

A diachronic Cross-disciplinary Study of Readability in Literature Review

Section of Research Articles

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Abstract

The purpose of this study is to investigate the comprehensibility of the text of the literature review section in research articles over the last 30 years. In other words, this study aims to investigate the trend of the change of LR text readability from 1988 to 2018. In this study, readability is defined as the level of difficulty of understanding a text based on the style of writing. This study follows previous studies to use the Flesch Reading Ease for measuring readability of the literature review section of research articles from 1988 to 2018. The literature review section of each selected research article was copied to a word file and their readability index of each was determined using the Flesch Reading Ease of the three distinct periods over the last 30 years. Results indicated an increase in the difficulty level of the text of the LR section over the last 30 years. Results also revealed a significant difference in the difficulty of the three distinct areas of research articles. Readability is generally considered one of the most important characteristics of effective writing. Yet little is known about the readability of the literature review section of academic articles in different journals. It is suggested that more research be conducted on the topic to shed more light on the stated gap.

Key words: Readability; research article; literature review section; disciplinary discourse

1. Introduction

Research articles should always be of high quality in order to produce knowledge that is applicable outside of the research setting. It is obvious that being easy to understand is a necessary feature of any text as it is true about the literature review of any research articles to shed light on the historical research way of the previous research. Nevertheless, some articles are likely to be more difficult to understand than others and may not be effective if the reader is unable to completely comprehend the contents.

Comprehension is a difficult concept to measure however as it requires not only the printed material but also a sample of the target audience (Stevens et al., 1992). In its place, researchers often use readability as a proxy. In other words, a document that is more readable should be easier to comprehend (Adelberg & Razek, 1984; Klare, 1984).

Many researchers commonly try to write in a good understandable way base on a journal scope to be sure about the acceptance of their articles. However, sometime the hardness of the long sentences, using of the passive form and the difficulty level of the words, makes the problem to get the exact point of their articles.

The importance of the text ease in all part of the research articles is unquestionable; especially the literature review part should be comprehensible for novice researchers. This study aims to find out the level of the text difficulty in literature review of research articles over the last 30 years from 1988 to 2018.

The findings of this study helps researchers to be aware of the important of the comprehensible of the literature review text to help to get the exact meaning of the text and the result of the previous articles in the way of their research.

Thus, this study is set out to find a plausible answer to this research question:

1. Is there any differences between the readability of the literature review section of research articles over the last 30 years?

In order to answer the research question, the research hypothesis is formulated as:

H0: There is no any difference between the difficulties of the literature review text of the three periods over the last 30 years.

In this study, literature review is an evaluative report of information found in the literature related to your selected area of study. The review should describe, summarize, evaluate and clarify this literature. It should give a theoretical base for the research and help you (the author) determine the nature of your research. Works, which are irrelevant, should be discarded and those, which are peripheral, should be looked at critically.

A literature review is more than the search for information, and goes beyond being a descriptive annotated bibliography. All works included in the review must be read, evaluated and analyzed. Relationships between the literatures must also be identified and articulated, in relation to your field of research.

In writing the literature review, the purpose is to convey to the reader what knowledge and ideas have been established on a topic, and what their strengths and weaknesses are. The literature review must be defined by a guiding concept (e.g. your research objective, the problem or issue you are discussing or your argumentative thesis). It is not just a descriptive list of the material available, or a set of summaries.

2.Literature review

Jones (1997) stated that readability refers to qualities of texts while understandability depends on the reader's background, prior knowledge, interest, and other factors. Nonetheless, there is substantial evidence that improving readability can be associated with reader comprehension, learning and retention, as well as reading speed and efficiency (Klare, 1984). Indeed, Flesch (1949) has shown that readable texts may be read in about half the time of less readable ones – with higher comprehension.

However, Armstrong (1980) finds support for the proposition that high prestige publications are expected to have low readability. Armstrong rewrote passages from articles in ten highly ranked management journals to be more readable and then asked groups of faculty participants to read different versions with varied levels of reading difficulty. The experiment's results indicate participants seemed to be more impressed with the less readable versions. Indeed, when the content of an article was poor, a lack of clear communication was especially helpful in obtaining a higher rating from the professors.

