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THE EFFECTS OF MULTIMEDIA LEARNING AND VOCABULARY MASTERY ON STUDENTS' JAPANESE READING SKILLS

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ABSTRACT

The objective of this research was to determine the effects of multimedia learning and vocabulary mastery on students' Japanese Reading skills which used two-way treatment experiment design. This research was conducted at The Japanese Language Program, Faculty of Humanities – UNSOED with 48 students as the sample. The method used in this study was an experimental method with treatment by level 2 x 2 design. The formulation of this research was the effect of Rosetta Stone and Tell Me More Japanese multimedia learning against Japanese reading skill and the effect of vocabulary (high and low) to the Japanese reading skills. The results of this study are students' Japanese reading skills presented by "Rosetta Stone" is better than those presented by "Tell Me More Japanese". There are any effects of interaction among multimedia learning and vocabulary mastery on students' Japanese Reading skills. Besides that, students' Japanese Reading skills who have high-level vocabulary mastery and presented by "Rosetta Stone" is better than those presented by "Tell Me More Japanese". Then, students' Japanese Reading skills who have low-level vocabulary mastery and presented by "Tell Me More Japanese" is better than those presented by "Rosetta Stone".

Keywords: multimedia learning, vocabulary mastery, reading skills, Japanese students

INTRODUCTION

Reading skill is an integral part of the daily activity, which is important for people's academic, personal and social lives. Vocabulary mastery is an aspect that closely related to reading skill. According to Cohen & Johnson (2011), the relationship of reading skill and vocabulary mastery can even be significant prediction. It means that vocabulary mastery and vocabulary comprehension in a text are necessary items in comprehending the whole text. The rapid growth of computer technology gives some acceleration to the improvement of several kinds of texts especially on the increase of reading skill by the availability of language learning application called multimedia. One of the benefits of the multimedia can display text and picture at once.

The learning activity of Japanese reading subject *(Dokkai)* in S1 Japanese Study Program, Department of Humanities, Jenderal Soedirman University, still focuses on textbooks as the main guidelines in learning to read Japanese. From the result of observation of learning process the Japanese reading, it can be said that it emphasizes on the separating and leveling of language elements linearly from the easiest point to the most difficult one. Therefore, it is very important for the lecturers to have good knowledge in comprehending multimedia learning and have a good sense of choosing and using kinds of multimedia learning that is suitable for the various vocabularies mastery of the students.

Two types of multimedia learning on the market today are *Rosseta Stone* multimedia (hereinafter referred to as RS) and *Tell Me More Japanese* multimedia (hereinafter referred to as TMMJ). Both RS and TMMJ contain material or display of texts, images, illustrations, and sound. In brief, students are easier to get input in the form of various and abundant linguistic data through this multimedia. Although RS and TMMJ have diverse and abundant materials that can support more effective learning, its usage has not been applied in S1 Japanese Study Program, Department of Humanities of JenderalSudirman University. Finally, this study tries to reveal the influence of multimedia learning and vocabulary mastery on Japanese reading skills.

Based on the background, the researchers formulate the problem statements as follows; (1) Is there any differences of Japanese reading skills of students who follow the lecture using Rosetta Stone multimedia learning to those who follow the lecture using Tell Me More Japanese multimedia learning? (2) Is there any interactional influence

of multimedia learning and vocabulary mastery to Japanese reading skill? (3) Are there any differences in Japanese reading skill by the students who have high vocabulary mastery when they are using of *Rosette Stone* multimedia learning and *Tell Me More Japanese* multimedia learning? (4) Are there any differences in Japanese reading skill by the students who have low vocabulary mastery when they are using of *Rosette Stone* multimedia learning and *Tell Me More Japanese* multimedia learning?

According to Morreillon (2007), reading skill is a transaction between a reader, text and writer's intention. This statement is in accordance with Probst (2015) that reading is reciprocal, mutually defining the relationship. Reading skill is a complex process in which the reader has knowledge of integrated writing, writing system, phonology, semantics, and syntax. This is in line with the statement from Shihab (2011) that reading skill has an influence on the written and printed material that is useful in comprehending meaning which is going to be transferred by the writer through written vocabularies. Grabe (2010) stated that in fact, many reading skills (automatic word recognition, a large recognition vocabulary, skilled grammatical processing, and the formation of basic meaning proposition units for reading comprehension) only emerge as an outcome of implicit learning rather than explicit learning of aspects of language knowledge.

