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Lexical Complexity and Readibility Realized in The Introduction Sections of Selected English Journals

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Abstract

This study focused on the analysis of lexical complexity of the introduction section of the English journals manifested in lexical density, lexical diversity and lexical sophistication. This study also investigated the readability level of those texts. The method used in this study was a quantitative study by utilizing lexical complexity and readability analysis. The results of the study show that the manifestation of lexical density of the texts was above 0.50, representing that the content words utilized within the text were higher than function words. Furthermore, most of the introduction sections of the selected English journals achieved lexical diversity level more than 0.30 in which the highest lexical diversity was shown by EEJ journals and EduLite journals that shared the same level of lexical diversity with 0.35. Besides, the introduction sections were composed of. various advanced lexical items in terms of Academic Word Lists (AWL). Also, all introduction sections of the English journals - EEJ, EduLite and IJAL was readable for English department students both undergraduate and graduate degree based on Flesch Kincaid Reading Ease, Flesch Kincaid Grade Level and Miyazaki readability index. It is suggested that the journals' introduction sections should be composed of informationally dense lexical items covering the important ideas to strengthen the arguments. It is expected that further studies could investigate more about other aspects that determine the quality of English journals' introduction sections to uncover deeply about the quality of the texts.

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INTRODUCTION

Language can be expressed through the oral and written form for communication needs. Khalim and Warsono (2017, p.120) stated if "language is a tool for construing an experience to be a meaning" so that it can be communicated by people. According to Halliday (1985, p.62), "the distinction between written and spoken include the information presented." In written language, when people want to realize the important idea, they have to deal with the choosing of lexical devices. However, some writers sometimes do not know what should be included in the text because the compositions go down from the ideas, problems, and arguments.

In a written language form, there is lexical complexity needs as the component. It is a system of word choices that concerns lexical diversity/variability, density, lexical sophistication/rareness. This device has been widely used to evaluate the quality of second/foreign language learners' proficiency and considered as a valid and reliable device to measure academic writing product including cohesion, coherence, organization, and discourse (Bulte' & Housen, 2014; Mazgutoa & Kormos, 2015). Johansson (2008) stated that lexical density demonstrates the proportion of lexical items in a text while it has the different words in a text. Lexical diversity or lexical variation is defined as the number of different words in a speech or writing sample with a determined length. Lexical sophistication, also labelled as lexical rareness, is a relatively advanced or rare proportion of words in learners' writing (Read, 2000). Hence, those aspects are generally utilized as obligatory measures in academic text analysis as it comprises complex ideas.

According to Whitaker (2009) academic writing is essential writing that has to be done for university students which enables them to develop their skills in researching, evaluating information, organising, arguing, responding to others' arguments, analyzing, and expressing their idea clearly in writing. As mentioned by Creswell (2009), an academic writer, especially the students should firstly create a proposal as a

formal description of a plan to investigate the research problems which develop the framework and methodology to research to discover the result and answer the problems. Whitaker (2009) stated that in writing academic writing, they start by asking a good question, finding and analysing the answers about it, and determining the best answer(s) to discuss the result. Related to bringing ease for the readers about the research, Rosenwasser and Stephen (2012) suggest that selecting more precise words will make the writing clearer and sharpen the ideas. This assumes that when the student can utilize more precise words well, the meanings from the background of the study section will be arranged well, which also impress the readers with meaningful arguments.

The purpose of the introduction section is to give the readers the relevant facts about a topic to understand the material that the researcher is writing about and how it links to the research question. However, research has to mind the readability of the ideas provided. According to Pikulski (2002, p.1), "readability is the level of ease or difficulty with which text material can be understood by a particular reader who is reading that text for a specific purpose." Abonyi and Oluikpe (2013) in Eze (2015) mention that readability refers to assessing the difficulties that readers of a certain level of skills may have in reading a piece of connected written discourse or text. Generally, readability tends to give an overview of the effectiveness in communication between the writer of a written text and the reader. The well-arranged text has a high readability level in which the contents could be grasped by the readers without difficulties and enjoyed interestingly.

