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Students' Vocabulary Enhancement in Grade V: A Comparative Study Using Total Physical Response Storytelling and Jigsaw IV

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Abstract

The purpose of this study was to see the enhancement of student's vocabulary learned through the Total Physical Response Storytelling (TPRS) & Jigsaw IV methods. This study sought to answer the following questions: (1) is there any significance difference in students' vocabulary mastery enhancement between those taught using TPRS and those taught using Jigsaw IV? (2) Which technique is better to use in teaching vocabulary to elementary students? This was a quantitative research experiment with a comparative design using a pre-test and a post-test. The participants of the study were 60 students of Grade V-B and V-C in Kartika X-3 Primary School, Parongpong, Bandung, West Java, Indonesia. They were randomly picked and divided into two intact groups. The students in Grade V-B learned through, TPRS while the students in Grade V-C learned through Jigsaw IV. After analyzing the data, the researchers found that there was a significant difference in vocabulary mastery between students who were taught using TPRS and those who were taught using the Jigsaw technique. Between these two techniques, Jigsaw IV was better in enhancing primary students' vocabulary.

Keywords: *Total Physical Response Storytelling, Jigsaw IV, vocabulary mastery.*

Introduction

In the past, a language has never been spoken more widely in the world than English is today (Melitz, 2016). English is the language that has spread most broadly throughout the world and is used in various fields including global trade, communication, and education (Crystal, 1997). Since learning English is essential, the Indonesian Government included English in the curriculum as one of the official subjects to be learned. It is taught from the elementary level (Katemba & Sitompul, 2018; Katemba, 2013, 2019).

In teaching English, especially at an early age, there are many things to be concerned about, one of which is vocabulary. Setiawan (2010) wrote that vocabulary mastery is comprehensive learning which embraces recognition, comprehension, and the production of words and meaning. Vocabulary manages words and meaning, while mastery implies comprehensive learning. Thornbury (2002) stated that more time spent on studying grammar would not give much improvement. "Without grammar very little can be conveyed, without vocabulary nothing can be conveyed" (Thornbury, 2002, p. 13). Improvement is seen in learning more words and expressions. Moreover, Hasan (2016) stated that in learning a foreign language, vocabulary is an indispensable concern because there is a tangible connection between the size of students' vocabulary and their performance of language skills.

Accordingly, the importance of vocabulary is a reason for teachers to give serious attention in teaching it, especially to children, because vocabulary is the foundation on which to build language and plays a fundamental role in communication. In short, vocabulary is the top priority in learning English (Hatch & Brown, 1995). Rusiana and Nuraengsih (2016) wrote that when teaching early age students, the lesson should emphasize vocabulary, since they are the very beginning step of learning the language. In other words, teaching English vocabulary should be introduced at the elementary level.

However, Cameron (2003) concluded that teaching vocabulary in elementary school is not easy; teaching vocabulary to young learners really needs extra efforts and strategies. Teachers should exert

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extra power to teach them since children have certain characteristics and need certain treatment. Alam (2009) identified some factors which cause difficulties in learning vocabulary for fifth graders. He confirmed that elementary school students usually have many problems in facing English such as they are too young to learn English, they still like to play with each other during class hours, and they lack interest in learning English. These reasons sometimes hinder fifth-grade students from learning English.

Literature Review

Vocabulary mastery is comprehensive learning which embraces recognition, comprehension, and the production of words and the meaning. Without vocabulary nothing can be conveyed (Hornby (1995), Setiawan (2010), Thornbury (2002). Vocabulary is an indispensable part of learning a language, especially English. Vocabulary must not be neglected by anyone who learns English (Anisa, 2016). Frequently, students instinctively recognize the importance of vocabulary in their language learning. If the students do not have enough vocabulary, they will have difficulty expressing their thoughts to others. In other words, vocabulary obviously plays an important role in speaking and listening skills, as well as writing and reading skills. If students want to read English books, they have to increase their vocabulary; in writing as well, vocabulary influences writing quality (Windasari, Rita, & Salehuddin, 2016; Zhai, 2016).

