The Effects of Using Whiteboard Animation Application in Mastering English Vocabulary and Grammar

by John Pahamzah

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Abstract

This research aimed to reveal the effects of using whiteboard animation in order for the students to acquire English vocabulary and grammar.The respondent of the current research were two classes of eight grade students at Indonesian Junior high-school. In collecting the data, researchers used pre-test and post-test. The results were analysed using T-test. There was 58.9% improvement from the experimental group for the vocabulary. While for the control group, there is 37% improvement. For grammar test, the experimental group shows impressively significant difference with more than 100% improvement. While the control group shows 50.5% improvement in the grammar test. In conclusion, the researchers found that students who learn vocabulary and grammar through whiteboard animation show more significant improvement than the control group taught by conventional teaching method. The researchers also measured the effect size between vocabulary post test score with R

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squared of 0.321 and grammar post-test score with R squared of 0.485 from the experimental group.   So, the effects of the whiteboard animation on students' grammar are statistically significant and more impressive than on their vocabulary. Based on the results, whiteboard animation has significant effect towards both students' vocabulary and grammar with more improvement on grammar mastery though.

Keywords: Vocabulary, Grammar, Whiteboard animation, Learning media

Os efeitos do uso do aplicativo de animação do quadro branco para dominar o vocabulário e a gramática do inglês

Resumo

Esta pesquisa teve como objetivo revelar os efeitos do uso de animação em quadro branco para que os alunos adquirissem o vocabulário e a gramática do inglês. Os respondentes da pesquisa atual foram duas turmas de alunos de oito séries do ensino médio da Indonésia. Na coleta de dados, os pesquisadores utilizaram o pré-teste e o pós-teste. Os resultados foram analisados usando o teste t. Houve melhora de 58,9% do grupo experimental para o vocabulário. Já para o grupo de controle, houve uma melhora de 37%. Para o teste de gramática, o grupo experimental mostra uma diferença significativa e impressionante, com mais de 100% de melhoria. Enquanto o grupo controle apresenta melhora de 50,5% no teste de gramática. Em conclusão, os pesquisadores descobriram que os alunos que aprendem vocabulário e gramática por meio da animação do quadro branco apresentam melhorias mais significativas do que o grupo de controle ensinado pelo método de ensino convencional. Os pesquisadores também mediram o tamanho do efeito entre a pontuação do pós-teste de vocabulário com R ao quadrado de 0,321 e a pontuação do pós-teste de gramática com R ao quadrado de 0,485 do grupo experimental. Portanto, os efeitos da animação do quadro branco na gramática dos alunos são estatisticamente significativos e mais impressionantes do que em seu

vocabulário. Com base nos resultados, a animação do quadro branco tem um efeito significativo no vocabulário e na gramática dos alunos, com mais melhorias no domínio da gramática.

Palavras-chave: Vocabulário, Gramática, Animação do quadro branco, Meios de aprendizagem

Introduction

In recent years, there has been a rapid evolution of English-speaking communities, and individuals around the world, with unprecedented growth in the number of users and learners of English. According to the British Council's report on January 2020, English is currently spoken by 1.75 billion people worldwide, one out of every four people on the planet. People commonly speak English with different purposes such as to do business, in communicating with non-native English-speaking countries, for academic reasons, or simply to do work. Focusing on Indonesia, English has long been a particular subject at schools. There is a transformation in local academic curricula that today English starts to be taught since the first grade of primary school. Students are encouraged to be able to communicate in English, both in writing and orally. By the fact that the English subject is implied in the annual National Examination in Indonesia, learning English is compulsory.

As a foreign language learning, the value of vocabulary is so paramount that makes it a must to learn and teach. Harmer (2001, p.13) describes its importance stating that without grammar very little can be conveyed, without vocabulary nothing can be conveyed. More than that, vocabulary is an essential component of standards-based curriculum alignment. On the other side, most students hesitantly learn English since they feel like they don't have enough of a vocabulary to write or speak in the classroom. At the same time, students also prepare to work on National Examination at the end of their academic year at school. So, one of the key indicators of the students on that standardized test is their vocabulary.