Hartley et al. (1988) found the same result with psychology articles. In a similar vein, Metoyer-Duran (1993) studied the readability of accepted and rejected papers of a library science journal and found that accepted papers had worse readability scores than did rejected papers. These finding supports the proposition that when an academic author writes more densely, the chance of his or her article being published increases. Consequently, scholarliness may get in the way of communication and so the effectiveness of the academic papers in

elucidating the results and implications of the research to other academics or practitioners may be compromised (McDonald, 2003).

The literature on readability is substantial and includes studies that apply readability measures to test how well the public understands certain documents used to disclose important information. Some examples include drug or medical informational literature (Mader & Playe, 1997), warranties (Moore & Shuptrine, 1993), and contracts (Scott & Suchan, 1987).

Other studies have examined how well industries respond to “plain English” dicta that require mutual fund prospectuses (Gutner, 1998; Johnson et al., 2002) and insurance contracts (Murray, 1998) to be readable. Some researchers have examined whether the readability of financial reports can be used to indicate companies’ financial performance (Abrahamson and Amir, 1996; Courtis, 1986; Fisher & Hu, 1989; Subramanian et al., 1993, among others).

Readability has also been used in advertising (Chebat et al., 2003) and websites (Leong et al., 2002). A related line of research has examined the readability of textbooks (Jones et al., 1993; Spiro et al., 1981; Shuptrine & Lichtenstein, 1985; Spinks & Wells, 1993; Mouli & Ramakrishna, 1991; Wiley et al., 1998; Adelberg & Razek, 1984; Flory et al., 1992; McConnell, 1982; Razek & Cone, 1981; Razek et al., 1982, among others).

Finally, a few studies have examined the readability of academic journals, for example (Loveland et al., 1973; Crosier, 2004; Bauerly et al., 2005, 2006). For an excellent summary of readability research, see DuBay (2004). Thus, this study intends to shed the light on the readability in literature review section of research articles.

3. Methodology

3.1 Corpus

In order to assess the readability of academic articles in TESOL Quarterly this study followed the approach in previous work and took the text of literature review from the introductions of articles in some issues of TESOL Quarterly along three time spans each includes 5 years. The first period is taken from 1988 to 1992 (Volume 22 to Volume 26), the second one from 2001 to 2005 (Volume 35 to Volume 39), and the third one is taken from 2014 to 2018 (Volume 47

to Volume 51) which resulted in 60 research articles including 20 papers at each period for the analysis.

3.2 Instrument

In this study, readability is defined as the “ease of understanding or comprehension based on the style of writing” (Klare, 1963). That is, we are not measuring the legibility of the print (typography) or the ease of reading due to the pleasantness of writing but the ease with which the reader can understand an article, read it at an optimal speed, and find it interesting, i.e. its comprehension.

It is usually assumed that a particular passage of text is easy to read if it has simple words and short sentences. Therefore, most readability tests concentrate on these two dimensions of the sampled text to estimate its readability, but differ in how they measure the average simplicity or difficulty of words within a sentence and how they measure the average length of the sentences. Hence, at present more than 200 readability formulas have been developed each with their own strengths and weakness; see Harrison (1980); Klare (1985) and DuBay (2004) among others.

This study follows previous studies and measure Flesch Reading Ease level of literature review text of 60 research articles. Nonetheless in all cases if the words and sentences are short, the resultant readability scores will be low, indicating that the document is easy to read; conversely, if the words and sentences are long, the readability score will be high, indicating that the document is difficult to read.

All these readability measures return a “grade level” based on the US education system. Since, US grade level 1 corresponds to age 6 in general adding 5 to the US grade level gives an estimate of the typical reader’s age. For example, if the sampled text showed an average grade level score of 8.2 this would indicate that the text is expected to be understandable by an average student in the 8th grade with an approximate age of 13-15. Grades 13-16 correspond to college level; grades higher than 16 correspond to graduate school level.