In order to develop a thorough understanding and deeper insight into previous works and trends about Total Physical Response Storytelling (TPRS) and Jigsaw IV, a review of related studies was done. It showed that according to teachers who were surveyed, both TPRS and Jigsaw IV improved students' motivation in learning.

TPRS increased interest levels and was useful in improving students' scores on both written and oral exams (Abu-Assab, 2015; Anisa, 2011; Powell & Wells, 2010). Similarly, a study conducted by Nurlaili et al. (2015) among first graders showed that TPRS was effective in teaching vocabulary, which was measured by enhancement of students' vocabulary comprehension. Studies of fourth graders by Rosaria (2014) and Dewi (2010) found that TPRS can improve vocabulary mastery, and it can also improve teacher skills during the teaching and learning process. TPRS gives significant influence to improve students' vocabulary mastery and even the grade four students who were taught by using TPRS achieved higher vocabulary mastery than grade four students who were taught by using translation only. Likewise, a study completed on high school students by Kariuki and Bush (2008) showed that TPRS appears to be a powerful tool to use in teaching foreign language students in improving their vocabulary mastery. The students taught using TPRS performed significantly higher than the students taught using the traditional method. So, TPRS is a powerful tool to use in teaching EFL students' vocabulary as proven from the previous studies. Another study on the cooperative learning using jigsaw4 shows that it is useful to enhance vocabulary.

Similarly, Azizinezhad et al. (2013) showed that classes using cooperative learning revealed increases in achievement, attitude, self-esteem, and social relationships. Besides cooperative learning, the Jigsaw Technique is an effective way to promote student participation and enthusiasm (Mengduo & Holliday, 2010). Moreover, the Jigsaw Technique affects the improvement of elementary students' vocabulary achievement (Rachmawati, 2012). In addition to studies in elementary schools, others were also conducted with junior high school students by Katranci et al. (2013) and Zuraida (2012). Students who were taught using the Jigsaw Technique improved their post-test scores. Further, Jigsaw IV was used at the undergraduate level, and the results showed that students who acquired Jigsaw IV increased their achievement levels. Students said that the subjects they learnt become easier, they permanently acquired knowledge, their self-confidence was enhanced, and the cooperation was enjoyable. Jigsaw IV is more effective than many conventional teaching methods (Maden, 2010).

Hence, the researchers decided to apply these two techniques in teaching vocabulary at an elementary school in Bandung, Indonesia: Total Physical Response Storytelling (TPRS), and Jigsaw IV.

Total Physical Response Storytelling

Total Physical Response Storytelling was an improvement derived from Total Physical Response (TPR), which was developed by James Asher, a professor of psychology at San Jose State University, California in the 1960s. TPRS was developed by Ray in the 1990s with the purpose of developing an efficient technique for teaching and learning language. TPRS combines Asher's TPR, allowing teachers to teach reading and writing along with vocabulary through story telling. Total Physical Response Storytelling is now more appropriately called "Teaching Proficiency through Reading and Storytelling", as stated by Nurlaili et al. (2015).

According to Gross (2007), TPRS consists of three important steps, namely: 1) establishing meaning, 2) storytelling, and 3) building literacy. However, these three steps could be accomplished in different ways according to the teacher. Ray (1997) stated that through storytelling, students' interest to listen to each part of the story and fully understand it will increase because students will pay attention to language structures and new vocabulary given in the story.

In her thesis, Simanjuntak (2015) wrote that TPRS begins by establishing the meaning of a word in the target language, and it can be done by giving the word's translation, showing a picture, or teaching words with gestures. The storytelling process plays an important role in this technique (Holleny, 2012), which emphasizes students' prior knowledge as the main point to establish meaningful teaching and learning progress.

Cantoni (1999) stated that in TPRS, the vocabulary teaching in the earlier stages will be learned by incorporating it into the stories that the learners hear, watch, act out, and retell. According to Decker (2008), TPRS begins with introducing the vocabulary; then students will act out the stories as the teacher tells (or asks), re-tells, and asks questions about the story.

