขาวิชาภาษาอังกฤษ สำนักวิชาเทคโนโลยีสังคม มหาวิทยาลัยเทคโนโลยีสุรนารี
** อาจารย์ที่ปรึกษา ผู้ช่วยศาสตราจารย์ ดร. ภาควิชาสาขาวิชาภาษาอังกฤษ สำนักวิชาเทคโนโลยีสังคม มหาวิทยาลัยเทคโนโลยีสุรนารี

taking part in the investigation of face validity agreed that LFP looked good as an indicator of text difficulty. On the other hand, the investigation of concurrent validity showed that there was a 76 percent possibility that the extent that the use of LFP to indicate text difficulty was as concurrently valid as Flesch readability formula, and there was a 98 percent possibility that the indication of text difficulty by LFP was as concurrently valid as Flesch-Kincaid readability test.

Keywords: Lexical Frequency Profile (LFP), text difficulty, face validity, concurrent validity

Introduction

Reading is generally defined as "a process whereby one looks at and understands what has been written" (Williams: 1984: 3). Reading plays an important role in foreign language learning and teaching situations (Richards and Renandya: 2002). There are a number of reasons for this. Firstly, many students often have reading as one of their goals in learning the language because they want to be able to read for information, for pleasure, for their career, and for study purposes (ibid.). Secondly, it is stated that reading academic texts is considered one of the most important skills that ESL or EFL university students should master (Levine, Ferenz and Reves: 2000) because reading makes a contribution to other subjects. Thus, students who are capable readers are likely to succeed in these subjects and develop confidence in their own abilities. Lastly, some students can gain good linguistic models of the language (Richards and Renandya: 2002) and learn some new vocabulary when they read (Nation: 2001). With these reasons, reading is integrated in language classes and as normally seen in commercial English textbooks such as Lifelines (Hutchinson: 1997), New Hotline (Hutchinson: 1998), New Interchange Students Book 3 (Richards, Hull, and Proctor: 1998) and Passages Student Book 1 (Richards and Sandy: 2008), reading skills are always included.

When reading is taught in ESL or EFL classrooms, like other skills, teachers need to plan what and how they are going to teach before teaching and students are encouraged to practice the skill outside class. One of the processes of teaching and learning reading that is worth discussing is text selection. For teachers, the selection of texts is a professional process (International Reading Association, www: 1994). The teachers need to select texts that will be used in a language class very rigorously and carefully. It is important for them to use a reliable and objective way to match appropriate texts to students. Texts used for reading instruction ought to be ones that students can read well but have not mastered (Lazar: 2004). If a text is too difficult for the students, the students are likely to focus too much on figuring out unknown words in the text (Taberski: 2000). They tend to struggle, become frustrated, give up trying to tackle the text, and say, "I just didn't understand that" (O'Malley and Chamot: 1990). On the

other hand, if a text is too easy, the students will be bored because they do not learn anything from the texts. Hence, the difficulty levels of instructional texts, which are selected, should be appropriately matched to students' capabilities (Carrell: 1987) in order to promote learning.

For students, text selection is also part of their learning process. When the students have learned reading in class, they are normally encouraged to practice reading outside class in order to promote self-study. They may select a text and read it for pleasure, for specific information or for other purposes in order to practice their reading. When they select a text, they usually select one based on their interests. Some of them may look for an interesting book or text in a library, a self-assess learning centre, or a bookstore while others may surf the net in order to look for a text that interests them. Nevertheless, it is questionable whether the students can choose a text that they can comprehend. It is good if they can select a text that is suitable and comprehensible for them. However, some of them may select a text that is too difficult or too easy for them. If the text is too difficulty, the text will discourage the students (Higgins: 2009) and cause them to form bad attitudes towards reading and decide to give up sooner or later. On the other hand, if the students choose to read an easy or familiar text, they should be able to develop their reading rates or their reading fluency, learn some information from the text and increase their confidence in reading. Unfortunately, they will not learn much new vocabulary because they tend to be familiar with the vocabulary.