To be more specific, the researchers focused on discussing the mastery of vocabulary and grammar by students. Through direct observation, the researchers have figured out that most of the students at Junior high school are below standard in passing English score. The researchers also found that students lack vocabulary and grammar mastery.

Teaching vocabulary and grammar is proved to be challenging. The lack of prior knowledge, misapplying the words, and inability to construct correct sentences grammatically are the students' common obstacles for studying English. Teachers need to take lots of time to repeat the same explanation so the students might understand the material being taught. Given this, the researchers have explored the development of whiteboard animation as innovative teaching and learning media to improve students' vocabulary and grammar.

In this kind of situation, the implementation of whiteboard animation as a teaching media might help the classroom to be more interesting for the students. Not only grabbing the students' attention but also inviting them to participate actively in classroom activities. According to the study conducted by Moreno and Mayer (2007, p.310), multimedia learning improves attention and motivation of the learner. Along with that statement, Sadiman, et al. (2008, p. 9) cited in Khalidiyah (2015) defined the use of audio-visual aids as animated video functions applied in conveying the message or the information in the study.

Whiteboard animation or known by other terms such as video scribing, sketch videos, explainer videos, and doodle videos is a technique for making multimedia through symbols or pictures that are on the whiteboard. The goal of whiteboard animation is to help viewers to draw concepts of what is explained through the videos. The animations create line drawings that can be considered as emotional design in multimedia instruction (Plass, Heidig, Hayward, Homer, & Um, 2014). Emotional design is a term used to describe visual design elements in multimedia learning environments that affect learners' emotions and foster learning. Vocabulary has been widely known as one of the key roles in acquiring a second language. According to Nation (2008: 7) cited in Pahamzah (2018), the most important group of

words is the high frequency words of the language. Vocabulary knowledge is also one of the best single predictors of reading comprehension. As explained by Richards (2002, p.255) vocabulary is the core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write a foreign language. More simply, Takac (2008, p.4) defined vocabulary as a set of words. Not too much different, Nunan (2003) stated that vocabulary is the entire set of words of a language. While deeper, Harmer (2001, p.16) summarizes that knowing a word (vocabulary) means knowing about meaning, word use, word formation, and word grammar.

There are different types of vocabulary based on how they are used contextually. Hiebert and Kamil (2005, p.3) stated that there are two types of vocabulary which are oral and print. Oral vocabulary is words that they recognize and know the meaning when they speak or listen. Print vocabulary is words that they recognize and know the meaning when they write or read. Moreover, Hiebert and Kamil (2005, p.3) explained that knowledge of words also come in two forms which are receptive and productive. Receptive vocabulary is a set of words for which individual can assign meanings when listening or reading. These are words that often less well known to a student and less frequent in use. Productive vocabulary is a set of words that individual can use when writing or speaking. They are words that are well known, familiar, and used frequently.

Grammar

Grammar is a system of meaningful structures and patterns that are governed by particular pragmatic constraints. Larsen-Freeman (2001) defined grammar as rules of a language. Along with that, Wersi (2013) referred grammar to the understanding of correct rules of English language by changing the form of words correctly and joining them into sentence. Brown (2007, p.420) also stated that grammar is the system of rules governing the conventional arrangement and relationship of words in a sentence. Further elaborated, Hornby (2005) defined grammar as the rules in a language for changing the form of words and joining them into sentence. More detail,

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Huddleston & Pullum (2005, p.6) described two grammatical subdivisions which are syntax and morphology. Syntax (grammar outside the word) deals with the structure and classification of phrases, clauses and sentences (Nuhiu, 2012:5). Morphology (grammar inside the word) deals with the internal structure of words and of the rules by which words are formed (Kabashi, 2000:12). In brief, grammar is the set of rules that describes how words and group of words can be arranged to form sentences in a particular language (Cowan, 2008:3).