The following are some steps to integrate total physical response storytelling in the classroom:

1. Establish meaning: The teacher presents new vocabulary words/phrases, along with the translation.
2. After teaching vocabulary, the teacher introduces the story. Student actors are called to the front of the class to act out each event as it occurs. The teacher strives to make the story elements "bizarre, exaggerated and personalized" by exaggerating details such as size, shape, time, quantity, and quality. As each new sentence is introduced, the teacher asks multiple questions in order to provide repeated exposure to the new vocabulary. Students are encouraged to react to new twists of the plot by making exclamations in the target language.
3. Students are given a printed version of the story they have just learned. One student at a time translates the story into English while the others follow along. The teacher discusses the reading by relating the story to students' lives, and asking if they have ever been in a similar situation.

Strengths of Using TPRS

Numpaque and Rojas (2010) stated that TPRS has numerous advantages that are rarely found in other techniques, such as:

1. Since the students can recall the words, they get enough exposure to the words so that they can use the words in context, and consequently speak the language.
2. Stories are simple and easy to remember. Learners may forget what they have been taught in class, but they will remember a story's events and the descriptive words used to narrate it.
3. TPR Storytelling develops fluency with accuracy. Learners acquire language in an amusing way that helps them to speak it without pressure; it is a low-stress way to acquire a foreign language.
4. TPR Storytelling is fun; humor makes learners laugh and promotes better long-term memory.
5. TPR Storytelling is also interesting. Since it is focused on learners' lives, it is more likely that they will be truly interested in the content and in expressing meaningful things in real-life situations.

Jigsaw IV

Jigsaw IV is part of the Jigsaw Technique, so they are generally the same. The differences between them can be seen in the procedures; Jigsaw technique is of a general nature, while Jigsaw IV gives a test at every step. Therefore, both Jigsaw IV and the Jigsaw Technique will be discussed in this section.

The Jigsaw Technique was introduced by Aronson et al. (1978) to improve peer cooperation, to help weaken racial cliques in forcibly integrated schools, and to create team solidarity among students through division of tasks that involved each student in a group to assume learning responsibility. The Jigsaw Technique encourages student participation in a setting where other pupils play a critical role in successful learning achievement, and this success depends on active cooperation and participation. Using the Jigsaw Technique increases the variety of learning experiences, and teaches learners course content and cooperative social skills (Perkins & Tagle, 2011).

Zuo (2011) stated that the Jigsaw Technique is a branch of Cooperative Learning that promotes effective learning by increasing motivation, interdependence, and social and linguistic communication skills. In a similar manner, according to Arlsan (2016), the Jigsaw Technique is a complex strategy in which interdependency is created. In other words, the Jigsaw Technique is a method of organizing classroom activity that makes students dependent on each other to succeed.

As each learner in a cooperative work group is responsible for a small part of the learning material and teaching it to other members, the sense of having a responsible role places each participant in the center of a knowledge creation process (Tran, 2016). Nappu and Angraeni (2017) stated that Jigsaw is a technique that makes students work together; it allows students to get to know each other, and helps them build good relationships as part of the learning process. Thus, they can feel good and enjoy studying. Students in Jigsaw Technique classes will be creative and will have good relationships with each other.

Jigsaw IV was developed by Holliday in the 1990s. In Jigsaw IV, students are typically assessed using review quizzes and other formal instruments created by the teacher (Holliday, 2000). With this technique, students work and think together through discussions with all members of the group. Students help each other in terms of the material to be mastered.

Teaching students in groups gives each student experience in studying together, sharing information within the group, so they will feel comfortable with group work. Therefore, the Jigsaw Technique gives students a good feeling about learning vocabulary because they study and help each other in mastering new words.

The following are some steps for integrating Jigsaw IV in the classroom:

1. Divide students into groups of 5–6 that are diverse in terms of language proficiency, with one person in charge as the leader.
2. Each student in a group is asked to look for the meaning of each word in different paragraphs.
3. Each group is given a short quiz to test their savvy.
4. Each student in every group that looked for meaning in the first paragraph will then be placed in a new group to discuss what they have found.
5. Students are given other quizzes to examine what they have learned from the whole discussion.
6. The whole lesson will be re-taught.

Strengths of Using Jigsaw IV

Collaborative learning has many advantages. It increases self-esteem and motivation among students, improves complex and cognitive thinking, creates positive feelings among students and about school, and makes responsible students. Most teachers have the same point of view (Jacobs et al., 2002).