Based on those explanations between lexical complexity and readability, it is assumed that lexical complexity has an aligned relationship with readability. Lexical complexity refers to multidimensional characteristics of language use which shows us how informative the text is about and what is being communicated. On the other hand, readability is a measure of the accessibility of a text indicating how effectively it will reach the target readers.

Boudjella et al. (2017) state that readability refers to the ease with which a written text can be understood by a reader, which also depends on the vocabulary and syntax's complexity. Therefore, lexical complexity is one of the aspects that determines the readability of a text.

Based on the preliminary research, the text's lexical complexity in the introduction section has a unique appearance in terms of word choices. On the other hand, the introduction section's readability level has to achieve well acceptance from the intended readers. This has to be studied more to give strong evidence of how the lexical complexity is portrayed in the English academic journals. Therefore, the readability of the text was also assessed to analyse how readable the English journals are, particularly on the introduction sections with regard to the manifestation of lexical density, lexical variety, and lexical sophistication.

METHODS

The study's design was a descriptive quantitative study. It aims to investigate the lexical complexity and readability of the introduction sections in various English research journals from the interpretation of numbers and statistical analysis. The objects of the analysis were taken from English Education Journal (EEJ), Journal of English Education, Literature and Culture (EduLite), and Indonesian Journal of Applied Linguistics (IJAL) published by Indonesian Universities: Universitas Negeri Semarang, Universitas Islam Sultan Agung and Universitas Pendidikan Indonesia respectively. Moreover, it also investigated the quality of relationships, activities, situations, or materials (Fraenkel & Wallen, 2012). It was deemed that a descriptive quantitative design is suitable for this study due to its measurable data to build facts and uncover the data. The present study intended to analyze and explain the lexical complexity of the text manifested through lexical density, lexical diversity, and lexical sophistication analysis (Read, 2000). Besides, it investigated introduction sections' readability level. The lexical density, lexical complexity, and lexical

sophistication were approached utilizing Flesch Reading Ease Readability, Flesch-Kincaid Readability and Miyazaki Readability Index for EFL (Greenfield, 2004).

RESULTS AND DISCUSSION

This study examined the ways lexical complexity realized in the introduction sections of the English journals and its readability levels. This section described the findings of lexical complexity element; lexical density, lexical diversity, and lexical sophistication in the introduction section from selected English journals: EEJ, EduLite, and IJAL.

Lexical Complexity of English Journal Introduction Section

Read (2000) proposed that in measuring lexical complexity, there were three aspects to be analysed, they are lexical density which focuses in the lexical word portion in a text, lexical sophistication that concerns the use of advanced words in a text, and lexical diversity which involves the occurrence of various different lexical words utilized in a text. There were totally 30 journal articles and 10 taken from each journal.

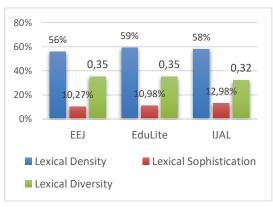


Figure 1. Lexical Complexity of English Journals

Figure 1 shows that all introduction sections of the English journals in terms of its lexical complexity. It shared a relatively similar level in terms of the lexical complexity with a little difference on its amount. In terms of the lexical density, the introduction sections of

EduLite journal possessed the highest level of lexical density with a percentage of 59% compared to others. Meanwhile, the highest average lexical diversity was possessed by introduction sections of EEJ and EduLite journals which shared the same amount of 0.35. However, in terms of lexical sophistication, the highest level was achieved by the introduction sections of IJAL journals with 12.98%.

Furthermore, the realization of lexical complexity which consists of lexical density, lexical sophistication and lexical diversity was determined its relationship by means of Correlation Analysis is on Table 1.