Focusing on the rules, Crystal (2004) explained that grammar is the study of all the contrasts of meaning that it is possible to make within sentences. The 'rules' of grammar tell us how. By one count, there are some 3,500 such rules in English. People who have English as their mother tongue do not need to learn grammar, because unconsciously they learn the rules of the language as they learn their first language. Dykes (2007) stated that all people use grammar since they are able to speak. The generative grammar stored in the brain that allows a speaker to produce language that other speakers can understand is mental. However, for non-native speakers, like Indonesians, English grammar is essential to learn in order to be able to construct correct and meaningful sentences.

Teaching and Learning Media

Learning media is not something new in the academic world. Nowadays, teachers or tutors are encouraged to create more active teaching learning process through certain media. According to Syafrizal (2017) the use of e-learning as media to beyond what the experience in the real world, using lens techniques, camera angels and shots, music and film editing to ensure that viewers are not passive and stimulated by the power of video. Moreover, Heinich et al. (2002, p.9-10) state that media are all aids used by the teacher to deliver the material. Thus, Smaldino et al (2011, p.7) suggested that media format need to be in the physical form in which a message is incorporated and displayed. Media formats can be in the form of markers (visual and text), power point slides (text and visual), CD (sound and music), DVD (video), or computer multimedia (audio, text, and video).

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Using media in teaching learning process can make learning process more effective and interesting. Harmer (2001) stated that a range of objects, pictures, or animations can be used as instructional media to present and manipulate language and to involve students in teaching-learning activities. The more students active in the learning process the more knowledge the students gain. According to Brinton (2001, p.15), media have undoubtedly always facilitated the tasks of language learning both instructed and none instructed learners as a tool for language learning or teaching. In other words, media is an equipment or tool which can help the students to learn certain material easier. In this present study, the researchers will study about the implementation of whiteboard animation as a learning media and its effect on improving students' vocabulary and grammar. It will be applied to the material of degree of comparison.

Implementation of Whiteboard Animation as Teaching Learning Media

Whiteboard animations are an increasingly popular form of educational media. Although recent research in the development of whiteboard animations is rich, there is a lack of understanding of learner experiences with this type of animation.

Whiteboard animation is an engaging tool for teaching and learning, consisted of a series of hand-drawing illustrations with voice-over narration to explain complex and abstract ideas. Whiteboard animation is visualized dynamically in order to attract students' attention and gain their interests. Dynamic visualizations are more helpful than statics because learners can perceive moving elements in a direct way rather than having to mentally infer them via a mental animation process (Hegarty, Kriz, & Cate, 2003). Unfortunately, this situation is contrary from what happens nowadays in many classrooms from different grades. Teachers usually apply conventional teaching method in which students are not actively involved in the teaching-learning process.

The potential advantages of such presentation formats are numerous. First, dynamic visualizations are often attributed to be especially motivating and engaging for learners due to their cosmetic/aesthetic appearances, which may in turn lead to

better learning performances (Barak, Ashkar, & Dori, 2011). Second, they seem to be the most natural visual tool to convey dynamic properties such as translation and transformation (Lowe, 2004). Moreover, students will feel the teaching-learning process more joyful. When students enjoy the teaching learning process, it will ease them to learn more about the material given in the classroom.

Harmer (2006) stated that video can give essential extra benefits for students' learning experiences; enrich the students' experience about language in use, improve their cross-cultural understanding, develop their creativity, and increase their motivation in learning. However, in this advanced technology era, the teachers encounter some challenges in applying the video in the classrooms. The first challenge that the teachers have to face relates to their capability in deploying video in the classroom and utilizing other technology devices. Computer, laptop, projector, earphones, and some other programs or tools are commonly found in EFL classrooms. The teachers have to be the one who knows very well how to use the devices to assist the students during the teaching and learning process.