We have seen that text difficulty plays an important role in learning and teaching reading. One way to estimate text difficulty is to analyse Lexical Frequency Profile (LFP) - proportion of low and high frequency words in a text. Several researchers such as Astika (1993); Meara (1993); Laufer (1994); Laufer and Nation (1995); Goodfellow, Jones and Lamy. (2002); Muncie (2002); Meara (2005) make use of LFP in their studies. The uses of LFP in these studies can be categorised into two aspects: 1) to use LFP to evaluate words that learners would be exposed to and 2) to analyse LFP in order to evaluate words used in learners' written work.

Apart from evaluation of words, LFP is also used to evaluate the suitability of texts for learners at various levels (Cobb: 2006). This evaluation is based on the findings presented by Nation and Waring (1997). Nation and Waring, for example, look at the number of tokens or percentage of tokens from the first, the second and the third 1000 most frequent word families because it was found that readers who know 3000 word families covering 95% of most texts can comprehend unsimplified texts (Nation and Waring: 1997). In order to apply this notion to the indication of text difficulty, it is important to combine all of the tokens from the first, the second and the third 1000 most frequent word families and calculate the percentage. In order

to know how difficult the text is, it is vital to look at the percentage of tokens from the three frequency bands. The text with higher percentage of tokens tends to be easier. This approach of evaluating texts has been applied to a number of sources such as Valcourt and Wells (1999) which present evidence to show that the approach works well in practice (Meara: 2005).

The research on validity of LFP as a method of indicating text difficulty seems to be, unfortunately, rare. Hence, it is still questionable whether LFP really measures what it is intended to measure. Validity is investigated in this study because LFP is used as an indicator of text difficulty and it can be seen as a readability index. According to Fry (1977), a readability index is somehow like a reading test, except instead of testing students, it tests written materials. Two areas of validity of LFP that are worth studying are face validity and concurrent validity. The face validity is investigated in order to show the extent that LFP appears to indicate text difficulty and the concurrent validity is studied so as to see the extent to which LFP correlates with some other comparable measures of text difficulty.

Research Objectives

This study aimed to: 1) investigate face validity of LFP and 2) investigate concurrent validity of LFP. The study, then, intended to answer the question, “To what extent would LFP be valid as an indicator of text difficulty?”

Research Methodology

Participants

Two groups of participants were asked to take part in the study in order to investigate face and concurrent validity of LFP. These two groups were: 1) three Thai students and three Thai lecturers taking part in the investigation of face validity of LFP and 2) forty-five university students and five lecturers participating in the investigation of concurrent validity of LFP as an indicator of text difficulty.

The three students in the first group of participants were third year students at a King Mongkhut’s University of North Bangkok. They were selected by purposive sampling method. They had different levels of language proficiency: intermediate, pre-intermediate and beginner. All of them had completed four fundamental English courses. They had also experienced text selection from the Internet and the library. They were named S1, S2 and S3 in the study. For the three lecturers, they had at least three years of teaching experience. They all got a PhD in a field relating to English language teaching. All of them had selected reading passages for their students in fundamental English courses. They were selected by purposive sampling method. They were named L1, L2 and L3.

For the second group of participants, forty-five university students at Kasetsart University, Kampangsan Campus took part in the investigation of concurrent validity. They were studying the fifth fundamental English course focusing on reading when the data were collected. They had a three-hour class per week. They were trained reading skills using an in-house material. They had studied four fundamental English courses at the university. Their English proficiency levels ranged from beginners to pre-intermediate. They were selected by purposive sampling method. They were named Student 1-Student 45. The five lecturers who were asked to take part in the investigation of concurrent validity of the vocabulary-based readability index had been responsible for English language teaching at their university for at least three years. All of them had experienced selecting texts for their students. They all got a PhD in a field relating to English language teaching. They were selected by purposive sampling method. They were called Teacher 1-Teacher 5 in the study.