The advantages of this technique are that (1) each child has a part in the group; (2) this makes students want to learn because they feel needed; (3) it allows each student to learn more; (4) it is efficient, encouraging students to listen to each other and have more social engagement; and (5) the time saved by not having to research by one's self makes this process a huge advantage (Adams, 2013).

So the researchers used the two techniques—TPRS and Jigsaw IV—in teaching vocabulary. In this study the following research questions were posed:

1. Is there any significance difference in students' vocabulary mastery enhancement between those who were taught through Total Physical Response Storytelling (TPRS), and those who were taught through Jigsaw IV?
2. Which amongst the techniques is better to use when elementary students are learning vocabulary?

Children easily get bored while learning and typically lose interest after 10 minutes (Harmer, 2001, 2007; Rachmawati, 2012). So their teachers should be seriously concerned about how lessons should be taught, and they must teach actively to avoid boredom. This kind of problem could be solved by teaching through Jigsaw IV, since Nappu and Angraeni (2017) stated that Jigsaw is a technique that encourages students to work with their peers. This means they can feel good and will enjoy studying together. In short, this way of learning might decrease their boredom.

However, children usually respond well to activities that focus on their lives and experiences. In short, children love to learn by doing. Learning by doing is also a part of TPR Storytelling. This engages students directly and focuses on reflection to increase knowledge, develop skills and also provide a suitable environment for language learning.

Therefore, in harmony with the reasons mentioned above, the researchers were challenged to conduct a comparative study to know which technique, TPRS or Jigsaw IV, is better at enhancing students' vocabulary mastery. The present study is different from previous studies where the researchers did not compare TPRS and Jigsaw IV.

Methodology

Research Design

This was a quantitative research experiment with a comparative design using a pre-test and a post-test (a non-equivalent, pre-test/post-test control design). This study compared the students' vocabulary mastery using TPRS and Jigsaw IV between the comparative intact groups. In the beginning, the two groups were given a pre-test to know respondents' abilities. After that, both groups were treated with different treatment for 66 hours, and at the end of the program, both groups were given a post-test to see whether their vocabulary mastery improved or not.

Table 1. Research Design

Group	Vocabulary Pre-Test	Treatment	Vocabulary Post-Test
Group 1	A	Total Physical Response Storytelling	A
Group 2	A	Jigsaw IV	A

Population and Sample

The population used for the research were students from the fifth-year elementary school who attended Sekolah Dasar Kartika X-3 Primary School in Parongpong, Bandung, West Java, Indonesia. The classrooms were randomly selected with a total of 60 students from two intact groups, grade VB and VC. Each group was composed of 30 students, and these served as the comparative groups. Their ages ranged from 10 to 11 years old. To see whether the two groups were comparable, several tests, such as a normality, homogeneity, and independent samples *t*-test, were performed on the pre-test scores. Please refer to Tables 3, 4, and 5 for the results. They showed that there was no significant difference on the pre-test scores for both groups; they were normally distributed and homogeneous.

Research Instrument

The instruments used in this study were a vocabulary mastery test that was used for the pre-test. The vocabulary mastery test was composed of multiple choice questions to reveal students' prior ability and vocabulary levels. For the materials during the treatment time, they were given school

textbooks and were treated using TPRS and Jigsaw IV as the methods. In the end of the program, students were given a post-test to find the results of their vocabulary mastery after being taught through both methods.

Data Gathering

To gather the data, the researchers implemented several procedures as follows:

1. Administering the Pilot Test. The pilot test was conducted before giving the pre-test. The test was a vocabulary test with a total number of 50 multiple choice questions. The vocabulary test was administered to 60 students who were from another group. The test scores were analyzed by a software package. The result of the computation of reliability test showed that the reliability was .93. It can be concluded that the test's reliability was high.