According to Okuyama (2007), Japanese alphabets consist of three types: Hiragana, Katakana, and Kanji. The first two are called syllabaries because each symbol is a syllabic unit while Kanji characters are ideographic symbols. Japanese children have to memorize the two syllabaries, with each set made of the basic 46 syllabic units and 61 extensions, before mastering over 2,000 Kanji characters to master all three sets of Japanese script.

Makino (2008) said that the purpose of reading skill in Japanese can be classified into five levels. Those levels are excellence, outstanding, advanced, intermediate, and beginner. This is in line with The Japan Foundation and Japan Educational Exchanges and Service which divided the purpose of Japanese reading skill into five levels. The highest level is the first, and the lowest level is the fifth.

According to Mayer (2014), multimedia is a way of presenting material or object in the form of texts (written and oral) and pictures (illustration, graph, diagram, map, picture as well as animation and video). Also, Malik & Agarwal (2012) state that Multimedia provides technology based on constructivist learning environment where students can solve a problem using self-explorations, collaboration, and active participation. Simulations, models, and media-rich study materials like those that still and animated graphics, video and audio integrated in a structured manner facilitate the learning ofnew knowledge much more effectively.

Basic theory in multimedia learning according to Mayer (2014) is a development of Paivio's Two Codes theory and Chandler & Sweller's Cognitive Load Theory. Two Codes Theory relates to information processing system in human's brain consisting of auditory or verbal tract and visual or image tract. Jong (2009) said that Cognitive Load Theory is a term proposed by Sweller. It is the basic idea of cognitive load theory that cognitive capacity in working memory is limited. So that, if a learning task requires too much capacity, learning will be hampered. Leutner, Leopold, & Sumfleth (2009) said that there are three types of cognitive competence, namely deep cognitive competence, surface cognitive competence, and germane cognitive competence.

In learning a language, there are several multimedia applications to help students to master it. In learning Japanese, *Rosetta Stone* Multimedia and *Tell Me More Japanese* Multimedia are some examples of this application.

Adams (2010) said in the interview that *Rosetta Stone* (RS) is language learning application program that enables students to develop their natural language fluencies by connecting new vocabulary to new meaning in a real context in the form of image/picture. It uses dynamic immersion method. This method is an expansion of immersion method, which is believed to be the implementation of two codes theory. While *Tell Me More Japanese* (TMMJ) is multimedia learning the application of language teaching that uses immersion learning (immersion method). This immersion method is trusted to be the implementation of cognitive competence theory, which limits visual and verbal information display to minimize the overloaded capacity in students' cognitive system. Immersion method requires an active interconnection between text and needed picture. The depth of an immersion relies on the display style and the type of character, especially from the reader.

The selection of illustrations in *Rosetta Stone* seems to be carefully done to make the balance between the knowledge obtained by the students and the needed result of the visualization itself. This carefulness can be seen from the use of four visual objects in every exercise in *Rosetta Stone* whereas in *Tell Me More Japanese*, there is only one visual object in every exercise of it. It is not the only weakness of *Tell Me More Japanese* compares to *Rosetta Stone*. The visual objects of Rosetta Stone have been equipped with at least three important characteristics of visualization process namely colors which give strong influence to image, realistic detail in illustration and relevance between visual object and text.

Vocabulary mastery according to Carrol, Crane, Duff, Hulme, & Snowling (2011) refers to the whole form and meaning which have been known and becomes the key component in reading skill. Al Qahtani (2015) has said that vocabulary knowledge (mastery) is often viewed as a critical tool for second language learners because a limited vocabulary in a second language impedes successful communication. Nation & Chung (2009) found that there are three aspects of vocabulary mastery namely the mastery of vocabulary form, the mastery of vocabulary meaning, and the mastery of vocabulary use. Schmitt (2007) said that there are eight criteria for students to get vocabulary mastery. These eight criteria are mastery on the vocabulary meaning, mastery of the vocabulary's written form, mastery of the vocabulary's oral form, mastery on the vocabulary's grammar behavior, mastery on the collocation (vocabulary's formation combination), mastery of language styles used in special situation (register), mastery on vocabulary association, mastery on vocabulary frequency. Based on these explanation, according to Al Qahtani (2015), the meaning of vocabulary mastery is the repertory of vocabulary owned by someone that can be used appropriately by the reading context.