Research questions

This present study is concentrated on the crucial part of the material which is vocabulary, especially the adjectives. In comparing something or somebody, students are also required to construct the comparison with correct grammar. As whiteboard animation is applied as the experimental media, the students are expected to use the grammatically and contextually correct vocabulary they have learned. The following research questions guided the study:

- Is there any effect of using whiteboard animation in mastering students' vocabulary?

- Is there any effect of using whiteboard animation in mastering students' grammar?

- Is there any different effect of using whiteboard animation between vocabulary and grammar?

Methodology

This study employed true experimental design. The true experimental design was considered appropriate as this research was concerned to find out the effect of using whiteboard animation towards vocabulary and grammar mastery. Two classes were taken as sample classes such as: experimental group and control group. Pre-test was given to these groups to determine the capability of students. The experimental group was treated using whiteboard animation as a media of teaching while the control group was treated using web and blog. After that, the post-test was given to them to see the result of students' achievement. Here is the representation of the design:

The research used quantitative method since this research analyses data. According to Creswell (2009:145) quantitative method involves the process of collecting, analysing, interpreting the results of a study. Moreover, Muhartoyo (2007:11) states that Quantitative research is a deductive method. It begins with a hypothesis or theory then searches for evidence either to support or to refute that hypothesis or theory. The data collected for this type of research is called quantitative data i.e., data which are recorded in numerical form.

Sample / Participants

The population of this research was eight-grade students of junior high school. There were eight classes consisting of 240 students. According to Arikunto (2003 p,161), population is the whole subject of the research, while sample is a part of the investigated population (Arikunto 2003 p, 163). Two classes were taken for this study. The first class was the experimental group and the second one was the control group. Each class consists of 30 students.

Instrument(s)

Vocabulary Achievement Test: The test consisted of twenty-five vocabulary questions. The form of the vocabulary test was 'fill in the blank', synonym, antonym and picture identification. Vocabulary test questions were chosen in accordance with the grade level of the students. This test was developed by researchers. For the

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content validity, opinions were taken from 2 academicians from EFL education field. After necessary arrangements, it was applied to a different group at two-week intervals. The test-retest reliability coefficient of the test was found to be .83.

Grammar Test: The test consisted of twenty-five questions. The test was given in arranging random words and tenses. The test was developed by the researchers. To ensure that the test is suitable for the student grade level, the opinions of two experts on EFL education were presented on content validity. The Cronbach alpha coefficient obtained as a result of the application of the test at two-week intervals was determined as .87.

Data collection procedures

Post-test in the form of achievement test was employed as the instrument to collect the data in order to be able to answer the first and second research question. The test consisted of twenty-five vocabulary questions and twenty-five grammar questions. So, the total question in the achievement test was 50 questions. The form of the vocabulary test was 'fill in the blank', synonym, antonym and picture identification, while the grammar test was given in the form of arranging random words and tenses. Both experimental and control group took the test.

In scoring the test, the right answer is marked one (1) point and the wrong answer was marked zero (0) point, so the overall raw score from the right answers in this achievement test was 50 points.

Data analysis

In analyzing the data, researchers used Kolmogorov-smirnov's formula to analyze the normal distribution, and Levene's formula to analyze the variance of homogeneity. Then, the researchers analyzed the post-test score by using T-test to investigate the significance difference between experimental and control group' means in post-test. Moreover, to verify the influence of independent variable to the dependent variable and to know how well the treatment works, the calculation of effect size was performed. To determine the effect size, the researchers used independent variable upon dependent variable.

Results

The researchers put the result of vocabulary and grammar test from experimental group and control group.