Instruments

The data used in this study were obtained by using three main instruments: 1) RANGE, 2) four reading passages and 3) two questionnaires. Each of these instruments is presented below:

RANGE

RANGE is computer software developed by Nation and Heatley (computer software: 2002) of the Victoria University of Wellington. It was used in this study to analyze LFP by comparing an electronic text against vocabulary lists called baseword lists to see what words in the text are and are not in the lists and to see what percentage of the words in the text is covered by the lists (Nation, www: 2005). The program categorizes vocabulary in a text(s) based on word lists that has been set.

The word lists used in this study were from British National Corpus which is “one of the largest and most representative corpora of a single variety of English currently available” (Kennedy: 2003). There are fourteen 1000 word-family lists revised from Nation (2006). Each word list consists of 1000 most frequent word families. The first word list consists of the first 1000 most frequent word families while the fourteenth word list consists of the least frequent word families. The word lists were freely downloadable from http://www.victoria.ac.nz/lals/staff/paul-nation/nation.aspx.

The program checks the number of words in a text that match words in each of the word lists. For instance, in order to check how many words are from the first four word lists, namely, the first, the second, the third and the forth word lists, the program will categorize

words in the text into five categories: four of them are categories of word families from each list and off-list - a category of words that are not in the four lists. By way of illustration, let us look at LFP of one of the four reading passages, Passage One, derived from RANGE in Table 1 below.

Table 1 Lexical Frequency Profile of Passage One

WORD LIST	TOKENS/%	TYPES/%	FAMILIES
One	139/95.86	73/92.41	68
Two	6/4.14	6/7.59	6
Three	0/0.00	0/0.00	0
Four	0/0.00	0/0.00	0
Off-list	0/0.00	0/0.00	0
Total	145	79	74

From Table 1, we can see that both numbers and percentages of occurrences are given. The number before the slash (/) refers to numbers of occurrences in each word list and the number after the slash (/) refers to the percentage of occurrences. We can also see that the program presents the numbers and percentages of words in terms of tokens and types and word families in a target English text coming from each of the word lists and those which are not recognised in the lists or off-list words. The above figure shows that 139 tokens out of 145 tokens in Passage One are in word list one or the first frequency band consisting of the first 1000 most frequent word families and these 139 words make up 95.86% of the total tokens in the text.

A token or running word is any occurrence of a word form in the text, regardless of whether it is occurring for the first or the n^{th} time. A type is any word form which is counted only once, regardless of how many more times it might occur. A word family consists of a base word and all its derived and inflected forms (Bauer and Nation: 1993). Since the analysis of LFP in this study aims to show the percentage of running words in each passage covered by each word-family list, the word “token” is used as a counting unit in this study.

Reading Passages

There were 4 reading passages. The reading passages were controlled in terms of number of tokens and text type. They needed to be controlled in order to make sure that these two factors would not affect text difficulty. Additionally, according to Liu and Nation (1985) and Laufer (1989), readers who know 95% of tokens in a text can comprehend that text so LFP also needed to be controlled in order to be able to investigate whether LFP had any effect on reading comprehension. The characteristics of reading passages are shown in Table 2 below:

Table 2: Characteristics of Reading Passages

	Passage One	**Passage Two**	**Passage Three**	**Passage Four**
No. of tokens	142	150	144	142
Text type	Exposition	Exposition	Exposition	Exposition
Tokens/% in the first BNC word list	**136/95.95**	**127/84.77**	**122/84.17**	**112/78.87**
Tokens/% in the second BNC word list	6/4.05	**16/10.66**	**11/7.91**	**10/7.04**
Tokens/% in the third BNC word list	0/0.00	2/1.32	**6/4.32**	**5/3.52**
Tokens/% in the fourth BNC word list	0/0.00	0/0.00	0/0.00	**10/7.04**
Off-list	0/0.00	5/3.31	5/3.60	5/3.52

We can see from Table 2 that the number of tokens from each of the four reading passages ranged from 142-150 and the text type was exposition. In addition, Passage One has 95.86% of tokens from the first BNC word list; 95.40% of tokens in Passage Two are from the first two word lists (the first and the second 1000 most frequent word families); 96.92% of tokens in Passage Three are from the first three word lists (the first, the second and the third 1000 most frequent word families) and 96.45% of tokens from Passage Four are from the first four word lists (the first, the second, the third and the fourth 1000 most frequent word families).