Table 1. Correlations of Lexical Complexity Elements

		Lexical	Lexical	Lexical
		Density	Diversity	Sophistication
L Den	Pearson	1	470**	.515**
	Correlation			
	Sig. (2-tailed)		.009	.004
	N	30	30	30
L Div	Pearson	470**	1	365*
	Correlation			
	Sig. (2-tailed)	.009		.047
	N	30	30	30
L	Pearson	.515**	365*	1
Soph	Correlation			
	Sig. (2-tailed)	.004	.047	
	N	30	30	30

^{**.} Correlation is significant at the 0.01 level (2-tailed).

Based on Table 1, the value of correlation between each element of lexical complexity was determined by means of Person correlation value and Significance (2-tailed) value. The result shows that the value of Sig. (2-tailed) between lexical density and lexical diversity of the English journals' introduction sections were 0.09 which was > 0.05. This value meant that there was no significant relationship between lexical density

and lexical diversity. In terms of Pearson correlation coefficient value, the relationship of lexical density and lexical diversity of the English journals' introduction sections achieved -0.470 which was < 0.349 that meant the relationship was said to be negatively correlated which also meant if lexical density value decreased, the lexical diversity increased with the same magnitude or vice versa. Meanwhile, the correlation between lexical density and lexical sophistication of introduction sections of the English journals got Sig. (2-tailed) value of 0.04 which was < 0.05. This condition meant that there was significant correlation between lexical density and lexical sophistication of introduction in the English journals. Regarding the Pearson correlation coefficient, the correlation value between lexical density and lexical sophistication of the introduction section of English journals achieved 0.515 which was > 0.349 that meant there was a perfect positive relationship between lexical density and lexical sophistication of the English journals' introduction sections in which when the lexical density was higher or lower, the lexical sophistication moved the same direction with the same magnitude. Furthermore, the correlation between lexical diversity and lexical sophistication of introduction sections of English journals achieved Sig. (2-tailed) value of 0.47 which was > 0.05. This value implied that there was no significant relationship between lexical diversity and lexical sophistication of the English journals' introduction sections. In regard to the Pearson correlation coefficient, the lexical diversity and lexical sophistication of the English journals' introduction section held value of -0.365 which was < 0.349. This value meant that the relationship between lexical diversity and lexical sophistication of English journals' introduction sections was said to be perfectly negatively correlated. If the lexical diversity value increases, the lexical sophistication will decrease with the same magnitude.

Readability of the English Journals' Introduction Sections

In regard to the readability of the English journals' introduction sections, it measures the

^{*.} Correlation is significant at the 0.05 level (2-tailed).

degree to which the introduction section texts are easy or difficult to read especially for EFL students. The introduction section texts from the selected English journals were inputted in the website for readability analysis which directly determines various types of readability score. However, this study only focused on the readability test in terms of *Flesch Kincaid Reading Ease* and *Flesch Kincaid Grade Level*. The outcome of the readability analysis is provided in Figure 2.

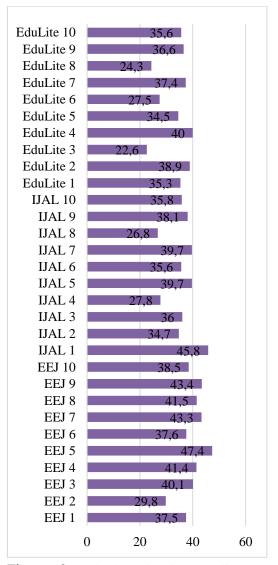


Figure 2. Flesch Kincaid Reading Ease Readability

As shown by Figure 2, the outcome of readability level of the selected English journals' introduction sections was presented in regard to *Flesch Kincaid Reading Ease*. In determining the