In addition, this study also calculated the Flesch reading ease (FRE) index as it is the most widely used, reliable and tested formula (Chall, 1958; Klare, 1963) and as some readability researchers consider it the most appropriate test for technical documents (DuBay, 2004).

The FRE score is computed using the average number of syllables per word as measure of word difficulty and average words per sentence to indicate of syntactic complexity. The FRE scores ranges from zero to 100, with 30 and below being “very difficult” and 70 and above being “easy,” see Table 1 which gives the full classification of readability and the estimated reading grade. Flesch (1949) himself set the minimum score for plain English at 60. However, readability measures are not without problems (Redish and Selzer, 1985).

For example, shorter sentences and words are not always clearer than longer ones, and readability does not measure the appropriateness or accuracy of the content. Furthermore, Stevens et al. (1992) in a wide-ranging critique of text based readability formulas (such as the Flesch and Fog indexes), conclude that: “Readability formulas do not consider the target audiences therefore they cannot be used to determine comprehensibility.” Despite these issues, readability formulas have received corroboration from cognitive psychology researchers. For example, Kintsch and Miller (1984) conclude that “these formulas are correlated with the conceptual properties of text” and so are the strongest predictors of reading speed and comprehension difficulties.

Table 1. Interpretation of Flesch’s reading eases scores

Flesch’s reading ease score	Style description	Estimated reading grade
0 to 30	Very difficult	College graduate
30 to 50	Difficult	13th to 16th grade
50 to 60	Fairly difficult	10th and 11th grade
60 to 70	Standard	8th and 9th grade
70 to 80	Fairly	7th grade
80 to 90	Easy	6th grade
90 o 100	Very easy	5th grade

4.Results

This study was an attempt to find out the readability of text of literature review section in research articles along last 30 years. For this purpose and in order to assess the readability of academic articles in TESOL Quarterly, this study followed the approach in previous work and took the text of literature review from the introductions of articles in some issues of TESOL Quarterly along three time spans each includes 5 years.

The first period is taken from 1988 to 1992 (Volume 22 to Volume 26), the second one from 2001 to 2005 (Volume 35 to Volume 39), and the third one is taken from 2014 to 2018 (Volume 47 to Volume 51) which resulted in 60 research articles including 20 papers at each period for the analysis.

To this aim the study, consider to using a suitable instrument as the Flesch Reading Ease, on all the 60 academic articles' literature review. Table 2 reports descriptive statistics for this result.

Table 2: Descriptive Statistics

	N	Range	Minimum	Maximum	Mean
Readability	20	30.10	11.70	41.80	25.2850
Group 1	20	22.30	8.90	31.20	19.5450
Group 2	20	16.70	10.60	27.30	19.9050
Group 3	20				

As mentioned before in this study there were three groups (Group 1, Group 2, and Group 3) of research articles, which there are 20 volumes in each group. In addition, in order to pay more attention to the result, the readability mean decreases along the last 30 years, but this amount does not have any tangible changing between group 2 and group 3.

Furthermore based on the results of the table above, the readability range of group 1 is 30.10, group 2 is 22.30, and group 3 is 16.70. , so there is a high difference between the readability ranges of these three groups along the period. More information does mention in Table 3.

It can be seen from the table 3, there was a significant difference in readability of these three groups which were from 1988 to 1992 (Volume 22 to Volume 26), from 2001 to 2005 (Volume 35 to Volume 39), and from 2014 to 2018 (Volume 47 to Volume 51).

Table 3: Results of Anova Analysis

Readability					
Between Groups	413.477	2	206.739	5.075	.009
Within Groups	2322.145	57	40.739		
Total	2735.622	59			

In other words, it can be claimed that the first group has easier LR section than the second and third group and there is a significant differences between the readability of these three groups.(P= .009)

Therefore, the null hypothesis of the study, which stated, “There is no any difference between the difficulties of the literature review text of the three periods over the last 30 years” can safely be rejected. Moreover, it can be said that there is a significant differences between the results of the three groups in readability or their difficulty of the text.