Questionnaires

Two questionnaires were used in the study. One was used to investigate face validity and the other one was employed to investigate concurrent validity. In order to investigate the face validity, a questionnaire was used to survey the three university students' and the three lecturers'

opinions whether they agreed that the LFP looked good as an indicator of text difficulty The questionnaire consisted of three items and each item was a 5-point scale. The scale was valued 1 (extremely disagree); 2 (disagree); 3 (unsure); 4 (agree) and 5 (extremely agree). The other questionnaire was used to investigate the concurrent validity requiring 45 university students and 5 lectures to rank the four reading passages in terms of text difficulty from 1 (the easiest) to 4 (the most difficult). There was only one item in this questionnaire. Both questionnaires were written in Thai so it was easy for the participants to read and understand what they were asked to do.

Procedures

This section is divided into two parts, data collection and data analysis. Each of them is shown below:

Data Collection

Before the data for investigating face validity were collected, each of the three students and the three lecturers was informed the purposes of using LFP to indicate text difficulty and how to use it. They were then asked to complete the questionnaire for investigating face validity of LFP as an indicator of text difficulty. They were told to choose a number from 1 (extremely disagree) to 5 (extremely agree) on the scale that represented the extent that they agreed that the LFP looked good as an indicator of text difficulty.

For the investigation of the concurrent validity of LFP as an indicator of text difficulty, 45 students and 5 lecturers were told the purpose of the data collection. They were asked to read each of the four reading passages and rank them in terms of text difficulty without time limit. They were required to write number 1 (the easiest) to number 4 (the most difficult) in the questionnaire in order to rank the difficulty of the four reading passages.

Data Analysis

Frequency was used to show the number of the three students' and the three lecturers' responses on each item in the questionnaire for investigating face validity. The maximum was 3 and the minimum was 0.

Spearman's rank correlation or Spearman's rho was used to investigate the correlations of rankings of the reading passages in terms of text difficulty. The results were used to investigate the concurrent validity of the indication of text difficulty by LFP. In order to do so, Spearman's rho was used to compare the rankings of the reading passages ranked by LFP, the 45 university students and the 5 lecturers.

Pearson *r* was used to investigate the concurrent validity of the indication of text difficulty by LFP. In order to do so, the correlations between the percentage of tokens from the first three frequency bands which were the results of LFP and the results of two traditional readability formulas which are Flesch readability formula and Flesch-Kincaid readability test were investigated.

Results

Since two aspects of validity, face and concurrent validity were investigated, this section is divided into two sections. They are: 1) results of the investigation of face validity and 2) results of the investigation of concurrent validity.

Results of the investigation of face validity

The face validity was investigated in order to learn university lecturers' and students' opinions whether LFP appears to be a good measure of the level or degree of the ease or difficulty of texts for Thai university students to comprehend the texts. The results are presented below.

Table 3: Respondents' Opinion about the Face Validity of the Indication of Text Difficulty by LFP

Respondent	Extremely Disagree	Disagree	Unsure	Agree	Extremely Agree
L1				✓	
L2				✓	
L3			✓		

Table 3 (cont.): Respondents' Opinion about the Face Validity of the Indication of Text Difficulty by LFP

Respondent	Extremely Disagree	Disagree	Unsure	Agree	Extremely Agree
S1			✓		
S2			✓		
S3			✓		

Note: L stands for lecturer and S stands for student

From Table 3, two out of three of the teachers (L1 and L2) agreed that LFP looks good as an indicator of text difficulty. The other teacher and all of the students were not so sure that LFP can be used to indicate text difficulty.