readability level from Flesch Kincaid Reading Ease, the result was categorized into some classifications which resulted in the estimated reading grade. Basically, the introduction sections of English journals are supposed to be addressed to college students in which the value of readability level is 30 - 50 that is categorized as difficult. In addition, the value of 0 - 30 belongs to college students and graduate students' reading materials which are categorized as very difficult. Based on Chart 2, it was shown that there were only six introduction sections of the journals that achieved the level of 0 - 30 for readability levels, such as Edulite No. 3, 6, and 8, IJAL No. 4 and 8; and EEJ No. 2 which were also categorized as very difficult texts. Based on the readability relevance table of the Flesch Reading Ease score with the education level of readers proposed by To et al. (2013), those who possessed 0 - 30 for readability level belonged to text that were supposed to be addressed to postgraduate readers. Meanwhile, the rest of other introduction section texts of the selected English journals possessed readability value between 30 - 50 which were regarded as difficult texts. Therefore, according to relevance of the Flesch Reading Ease score with the education level of the reader (To et al., 2013), the texts were classified as reading materials which were supposed to be addressed for undergraduate students.

Furthermore, the analysis of readability level of the selected English journals' introduction sections was also measured by Flesch Kincaid Grade Level to determine the texts were supposed to be readable at some level. The result of the analysis is provided in Figure 3.

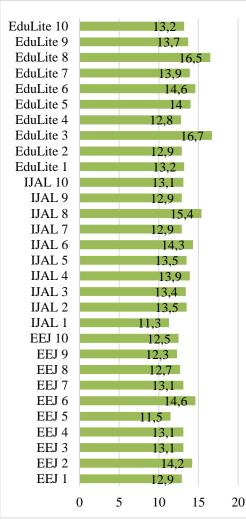


Figure 3. Flesch Kincaid Grade Level Readability

According to Figure 3, the result of readability calculation of English journals' introduction sections was done by the formula of Flesch Kincaid Grade Level. The outcome of the readability from Flesch Kincaid Grade Level represented the grade-school level. Chart 3 shows that there were only two introduction section texts exhibiting value of readability level below 12 which also indicated that those two texts were readable for the 12th grade students that came from EEJ No.5 and IJAL No.1. The rest of 28 English journals were categorized as readable because those English journals' introduction sections reached the readability score above 12 which were readable for college students and above.

To uncover the readability of the English journals' introduction sections for EFL students, the data were analysed in terms of words per sentence and letters per word. The Miyazaki EFL readability index look-up table was utilized to see how difficult the introduction section of English journals to be read. The result is provided in Table 2.

Table 2. Readability of English Journals in Miyazaki Readability Index

N	Jour	No of	Aver	Chara	Miyaza
0	nal	Sente	age	cters	ki
		nce	word	-	Readab
			s per	word	ility
			sente		
			nce		
1	EEJ	49	19.5	5.3	29
	1				
2	EEJ	54	23.3	5.4	19
	2				
3	EEJ	51	22.4	5.4	21
	3				
4	EEJ	48	22.6	5.4	21
_	4		01.0	5 0	0.7
5	EEJ	55	21.9	5.2	27
	5	40	20.7	5 4	10
6	EEJ 6	49	28.7	5.4	10
7	o EEJ	32	25.6	5.1	21
,	7	32	23.0	3.1	21
8	, EEJ	48	21.2	5.2	27
O	8	40	21.2	5.2	21
9	EEJ	58	20.7	5.3	27
	9	50	20.7	5.5	21
1	EEJ	70	19.5	5.2	31
0	10	, -			
1	IJA	149	39.2	5.1	<10
1	L 1				
1	IJA	126	23.3	5.5	18
2	L 2				
1	IJA	94	23.4	5.7	14
3	L 3				
1	IJA	83	27.4	5.9	<10
4	L 4				
1	IJA	52	22.4	5.8	<10
5	L 5				