5. Discussion

As to the purpose of the study, the analysis of the data yielded a number of findings, which will be discussed in detail in this section, and their relevant implications will be drown. Having collected the data, the study followed the following statistical procedures to answer the research question to do, so the research question cited previously will be related results are mentioned. In the current study, the researcher tried to discover the comprehensibility of text of literature review section in research articles along last 30 years. In other words, this study was context to address the following research question:

1. Is there any differences between the readability of the literature review section of research articles over the last 30 years?

The purpose of the present study is to reveal the readability in literature review section in research articles, which is a diachronic cross-disciplinary study. The result will shed light on the following null hypothesis:

1. There is no any difference between the difficulties of the literature review text of the three periods over the last 30 years.

The research question addresses the point whether readability influence the comprehensibility of any text. Based on the results, a significant difference was observed on readability of the three groups and it can be stated that the research article writers had attempts to present their knowledge anyway and they did not exclude the readers in their ends.

As it was discussed in preceding part of the study, the mean readability of group 2 and group 3 were so near and the result is far about the group 1. Therefore, the writers try to find a way to make a balance between their content of mind and the readers' background knowledge.

However, they put emphasis on structure to write a good text instead of considering the discourse of their writing, and they focus of language instead of communication. Recently as the results show the text of literature review section are more specialized based on its discourse community to be comprehensible for special group, so they change to be more harder than before.

It seems that using disciplinary discourse cause the literature review section to be harder and more incomprehensible for general and belonging them to a special community. All this findings, confirm the significant effect of the readability on being more comprehensible of the literature review section of the research articles.

6. Conclusions and Implications

This study aimed at investigating to find out the readability of text of literature review section in research articles along last 30 years. To this end, this study chooses 60 research articles of TESOL Quarterly and put them in three groups, on three periods.

The first period is taken from 1988 to 1992 (Volume 22 to Volume 26), the second one from 2001 to 2005 (Volume 35 to Volume 39), and the third one is taken from 2014 to 2018 (Volume 47 to Volume 51). The study uses Flesch Reading Score as the instrument to measure the comprehensibility of literature review section of the research articles. After the readability, scores were obtained, the mean, the range, and the maximum & the minimum of the group scores were calculated. Then they were put in three groups, according to their exact place. After gathering the required data, in order to see any possible differences between these three groups of research articles, on three distinct period, the LR section of these research article compared

based on Flesch Reading Score, which is the instrument to measure the comprehensibility of literature review section of the research articles.

It is a fact that readability is defined as the “ease of understanding or comprehension based on the style of writing” (Klare, 1963). Indeed the purpose of research articles in different journals in the field of ELT is to enable one to understand a text of research article better and it is inevitably necessary for EAP, too.

As mentioned earlier, the comprehensibility changes of text of literature review section in research articles has been the main concern of the current study. Based on the results obtained, it was observed that the first group of literature review articles, which are taken from 1988 to 1991, show the higher readability mean and the higher readability range in comparative to the other two groups.

So this group is easier to understand for general people or may the literature review sections of this group has more short simple sentences than other groups to be more comprehensible, so increases of the readability has a significant effect on being more comprehensible.

This is consistent with the previous studies (e.g. studies which explained briefly in literature review of this study) indicating that in all ELT journals the emphasis is on being more comprehensible at all volumes.

Overall, the finding of the study showed that the research articles in first group were more readable but the second and third group readability scores were so similar together. It can be claim that readability changes through these three periods but it was almost unchangeable or has a little changing through period 2 and 3.

It seems important and necessary to be aware of how to write research articles literature review section based on a discourse community to be more understandable for a special group of community or based on a disciplinary discourse.

7. Suggestion for further studies

Since this study was narrowed down in terms of TESOL Quarterly journal with field of ELT. It seems necessary to point out some further research to be done in this regard:

1. Consider the fact that this study was limited to only 60 research articles, it is suggested that similar studies be conducted with more research articles.
2. More studies could be done to measure the readability of literature review section in another form of instrument to measure readability.
3. More studies are surely needed to find out the difficulty of text of literature review section of research articles.

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