Results of the investigation of concurrent validity

In order to investigate whether LFP can be used to indicate text difficulty, it is important to investigate the relationship between the results of LFP and: 1) rankings of text difficulty of four reading passages ranked by 45 university students in the questionnaire for investigating concurrent validity of LFP as an indicator of text difficulty; 2) five experienced lecturers' rankings of the four reading passages in terms of text difficulty in the questionnaire for investigating concurrent validity and 3) results or readability scores from Flesch readability formula and Flesch-Kincaid readability test. From these comparisons, two types of data which are ordinal and interval are involved. The students' and lecturers' rankings are ordinal. When the data are ordinal, Spearman's rho needs to be used to investigate the correlation. The results of Flesch readability formula ranging from 0-100 and Flesch-Kincaid readability test ranging from 0-12 are interval. When the data are interval, Pearson *r* needs to be used.

Both Spearman's rho and Pearson *r* are measures of correlations between two variables. They vary between -1 and +1. Any correlation near +1 indicates the very high level of agreement among the indicators of text difficulty while a correlation of -1 means that there is a perfect negative relationship between variables and a correlation of 0 means that there is no relationship between the two variables. The results of Spearman's Rho and Pearson *r* are presented in Table 4 and Table 5 respectively.

Table 4: Rank Correlations between Text Difficulty Indicated by LFP and Other Rankings of Text Difficulty

	Students' rankings	**Lecturers' rankings**
LFP	p = .822** p = 0.000	p = 0.840** p = 0.000

** Correlation is significant at the 0.01 level (two-tailed)

Table 4 shows that the ranking of difficulty indicated by LFP highly correlated with the rankings obtained from the participants' and lecturers' rankings ($p < 0.01$). The correlation coefficients were .822 and .840 respectively. These results were higher than Lunzer and Gardner (1979) who conduct readability research for the Schools Council Effective Use of Readability project. In their research, they investigated validity of eight formulas by studying the relationship between the results from these formulas with the teachers' judgments and that of Chall and Dale (1950) had the highest correlation (r = .77).

For the investigation of the relationship between the results of LFP which is the percentage of tokens from the first three frequency bands and results from Flesch readability formula and Flesch-Kincaid readability test, Pearson *r* was employed. The results are presented below.

Table 5: Pearson's Correlation Coefficients between the Percentage of Tokens from the First Three Frequency Bands (LFP) from the Four Reading Passages and Results of Two Readability Formulas

	Flesch Readability Formula	**Flesch-Kincaid Readability Test**
Percentage of Tokens from the First Three Frequency Bands	r = 0.873** p = 0.000	r = -0.992** p = 0.000

** Correlation is significant at the 0.01 level (two-tailed)

Flesch readability formula and Flesch-Kincaid readability test yield readability results in opposite directions. For Flesch readability formula, a high result or reading ease of a text indicates that the text is easy while the high American grade level presented as the result of Flesch-Kincaid readability test indicate that the text is difficult to read. Hence, the correlation coefficients gained from the correlation between the percentage of tokens from the first three frequency bands and the results of the two readability formulas, Flesch readability formula and Flesch-Kincaid readability test are undoubtedly opposite. The significant correlation between the percentage of tokens from the first frequency bands and the results of Flesch readability formula was positive and strong (r = 0.873, p < 0.01) because when the percentage of tokens from the first three frequency bands of a text is high, that text is indicated as easy to read. Similarly, the higher reading ease score, which is the results of Flesch readability formula, marks the text as easier to read. Conversely, there was a strong and negative correlation between the percentage of tokens from the first three frequency bands and the American grade level predicted by Flesch-Kincaid readability test (r = -0.992, p < 0.01). This is because the higher the predicted American grade level, the more difficult the text is while the higher the percentage of tokens, the easier the text is for readers. It can be concluded from the correlation coefficients from Table 5 that the extent to which the index correlates with the two traditional readability formulas was high and it is likely that LFP as an indicator of text difficulty has concurrent validity with the two readability formulas.