Based on the theoretical review, the hypotheses of the research are as follows: (1) Japanese reading skills on students who use *Rosetta Stone* (A_1) multimedia learning are higher than those who use *Tell Me More Japanese* (A_2) multimedia learning. (2) There is an interaction influence of multimedia learning and vocabulary mastery on Japanese reading skill. (3) In students who have high vocabulary mastery, their Japanese reading skills will be higher if they use *Rosetta Stone (*A_1B_1) multimedia learning than those who use *Tell Me More Japanese* (A_2B_1) multimedia

learning. (4) In students who have low vocabulary mastery, their Japanese reading skills will be lower if they use *Rosetta Stone* (A_1B_2) multimedia learning than those who use *Tell Me More Japanese* (A_2B_2) multimedia learning.

METHODS

This research was conducted for the first semester of S1 students of Japanese Studies Program, Faculty of Humanities, Universitas Soedirman, Purwokerto, Central Java in the academic year 2011/2012. The method used in this study is an experimental method with treatment by level 2 x 2 design.

The samples vocabulary in class is divided into two equal groups, so that according to Emzir (2012), the easiest way is to divide them into two equal parts. The upper part is called the high group, and the lower part is called the low group. Emzir (2012) said that if the population size is approximately 100, the sampling data will be at least 50% of the population. Therefore, the composition of the sample is as follows: (1) The student group with high vocabulary learning *Rosetta Stone* multimedia consists of 12 students. (2) The student group with high vocabulary learning *Tell Me More Japanese* multimedia consists of 12 students. (3) The student group with low vocabulary learning *Rosetta Stone* multimedia consists of 12 students. (4) The student group with low vocabulary learning *Tell Me More Japanese* multimedia consists of 12 students.

The data collected in this study was obtained from a set of tests for each of the variables studied. The tests are vocabulary mastery test and Japanese reading skills test. The results of testing the validity of Japanese reading skill and vocabulary showed that the r count value of whole questions is bigger than the r table value which means that the entire item test of reading skills and vocabulary mastery test is valid. While the results of reading skills and Japanese vocabulary reliability testing using Alpha coefficient indicates that r count is bigger than r table. It means that either the test instrument of reading skills and vocabulary is feasible for use.

RESULTS AND DISCUSSIONS

Testing the hypothesis in this study is conducted with parametric statistical techniques that are useful in knowing the main effect. The main effects are: (1) the effect of *Rosetta Stone* (A1) and *Tell Me More Japanese* (A2) multimedia learning against Japanese reading skills. (2) The effect of vocabulary (high and low) to the Japanese reading skills. This technique also aims to examine the interaction effect of the combination treatment in the cells of the experimental design of Japanese reading skills.

The discussion of the research results based on the hypothesis proposed in this study is broadly divided into four discussions, namely: (1) the differences in *Rosetta Stone* and *Tell Me More Japanese* learning multimedia against Japanese reading skills. (2) The effect of interaction between multimedia learning and vocabulary of Japanese reading skills. (3) The difference in the high vocabulary for students who attend lectures with *Rosetta Stone* and *Tell Me More Japanese* multimedia learning against Japanese reading skills. (4) The difference in the low vocabulary for students who attend lectures with *Rosetta Stone* and *Tell Me More Japanese* multimedia learning against Japanese reading skills. The first hypothesis that states that *Rosetta Stone* multimedia learning is better than *Tell Me More Japanese* multimedia learning against Japanese reading skills, is significantly verified.

The mean value obtained by a group of students attending lecture using the *Rosetta Stone* multimedia learning is larger than the average value obtained by a group of students using *Tell Me More Japanese* multimedia learning (4,84>4.20).

Based on the results of ANAVA test and mean comparison test of the value of these two groups, it can be stated that Japanese reading skills learning would be better in the results if it is achieved through the process of learning using *Rosetta Stone* multimedia learning compared using *Tell Me More Japanese*. This is also supported by the reason that the characteristics of *Rosetta Stone* multimedia using Dynamic Immersion method. It teaches how to connect students with the vocabulary meanings shown through text, images, and sound. It also teaches how vocabulary is used in a different context with immersion method of *Tell Me More Japanese* multimedia which only teaches learners on how to remember vocabulary which tends to be monotonous as well as teaching language in textbooks.