Table 1 - Descriptive analysis of students' Pre-test and post-test score at experimental and control group

	Experimental Group				Control Group			
	Pre-test		Post-test		Pre-test		Post-test	
	$\bar{X}$	Sd	$\bar{X}$	Sd	$\bar{X}$	Sd	$\bar{X}$	Sd
Vocabulary skills	47.73	7.856	75.87	8.303	47.07	7.100	64.53	9.321
Grammar skills	35.47	7.628	74.80	11.610	36.40	8.997	54.80	9.227

This table indicates that there is different score and standard deviation in students' vocabulary and grammar test. The distribution score for experimental and control group in post-test shows the difference from the posttest. The data shows the difference of students' vocabulary (47.73 < 75.87) and grammar (35.47 < 74.8) in experimental group and also vocabulary (47.07<64.53) and grammar (36.4 < 54.8) in control group. It can be seen that there is an increase of students' vocabulary and grammar in the post-test.

There is 58.9% improvement from the experimental group for the vocabulary. While for the control group, there is 37% improvement. For grammar test, the experimental group shows impressively significant difference with more than 100% improvement. While the control group shows 50.5% improvement in the grammar test. So, the experimental group shows much better improvement than the control group. To confirm the results, the researchers then conducted a statically test to measure the effect size of whiteboard animation treatment to the experimental group.

As already described in the previous chapter, effect size is a statistical concept that measures the strength of the relationship between two variables on a numeric scale. In this study, the researchers calculate the effect size to measure how

large the effect of whiteboard animation to the improvement of participants' vocabulary and grammar was. By calculating the effect size, the researchers can find out the effect size of using whiteboard animation to be applied as teaching media in terms of improving students' vocabulary and grammar. From the Descriptive Statistics box, it can be seen that mean for control group is 64.53 and its standard deviation is 9.321. Then the experimental group's mean is 76.27 with standard deviation of 7.995. The total samples are 60 from both groups. Within the box, it can be seen that mean for control group is 54.8 and its standard deviation is 9.227. Then the experimental group's mean is 74.8 with standard deviation of 11.61. The total samples are 60 from both groups.

Table 2 - Vocabulary achievement test scores pre-post-test ANOVA results and effect size

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2065.067[a]	1	2065.067	27.387	.000	.321
Intercept	297369.600	1	297369.600	3943.774	.000	.986
Group	2065.067	1	2065.067	27.387	.000	.321
Error	4373.333	58	75.402			
Total	303808.000	50				
Corrected Total	6438.400	59				

a. R Squared= .321 (Adjusted R Squared= .309)

It was found that there is a significant difference between the pre-test and post-test vocabulary achievement scores of the students in the experimental group ($F_{(1-58)}$ = 27.38, p <.001). Post-test mean scores ($\bar{X}$ = 75.87) are higher than pre-test mean scores ($\bar{X}$ = 47.73). This finding shows that EFL teaching with the application of

whiteboard animation is effective in increasing students' vocabulary skills. Besides, as seen in Table 3, the R squared (Partial Eta Squared) is 0.309. Since the r value > 0.243 and < 3.71, hence this result is categorized as medium effect size.

Table 3 - Grammar skills test scores post-test ANOVA results and effect size

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	6000.000[a]	1	6000.000	54.566	.000	.485
Intercept	251942.400	1	251942.400	2291.247	.000	.975
Group	6000.000	1	6000.000	54.566	.000	.485
Error	6377.600	58	109.959			
Total	264320.000	60				
Corrected Total	12377.600	59				

a.R Squared= .485 (Adjusted R Squared= .476)

It was found that there is a significant difference between the pre-test and post-test vocabulary achievement scores of the students in the experimental group ($F_{(1-58)}$ = 54.56, p <.001). Post-test mean scores ($\bar{X}$ = 74.80) are higher than pre-test mean scores ($\bar{X}$ = 35.47). This finding shows that EFL teaching with the application of whiteboard animation is effective in increasing students' vocabulary skills. Besides as seen in Table 6. the R squared (Partial Eta Squared) is 0.485. Since the r value > 0.371 then this result is categorized as large effect size. The difference in the calculated result is statistically significant, the effect of the whiteboard animation on students' performance is also practically impressive. So, the difference between

control group and experimental group in performing grammar after whiteboard animation implemented to the experimental is large.