In order to investigate the possibility that LFP would be valid as an indicator of text difficulty, the correlation coefficients were converted to R-square by squaring the correlation coefficients or *r* values. The R-squares of the correlations between the percentage of tokens from the first three frequency bands which is the results of LFP and Flesch readability formula and Flesch-Kincaid readability test were 0.76 and 0.98 respectively. This means that there was a 76 percent possibility that the extent that the use of LFP to indicate text difficulty was as concurrently valid as Flesch readability formula and there was a 98 percent possibility that the indication of text difficulty by LFP was as concurrently valid as Flesch-Kincaid readability test.

Discussion

The investigation of face validity revealed that the lecturers and the students tended to have different ideas about what should be used to select appropriate texts. For the use of LFP, two of the teachers agreed that it appeared to be a good indicator of text difficulty because they tended to realize that proportion of low and high frequency words seems to have some effects on text difficulty (Nation, 2001). On the other hand, all of the students tended to believe that number of high frequency words did not mean anything to them because they thought that they did not have much vocabulary knowledge. Although words in a text frequently occur in everyday life, it does not mean that the words must be known to them.

Since LFP is a text-based variable, the analysis of LFP involves counting or calculating percentage of high frequency words in a passage in order to provide an index of probable difficulty for readers. It is a predictive device in the sense that no actual participation by readers is needed (Klare: 1974-1975).

According to the investigation of concurrent validity of LFP and an indicator of text difficulty, the correlation coefficients from Spearman's rho and Pearson *r* revealed that LFP indicates text difficulty in the same way as Flesch readability formula, Flesch-Kincaid readability test, lecturers as well as students. These similarities may be caused by some aspects of methodology that the analysis of LFP and the readability formulas have in common. When we look at how the analysis of LFP and the two readability formulas indicate text difficulty, there are two explicit similarities among them: 1) all of them use the counts of difficult words (Davey: 1988) and 2) the counting unit is tokens - any occurrence of a word form in the text, regardless of whether it is occurring for the 1^{st} or the n^{th} time (Bauer and Nation: 1993). These similarities might lead to the high correlation coefficients from Table 5.

REFERENCES

Astika, G. G. (1993). Analytical assessments of foreign students' writing. **RELC Journal** 24(1): 61-70.

Bauer, L. and Nation, I.S.P. (1993). Word families. **International Journal of Lexicography** 6(4): 253-279.

Carrell, P. (1984). The effects of rhetorical organization on ESL readers. **TESOL Quarterly**, 18(3): 441-469.

Chall, J. S. and Dale, E. (1950). Familiarity of selected health terms. **Educational Research Bulletin** 39: 197-206

Cobb, T. (2006). **Compleat lexical tutor**. [Online]. Retrieved September 14, 2007. from http:// www.lextutor.ca/.

Davey, B. (1988). Factors affecting the difficulty of reading comprehension items for successful and unsuccessful readers. **Journal of Experimental Education** 56(2): 67-76.

Fry, E. (1977). Fry's readability graph: Clarifications, validity, and extension to Level 17. **Journal of Reading** 21(3): 242-252.

Goodfellow, R., Jones, G. and Lamy M-N. (2002) Assessing learners' writing using Lexical Frequency. **ReCALL** 14(1). [Online]. Retrieved July 31, 2007. from http:// iet.open. ac.uk/pp/r.goodfellow/ReCall01(2).htm.

Higgins, L. G. (2009). **An evaluation of the relationship between criterion-referenced competency test reading comprehension and Lexile scores and Fountas and Pinnell's guided reading levels in a Georgia Public School District**. Unpublised EdD thesis, Liberty University.