The second hypothesis tests the effect of interaction between multimedia learning and vocabulary mastery against Japanese reading skills. The influence of multimedia learning conditions and vocabulary relies on a combination of treatments given, namely: (1) The high vocabulary mastery students tend to be more suitable for *Rosetta Stone* multimedia learning. This is supported by the mean value obtained by students who attend lectures with *Rosetta Stone* multimedia learning. The mean value is higher (x = 82.00) than the average value obtained by students who attend lectures with *Tell Me More Japanese* multimedia learning (X = 77.00). (2) While the low vocabulary mastery students, they tend to be more suited to *Tell Me More Japanese* multimedia learning.

This is supported by the fact that the low vocabulary mastery students have the highest value (x = 78.00) when they study using *Rosetta Stone* multimedia learning (x = 76.00). This effect is shown in Figure 1.

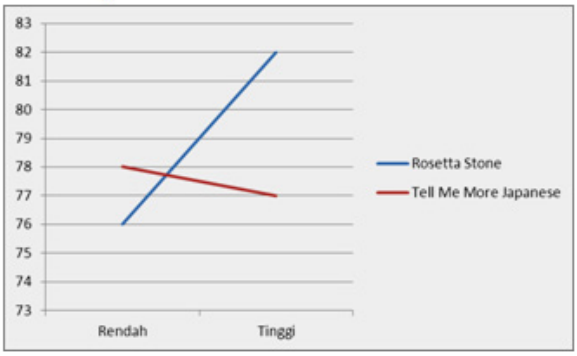

Figure 1 Effect Interaction between A1 and A2

After discovering that, there is an interaction between variables that proved significantly. The next step is conducting a difference test by calculating the difference between the mean value of reading skills group A1B1 and group A2B2. The calculations show that the value of Qcount = 9.09 ≥ Qtable= 5.50.

Therefore, a decision that can be taken is to accept H1. Thus, it can be concluded that there is a significant interaction effect between multimedia learning (*Rosetta Stone* and *Tell Me More Japanese*) and vocabulary mastery

(high and low) to the Japanese reading skills.

The third hypothesis which states that students who attend lectures with *Rosetta Stone* multimedia learning that has a high vocabulary mastery, is better than students who attend lectures with *Tell Me More Japanese* multimedia learning. And this hypothesis is verified very significantly. The average value of A1B1 is larger than the mean value of A2B1 (11,36>5.50).

It can be implied that the reading skills of Japanese students who attend lectures with *Rosetta Stone* multimedia learning with high vocabulary mastery are better than those who attend lectures with *Tell Me More Japanese* multimedia learning. From the results of ANAVA and mean comparison test of the value of these two groups, it can be stated that students who have high vocabulary mastery and learn Japanese reading skills would be better if they use *Rosetta Stone* multimedia learning than *Tell Me More Japanese* multimedia learning. Besides that, *Rosetta Stone* multimedia characteristics with Dynamic Immersion method is by the characteristics of high mastery. It is not just able to express or produce vocabulary but also can translate the vocabulary of the source language to target language.

The fourth hypothesis which states that the group of students attending *Tell Me More Japanese* multimedia learning and have low vocabulary mastery in Japanese reading skills is better than the group of students who take the classes with *Rosetta Stone* multimedia learning and have low vocabulary mastery is tested significantly. This tested hypothesis relates to the characteristics of *Tell Me More Japanese* multimedia learning, which is suited for low vocabulary mastery students.

From the results of ANAVA and mean comparison test of the value of these two groups, it can be stated that students who have low vocabulary, their Japanese reading skills learning would be better if they use *Tell Me More Japanese* multimedia learning compared to *Rosetta Stone* multimedia learning. It is also supported by the evidence that the average number of students with low vocabulary mastery attending classes with*Tell Me More Japanese* learning is higher than an average number of students who take the classes with *Rosetta Stone* learning.

CONCLUSIONS

Based on the results of the tested hypothesis, conclusions of this study are as follows: (1) Japanese reading skills to a group of students who uses *Rosetta Stone* multimedia learning is better than those who uses *Tell Me More Japanese* multimedia learning. (2) There is an interaction effect between multimedia learning and vocabulary mastery of Japanese reading skills. (3) In the group of students with high vocabulary mastery, the reading skill of Japanese students who use *Rosetta Stone* multimedia learning is better than those who use *Tell Me More Japanese* multimedia learning. (4) In the group of students with low vocabulary mastery, Japanese reading skill of students who use Tell Me More Japanese multimedia learning is better than those who use *Rosetta Stone* multimedia learning.