1	IJA	64	28.1	5.4	10
6	L 6				
1	IJA	76	27.3	5.2	15
7	L 7				
1	IJA	47	30.4	5.7	<10
8	L 8				
1	IJA	129	31.1	5.3	<10
9	L 9				
2	IJA	77	20.6	5.4	25
0	L 10				
2	Edu	50	26.6	5.5	12
1	1				
2	Edu	25	21.6	5.3	21
2	2				
2	Edu	20	25.1	5.5	14
3	3				
2	Edu	53	20.7	5.3	27
4	4				
2	Edu	84	23	5.4	19
5	5				
2	Edu	69	20.1	5.7	20
6	6				
2	Edu	44	26.2	5.5	12
7	7				
2	Edu	80	27.5	5.7	<10
8	8				
2	Edu	98	22.5	5.4	21
9	9				
3	Edu	84	29.6	5.6	<10
0	10				

Based on Table 2, the readability result of the selected English journals' introduction sections was mostly categorized into difficult texts for EFL students. The result shows that there were twelve introduction sections which reached above 20 for Miyazaki readability index. Meanwhile, the most difficult introduction sections were possessed by seven journal articles, such as IJAL No.1, 4, 5, 8, 9; and EduLite No.8 and 10 that reached readability index below 10.

Lexical complexity is regarded as an indication of how a writer utilizes lexical items in composing a text. The purpose of this study was to investigate the realization of lexical complexity in the introduction section of English journals. The analysis covered the realization of lexical density, lexical sophistication and lexical

diversity. In addition, the readability of the English journals' introduction sections was also examined to uncover the difficulty level for EFL students in reading the text in terms of the lexical density, lexical sophistication and lexical diversity.

In analysing the lexical density, the comparison between the content words and total words utilized within the introduction section of English journals were measured. By utilizing Claws Tagger, the identification of content words and function words were clearly classified which then the lexical density was measured by dividing the number of content words with the total number of words in the introduction section text. It turned out that most of the English journals' introduction sections were composed lexically dense in which most of the lexical density level were above 0.50. There were only two introduction sections out of three journals that reached almost 0.50 for the lexical density level. This indicated that the number of content words (noun, adjective, adverb and verb) utilized within the selected English journals' introduction sections were more than function words. This also meant that the introduction sections were composed with much information addressed to the readers in terms of background of the research and literature reviews. As stated by Johansson (2008), a text with a high proportion of content words contains more information than a text with a high portion of function words. This also confirmed by Ginting (2012) that the higher lexical density of a text is, the more information offers and the more difficult it is to understand by the readers. Furthermore, the lexical density level also proved that the higher number of total words employed in writing the text did not significantly result in the higher lexical density of the text. This is in accordance with the study done by To et al. (2013) who also found that the higher level of a text did not necessarily guarantee higher lexical density index. Furthermore, the correlation analysis also indicated that there was a significant relationship between the total content words and lexical density rather than relationship between lexical density and total words in a text.

In terms of lexical sophistication, the focus of the analysis was how sophisticated the lexical items or advanced words employed in writing introduction section of English journals. The AWL (Academic Word List) which consists of 570 field of semantic utilized in academic texts was examined to uncover the percentage of lexical sophistication of the introduction section texts in which VocabProfiler online platform was utilized. The result of the study shows that most of the introduction sections of English journals exhibit lexical sophistication percentage more than 9%, even though there were few introduction sections which almost reached 9% of the lexical sophistication. These results indicate that most of the English journals' introduction sections was academically composed by the writers which also utilized advanced words. This is in line with the study conducted by Kirkness and Neill (2009) that journal articles were composed by a high variety of academic words. Therefore, the introduction section of English journal articles was written meticulously by college students and above with advanced lexical items (Nouri & Zerhouni, 2018; Purba, 2016; Bayazidi, Ansarin, & Mohammadnia, 2019). This was also highlighted by Lemmouh (2008) and Kalantari and Gholami (2017) that the use of advanced words and various lexical items exhibited strong correlation with the level of academic degree. Juanggo (2008) and To et al. (2013) also found that learners with more language proficiency, who produced better quality writing, generally utilized more advanced words in their written production and more diverse vocabulary.