Hutchinson, T. (1997). **Lifelines: Student's book intermediate level**. Oxford: Oxford University Press.

Hutchinson, T. (1998). **New hotline: Intermediate level**. Oxford: Oxford University Press.

International Reading Association. (1994). **Resolution on the selection of reading materials**. [Online]. Retrieved October 10, 2007. from http://www.reading.org/downloads/reso lutions/resolution97_selec tion_reading_materials.pdf.

Kennedy, G. (2003). Amplifier collocations in the British National Corpus: implications for English language teaching. **TESOL Quarterly** 37(3): 467-487.

Klare, G. R. (1974-1975). Assessing readability. **Reading Research Quarterly** 10(1): 62-102.

Laufer, B. (1989). What percentage of text-lexis is essential for comprehension?. In C. Lauren and M. Nordman (Eds.). **From humans thinking to thinking machines**. Clevedon: Multilingual Matters.

Laufer, B. (1994). The lexical profile of second language writing: Does it change over time? **RELC Journal** 25.2: 21-33.

Laufer, B. and Nation, I. S. P. (1995). Vocabulary size and use: Lexical richness in L2 written production. **Applied Linguistics** 16: 307-322.

Lazar, A. M. (2004). **Learning to be literacy teachers in urban schools: Stories of growth and change**. Newark: International Reading Association.

Levine, A., Ferenz, O. and Reves, T. (2000). EFL academic reading and modern technology: How can we turn our students into independent critical readers?. **Teaching English as a Second or Foreign Language Journal** 4(4). [Online}. Retrieved July 31, 2007. from http://www-writing.berkeley.edu/TESL-EJ/ej16/a1.html.

Liu, N. and Nation, I. S. P. (1985). Factors affecting guessing vocabulary in context. **RELC Journal** 16(1): 33-42.

Lunzer, E. and Gardner, K. (1979). **The effective use of reading**. London: Heinemann Educational Books for the Schools Council.

Meara, P. (1993). Tintin and the world service: A look at lexical environments. In **IATEFL: Annual Conference Report**, 32-37.

Meara, P. (2005). Lexical frequency profiles: A Monte Carlo analysis. **Applied Linguistics** 26.1: 32-47.

Muncie, J. (2002). Process writing and vocabulary development: Comparing lexical frequency profiles across drafts. **System** 30(2): 225-35.

Nation, I. S. P. (2001). **Learning vocabulary in another language**. Cambridge: Cambridge University Press.

Nation, I. S. P. (2006). How large a vocabulary is needed for reading and listening? **The Canadian Modern Language Review** 63(1): 59-82.

Nation, I. S. P. and Waring, R. (1997). Vocabulary size, text coverage and word lists. In N. Schmitt and M. McCarthy (Eds.). **Vocabulary: Description, acquisition and pedagogy**. New York: Cambridge University Press.

Nation, I. S. P. and Heatley, A. (2002). **Range: A program for the analysis of vocabulary in texts**. [Computer Software]. Retrieved September 14, 2007. from http://www.vuw.ac.nz/als/staff/paul-nation/nation.aspx.

O'Malley, J. M. and Chamot, A. U. (1990). **Learning Strategies in Second Language Acquisition**. Cambridge: Cambridge University Press.

Richards, J. C. and Sandy, C. (2008). Passages: Student Book 1. Cambridge: Cambridge University Press.

Richards, J. C. and Renandya, W. A. (2002). **Methodology in language teaching: An anthology of current practice**. Cambridge: Cambridge University Press.

Richards, J. C., Hull, J. and Proctor, S. (1998). **New interchange students book 3: English for international communication**. Cambridge: Cambridge University Press.

Taberski, S. (2000). **On solid ground: Strategies for teaching reading K-3**. Portsmouth: Heinemann.

Valcourt, G. and Wells, L. (1999). **Mastery: A university word list reader** MI: University of Michigan Press.

Williams, D. (1984). **Reading in the language classroom**. London: Macmillian.