Discussion

To understand the importance of vocabulary and grammar in building sentences during learning English, the researchers started a study about the appropriate learning media that might enhance students' performance on vocabulary and grammar. As explained by Richards (2002, p.255) vocabulary is the core component of language proficiency and provides much of the basis for how well learners speak, listen, read, and write a foreign language. Meanwhile, Larsen-Freeman (2001) defined grammar as rules of a language. Grammar is a system of meaningful structures and patterns that are governed by particular pragmatic constraints.

The purpose of this research was to find out whether the whiteboard animation can improve the students' vocabulary and grammar. To find out the implementation of the whiteboard animation, the researchers employed pretest and post-test for all the research subjects. As the results in the previous section show, students from experimental group who was taught by whiteboard animation showed more significant result than the control group. It is along with the study of Harmer (2001) stating that a range of objects, pictures, or animations can be used as instructional media to present and manipulate language and to involve students in teaching-learning activities. The more students active in the learning process the more knowledge the students gain.

However, the students from control group also showed some improvement, even though not as significant as what the experimental group performed on the post-test. It proved that whiteboard animation as the learning media has improved the performance of experimental group on vocabulary and grammar better than the control group who did not get the same treatment. It has been highlighted by Brinton (2001, p.15), that media have undoubtedly always facilitated the tasks of language

learning both instructed and none instructed learners as a tool for language learning or teaching.

This study is the basis of an experimental study that simply uses a whiteboard animation application, sometimes it relies heavily on a smooth internet connection, while the main objective is to improve students 'English vocabulary and grammar skills so that students' grades can be fulfilled and adequate. However, in practice technical constraints can occur such as bad connections or unsupported networks. Another obstacle faced by researchers is that sometimes it is rather difficult to control the class or students at the time of learning. Sometimes it also occurs when the implementation of learning using this media cannot adjust the time appropriately so it is constrained by the number of students who attend the class.

There should be many things that should be used as development material to carry out the learning process of vocabulary and grammar through a whiteboard animation application, namely: (1) it is mandatory for teachers and students to master a little of simple technology so that learning activities can take place appropriately. (2) The teachers should always conduct an evaluation when the learning is finished (3) always create a warm learning atmosphere so that children or students can be directly involved in learning. (4) Able to use the Whiteboard Animation Application, so that students are able to feel interested and want to always use it effectively.

Based on the final results in this study, respondents in the experimental group showed a lot of improvement as evidenced by the pre-test results which were higher than the posttest results. This proves that treatment through animation has a very significant impact on increasing students' vocabulary skills, especially also improving grammar skills which are better than before. Some of the advantages of this animation media are that it provides opportunities for students to understand and see clearly the form of language, provides various learning resources such as the availability of sources or materials and learning styles to be used, for collaborative projects, as a multimodal practice tool such as visual, audio and written, and as a fun medium. Furthermore, this media is able to promote active and dynamic learners in terms of learning where students are not passive recipients of knowledge.

Conclusions

As explained in the findings section, both groups actually make some improvement on their understanding of vocabulary and grammar. However, statistically, it is proven that whiteboard animation helps participants to better understand the material provided by the teacher during the teaching-learning process. That means whiteboard animation that is conducted to experimental group works significantly in increasing students' vocabulary mastery. The effect size is categorized into medium effect size. According to the results of the research, it can be concluded that whiteboard animation can increase the students' grammar mastery. The data shows that there are differences on mean between control group and experimental group. Mean of the control group is 54.80, while the experimental group is 74.80. The effect size tells how big the difference is, the researchers find that the result of calculation shows that there is large effect size between control and experimental group on grammatical mastery after experimental group have whiteboard animation as their learning media. Based on the conclusion, there are some suggestions for teacher, students, and researchers.

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The Effects of Using Whiteboard Animation Application in Mastering English Vocabulary and Grammar

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FINAL GRADE

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GENERAL COMMENTS

Instructor