The Japanese reading skills can improve with performing it by using the *Rosetta Stone* multimedia learning for students with high vocabulary, and using *Tell Me More Japanese* multimedia learning for students with low vocabulary. While for students who are in between the high and low vocabulary, they can use combinations and variations of existing multimedia learning.

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Multimedia Learning

by Haryono Haryono

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METHODS

This research was conducted for the first semester of S1 students of Japanese Studies Program, Faculty of Humanities, Universitas Soedirman, Purwokerto, Central Java in the academic year 2011/2012. The method used in this study is an experimental method with treatment by level 2 x 2 design.

The samples vocabulary in class is divided into two equal groups, so that according to Emzir (2012), the easiest way is to divide them into two equal parts. The upper part is called the high group, and the lower part is called the low group. Emzir (2012) said that if the population size is approximately 100, the sampling data will be at least 50% of the population. Therefore, the composition of the sample is as follows: (1) The student group with high vocabulary learning *Rosetta Stone* multimedia consists of 12 students. (2) The student group with high vocabulary learning *Tell Me More Japanese* multimedia consists of 12 students. (3) The student group with low vocabulary learning *Rosetta Stone* multimedia consists of 12 students. (4) The student group with low vocabulary learning *Tell Me More Japanese* multimedia consists of 12 students.

The data collected in this study was obtained from a set of tests for each of the variables studied. The tests are vocabulary mastery test and Japanese reading skills test. The results of testing the validity of Japanese reading skill and vocabulary showed that the r count value of whole questions is bigger than the r table value which means that the entire item test of reading skills and vocabulary mastery test is valid. While the results of reading skills and Japanese vocabulary reliability testing using Alpha coefficient indicates that r count is bigger than r table. It means that either the test instrument of reading skills and vocabulary is feasible for use.

RESULTS AND DISCUSSIONS

Testing the hypothesis in this study is conducted with parametric statistical techniques that are useful in knowing the main effect. The main effects are: (1) the effect of *Rosetta Stone* (A1) and *Tell Me More Japanese* (A2) multimedia learning against Japanese reading skills. (2) The effect of vocabulary (high and low) to the Japanese reading skills. This technique also aims to examine the interaction effect of the combination treatment in the cells of the experimental design of Japanese reading skills.

The discussion of the research results based on the hypothesis proposed in this study is broadly divided into four discussions, namely: (1) the differences in *Rosetta Stone* and *Tell Me More Japanese* learning multimedia against Japanese reading skills. (2) The effect of interaction between multimedia learning and vocabulary of Japanese reading skills. (3) The difference in the high vocabulary for students who attend lectures with *Rosetta Stone* and *Tell Me More Japanese* multimedia learning against Japanese reading skills. (4) The difference in the low vocabulary for students who attend lectures with *Rosetta Stone* and *Tell Me More Japanese* multimedia learning against Japanese reading skills. The first hypothesis that states that *Rosetta Stone* multimedia learning is better than *Tell Me More Japanese* multimedia learning against Japanese reading skills, is significantly verified.

The mean value obtained by a group of students attending lecture using the *Rosetta Stone* multimedia learning is larger than the average value obtained by a group of students using *Tell Me More Japanese* multimedia learning (4,84>4.20).

Based on the results of ANAVA test and mean comparison test of the value of these two groups, it can be stated that Japanese reading skills learning would be better in the results if it is achieved through the process of learning using *Rosetta Stone* multimedia learning compared using *Tell Me More Japanese*. This is also supported by the reason that the characteristics of *Rosetta Stone* multimedia using Dynamic Immersion method. It teaches how to connect students with the vocabulary meanings shown through text, images, and sound. It also teaches how vocabulary is used in a different context with immersion method of *Tell Me More Japanese* multimedia which only teaches learners on how to remember vocabulary which tends to be monotonous as well as teaching language in textbooks.