   Based on the results calculated, there were 49 questions that were valid. There was one question that was not valid, 1 question was very low, three questions were low, 43 questions were moderate, and one question was high. The results showed that there were 43 items that had raw scores ranging from .41 to .70. So, it can be concluded that the validity of the instrument was moderate.
2. Pre-test. Based on the recapitulation test done, this research study used 35 questions for the pre-test and post-test. It was based on the results of question analysis and discussion with the advisor; the 35 questions measured students' ability to improve their vocabulary mastery. The pre-test was given to both comparative groups to diagnose students' prior vocabulary ability before the treatments were applied. It consisted of multiple choice vocabulary questions that focused on nouns, adjectives, and verbs.
3. Post-test. A post-test was conducted at the end of the program to check the results after the two treatments TPRS and Jigsaw IV. The post-test, which contained the same questions as the pre-test but arranged differently, was administered to both comparative groups.

Procedure of Implementing TPRS and Jigsaw IV

After administering the pre-test, the treatments were given to both comparative groups. The procedures of teaching Total Physical Response Storytelling were adopted from Ray (1990), and the procedures of teaching Jigsaw IV were adapted from Holliday (2002). The same teacher taught both classes.

Table 2. Procedures Adopted for the Two Research Methods

TPRS Procedures	Jigsaw IV Procedures
Step One: Establish meaning. Teacher presents new vocabulary words or phrases, along with the target language translation. **Step Two:** After teaching the vocabulary, the teacher introduces the story. Student actors are called to the front of the class to act out each event as it occurs. The teacher strives to make the story elements "bizarre, exaggerated and personalized" by exaggerating details such as size, shape, time, quantity, and quality. As each new sentence is introduced, the teacher asks multiple questions to provide repeated exposure to the new vocabulary. Students are encouraged to react to new twists of the plot by making exclamations in the target language.	**Step One:** Introduction **Step Two:** Experts' sheets assigned to experts in the groups. Each Jigsaw group has an expert, who will later move to another group to share the topic in which they are a master/expert. After this, they will return to the home base group. **Step Three:** Groups answer expert questions prior to returning to home teams. **Step Four:** Quiz on material, with experts from groups checking accuracy.

Step Three: Finally, students are given a printed version of the story they have just learned. One student at a time translates the story into English while the others follow along. The teacher discusses the reading by relating the story to students' lives, and asking if they have ever been in a similar situation.	**Step Five:** Students return to home teams, sharing their information with teammates. **Step Six:** Quiz on material, shared checking for accuracy within groups. **Step Seven:** Review process for the whole group by playing Jeopardy, Quiz Bowl, etc. **Step Eight:** Individual assignments are graded. **Step Nine:** Re-teach any material missed on assessment as needed.

Research Findings and Discussion

The results of pre-test and post-test for each group were calculated using Microsoft Excel and SPSS 21. They can be seen in the following table:

Table 3. Pre-Test, Post-Test, and Normalized Gain Means and Standard Deviations

	TPRS		Jigsaw IV	
	Mean	St. Deviation	Mean	St. Deviation
Pre-test	54.33	11.88	56.63	11.00
Post-test	74.67	11.96	82.30	10.23
Normalized Gain	.464	.224	.597	.198

The results of the data shown in Table 3 suggest that there is a difference in the students' vocabulary mastery enhancement between those who were taught using TPRS and those who were taught with Jigsaw IV. It can be said that both methods are applicable, but the data suggest more favourable outcomes for the Jigsaw group. To comment further, the significance of the normalized gain figures is explained by Hake (1998) "as a rough measure of the effectiveness of a course in promoting conceptual understanding," and it has become a standard measure for reporting scores on research-based concept inventories. A normalized gain was used for this data because it measures strongly differentiated teaching methods, but allowed for "a consistent analysis over diverse student populations with widely varying initial knowledge states." Further, this allows instructors to compare their students' learning to that of other students at very different kinds of institutions (Hake 1998).

A normality test was also conducted to see whether the data obtained was normally distributed or not. The null hypothesis, H_o, would be rejected if the *p*-value was less than or equal to α (.05). The *p*-value for the Jigsaw IV group was .050 and for the TPRS group was .099, which means acceptance of the null hypothesis, meaning for both groups were normally distributed.

Likewise, a homogeneity test for the pre-test score was also completed. The computed results showed that the *p*-value was .919, which means that the population variances between those who were taught using TPRS and Jigsaw IV were homogeneous. Since the pre-test population was normally distributed and also homogeneous, an independent samples *t*-test was conducted subsequently.