In regard to analysing lexical diversity, this study at the same time was employing the online platform *VocabProfiler* in determining the wide variety of words used by the writers in composing the English journals' introduction sections. The focus of lexical diversity aspect was on type-token ration (TTR) as the index of lexical diversity of the text which was measured by dividing the different words by the total words in the texts. The analysis proved that most of the introduction sections texts were composed with lexical items that were repeated thrice. This was

represented by the value of TTR possessed by most of the introduction sections of the selected English journals with > 0.3. There were also few writers of introduction section of English journals who also got TTR value with more than 0.4 indicating that they used various words repeated 4 times. Likewise, some of the writers also achieved TTR value that was below 0.3 indicating that the lexical items used in composing introduction section texts were only repeated twice. Therefore, the more the TTR value possessed by a text, the higher the variety of words utilized in the text. This also seemed understandable since the writers of the introduction sections were university students from undergraduate and postgraduate which have already mastered in utilizing words to express their ideas. As stated by Morris and Cobb (2004) that TTR could be used to predict academic success in which higher TTR meant that the writers have maintained the extensive reading habit in the point where they have also internalized the cognitive functioning in understanding academic materials. Thus, a wide variety of words were expected to be utilized in writing with mature English academic style. Breze (2008) also argued that more advanced learners far better than beginning learners in terms of using various words and academic words. Furthermore, the correlation analysis also shows that there was a close relationship between different words and total words in the text in determining the lexical diversity.

With regard to the readability of the English journals' introduction sections, the analysis utilized the *Flesch Reading Ease* and *Flesch Kincaid Grade Level* in which those measurements were proved to possess accurate readability addressed to EFL learners. The results were then combined with the Miyazaki readability index to determine the readability level for the introduction section of the journals. It was found out that most of the introduction sections in the selected English journals was readable for college students and above which was represented by most of the readability index for Flesch Reading Ease with < 50 for the value. This was also confirmed with the result of readability result

from Flesch Reading Grade Level with >12 for the value in which most of the introduction sections were readable for college students and above. Furthermore, based on the Miyazaki readability index, all introduction sections from selected English journals reached below 30 which indicated that the texts were difficult for EFL readers. As stated by Greenfield (2004) that EFL readers have a higher tolerance for texts that were challenging than native readers do. Furthermore, Mavasoglu and Dincer (2013) highlighted that the more a text was lexically dense, the text would be difficult to be understood. Furthermore, the lexical diversity level of the introduction sections also reached the level of undergraduate and above readers in which they utilized a wide variety of words in the texts. In addition, the level of lexical sophistication also shows that advanced words were highly employed in writing the selected English journals (Nguyen, 2010; Francois & Bernhard, 2014; Gyasi, 2013). Greenfield (2004) stated that long words caused problems in accessibility to be understood. Therefore, the readability of the selected English journal articles' introduction sections was influenced by the level of lexical complexity in terms of lexical density, lexical diversity and lexical sophistication (Morales, 2019; Zamanian & Heydari, 2012; Abonyi & Oluikpe, 2013). This was also confirmed by Richards and Schmidt (2010) that the readability of a text was also influenced by the complexity of the lexical items.

CONCLUSIONS

The results of the current study show that the manifestation of lexical density of the English journals' introduction section texts was above 0.50 representing that the content words utilized within the text was higher than the function words. Most of the introduction sections achieved lexical diversity level more than 0.30 in which the highest lexical diversity was shown by *EEJ* journal and *EduLite* journal that shared the same level of lexical diversity with 0.35. Most of them achieved the percentage of lexical sophistication more than 9% which made most of the introduction section texts were written

academically in terms of AWL. Meanwhile, the readability of the texts achieved below 50 in terms of Miyazaki readability index in which all of them were difficult to read by common EFL readers who were not expert in English field.

It is suggested that the English journal writers compose the introduction sections of the journals with informationally dense covering the important ideas to strengthen the arguments. It is hoped that further studies could investigate more about other aspects that determine the quality of composing introduction sections of English journals to uncover deeply about the quality of the texts.

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