The second hypothesis tests the effect of interaction between multimedia learning and vocabulary mastery against Japanese reading skills. The influence of multimedia learning conditions and vocabulary relies on a combination of treatments given, namely: (1) The high vocabulary mastery students tend to be more suitable for *Rosetta Stone* multimedia learning. This is supported by the mean value obtained by students who attend lectures with *Rosetta Stone* multimedia learning. The mean value is higher (x = 82.00) than the average value obtained by students who attend lectures with *Tell Me More Japanese* multimedia learning (X = 77.00). (2) While the low vocabulary mastery students, they tend to be more suited to *Tell Me More Japanese* multimedia learning.

This is supported by the fact that the low vocabulary mastery students have the highest value (x = 78.00) when they study using *Rosetta Stone* multimedia learning (x = 76.00). This effect is shown in Figure 1.

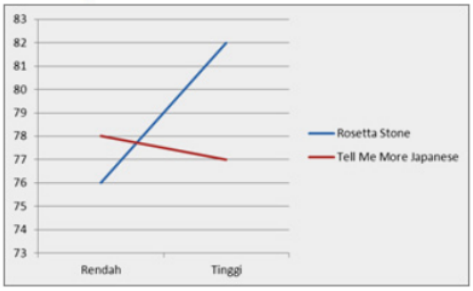

Figure 1 Effect Interaction between A1 and A2

After discovering that, there is an interaction between variables that proved significantly. The next step is conducting a difference test by calculating the difference between the mean value of reading skills group A1B1 and group A2B2. The calculations show that the value of Qcount = 9.09 ≥ Qtable= 5.50.

Therefore, a decision that can be taken is to accept H1. Thus, it can be concluded that there is a significant interaction effect between multimedia learning (*Rosetta Stone* and *Tell Me More Japanese*) and vocabulary mastery

(high and low) to the Japanese reading skills.

The third hypothesis which states that students who attend lectures with *Rosetta Stone* multimedia learning that has a high vocabulary mastery, is better than students who attend lectures with *Tell Me More Japanese* multimedia learning. And this hypothesis is verified very significantly. The average value of A1B1 is larger than the mean value of A2B1 (11,36>5.50).

It can be implied that the reading skills of Japanese students who attend lectures with *Rosetta Stone* multimedia learning with high vocabulary mastery are better than those who attend lectures with *Tell Me More Japanese* multimedia learning. From the results of ANAVA and mean comparison test of the value of these two groups, it can be stated that students who have high vocabulary mastery and learn Japanese reading skills would be better if they use *Rosetta Stone* multimedia learning than *Tell Me More Japanese* multimedia learning. Besides that, *Rosetta Stone* multimedia characteristics with Dynamic Immersion method is by the characteristics of high mastery. It is not just able to express or produce vocabulary but also can translate the vocabulary of the source language to target language.

The fourth hypothesis which states that the group of students attending *Tell Me More Japanese* multimedia learning and have low vocabulary mastery in Japanese reading skills is better than the group of students who take the classes with *Rosetta Stone* multimedia learning and have low vocabulary mastery is tested significantly. This tested hypothesis relates to the characteristics of *Tell Me More Japanese* multimedia learning, which is suited for low vocabulary mastery students.

From the results of ANAVA and mean comparison test of the value of these two groups, it can be stated that students who have low vocabulary, their Japanese reading skills learning would be better if they use *Tell Me More Japanese* multimedia learning compared to *Rosetta Stone* multimedia learning. It is also supported by the evidence that the average number of students with low vocabulary mastery attending classes with*Tell Me More Japanese* learning is higher than an average number of students who take the classes with *Rosetta Stone* learning.

CONCLUSIONS

Based on the results of the tested hypothesis, conclusions of this study are as follows: (1) Japanese reading skills to a group of students who uses *Rosetta Stone* multimedia learning is better than those who uses *Tell Me More Japanese* multimedia learning. (2) There is an interaction effect between multimedia learning and vocabulary mastery of Japanese reading skills. (3) In the group of students with high vocabulary mastery, the reading skill of Japanese students who use *Rosetta Stone* multimedia learning is better than those who use *Tell Me More Japanese* multimedia learning. (4) In the group of students with low vocabulary mastery, Japanese reading skill of students who use Tell Me More Japanese multimedia learning is better than those who use *Rosetta Stone* multimedia learning.

The Japanese reading skills can improve with performing it by using the *Rosetta Stone* multimedia learning for students with high vocabulary, and using *Tell Me More Japanese* multimedia learning for students with low vocabulary. While for students who are in between the high and low vocabulary, they can use combinations and variations of existing multimedia learning.

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