From the results of the independent samples *t*-test, only the row for equal variances assumed was considered because the population variances were homogeneous. Since the *p*-value of the pre-test score was .440, which is greater than α (.05), it means that H_o was accepted. Since there was no significant difference between these groups, then the treatments could be carried out. At the end of the treatment period, a post-test was administered to the students. This data was tested for normality of distribution.

A normality test results are shown in Table 4. Based on this data, both tests were normally distributed. Since the gain score was normally distributed, a homogeneity test was conducted. The result of the homogeneity test returned a *p*-value of .832. Since the *p*-value is greater than α (.05), homogeneity was established.

Table 4. Normality Test of Gain Score

Group		Shapiro-Wilk		
		Statistic	*df*	Significance
Gain Scores	Jigsaw IV	.970	30	.540
	TPRS	.942	30	.102

Hypothesis Testing

Since the normalized gain population was normally distributed, then an independent samples *t*-test was done to answer the research question: "Is there any significant difference in the students' vocabulary mastery enhancement between those who were taught through TPRS and those who were taught through Jigsaw IV."

The criteria are:

1. If the p-value is lesser than or equal to α (.05), H_o is rejected. This means that there is significant difference in the students' vocabulary mastery enhancement between those who were taught using TPRS and those who were taught using Jigsaw IV.
2. If the *p*-value is greater than α (.05), H_o is not rejected. This means that there is no significant difference in the students' vocabulary mastery enhancement between those who were taught using TPRS and those who were taught using Jigsaw IV.

The calculation results can be seen in the table below.

Table 5. Results of Independent Sample *t*-test of Normalized Gain

	Levene's Test				
	F	Sig.	*t*	*df*	Sig. (2-tailed)
Equal variances assumed	.002	.965	2.439	58	.018
Equal variances not assumed			2.439	57.137	.018

Since the population variances of the normalized gain scores were homogenous, the row of equal variances assumed was used. The results obtained show that the *p*-value of the gain scores was .018, which is less than α (.05), so it is concluded that H_o must be rejected. Thus, there is a significant difference in the students' vocabulary mastery enhancement between those who were taught using TPRS and those who were taught using Jigsaw IV.

The study points to the superiority of the Jigsaw IV approach over that of TPR Storytelling. This is consistent with the study of Monson (2017) who showed that students working in a group project received higher scores than those who worked individually. In like manner, Grimm (2004, p. 27) found that group learning conditions yielded better grades than did individual learning conditions, and even the range of the mean scores was approximately 15% higher than the individual scores. He also wrote that "Students' weekly scores were found to be higher after a week of collaborative instruction. Students were able to retain and reiterate more accurate information after working in small groups with one another."

Conclusion

The researchers used TPRS and Jigsaw IV to see if these methods improve students' vocabulary mastery. It is believed that this is the first such study done in Indonesia. From these results obtained, it was evident that both groups showed improvement in their post-test scores after the respective

treatments. Based on the statistical results, it was concluded that there was a significant increase in the post-test scores.

Therefore, it was concluded that the null hypothesis must be rejected. Students who were taught using Jigsaw IV demonstrated higher vocabulary mastery achievement than those who were taught TPRS. So, it is concluded that Jigsaw IV was better than TPRS in enhancing vocabulary for these groups of primary students. In Jigsaw IV, students worked in groups and obtained higher results. This study's results showed that both groups' scores increased significantly, but Jigsaw IV led to a higher level of achievement.

Recommendations

Based on these findings, the researchers would like to make the following recommendations.

1. For teachers, these methods are recommended for use in teaching English, especially to elementary school students, because it has already been demonstrated that they help students' vocabulary mastery to increase.
2. For students, it is recommended to learn English vocabulary using the Jigsaw IV method because it enhances students' vocabulary mastery better than TPRS, although TPRS was also proven to increase vocabulary.
3. For future researchers, it is hoped that the results of this study can be used as a reference source for future studies in different levels and contexts.
4. For school curriculum design, to consider including these two techniques in the curriculum as one of the techniques to aid in vocabulary learning for foreign languages.

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