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The use of word wall media on student learning outcomes and motivation in cartesian coordinate

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Abstract
This research took place at the MTS Ibnu Hajar Bulupitu Gondanglegi Malang using word wall media to help students understand the cartesian coordinate material. This research aims to determine students' motivation and learning outcomes before and after using word wall media in cartesian coordinate material. The method used in this research is quantitative with the questionnaire method and pretest-posttest, where the questionnaire is used to measure student motivation. In contrast, the pretest-posttest is used to determine student learning outcomes. The study results show the percentage of student motivation before applying word wall media was 55%. In contrast, after the application of word wall media, which was 80%, there was an increase in motivation to learn as much as 25%. The normalized N-Gain results of 0.75, which are part of the high criteria, demonstrate that word wall media also effectively enhance student learning outcomes in learning cartesian coordinate material. This study concludes that using word wall media on Cartesian coordinate material can increase motivation and student learning outcomes.
Keywords: cartesian coordinate; word wall; motivation; learning outcomes

Abstrak
Penelitian ini berlangsung di lembaga MTS Ibnu Hajar Bulupitu Gondanglegi Malang, dengan menggunakan media word wall untuk membantu siswa dalam memahami materi koordinat kartesius. Tujuan dari penelitian ini ialah untuk mengetahui bagaimana motivasi belajar siswa dan hasil belajar siswa sebelum dan sesudah menggunakan media word wall dalam materi koordinat kartesius. Metode yang digunakan pada penelitian ini ialah kuantitatif dengan metode angket dan pretes-postes, yang mana angket digunakan untuk mengukur motivasi siswa sedangkan pretes-postes digunakan untuk mengetahui hasil belajar siswa. Hasil penelitian menunjukkan persentase motivasi siswa sebelum penerapan media word wall yakni 55% sedangkan setelah penerapan media word wall yakni 80% terjadi peningkatan motivasi belajar sebanyak 25%. Penggunaan media word wall ini juga efektif untuk meningkatkan hasil belajar siswa dalam pembelajar matematika materi koordinat kartesius dibuktikan dengan hasil normalisasi N-Gain 0,75 termasuk dalam kriteria tinggi. Kesimpulan dari penelitian ini bahea penggunaan media word wall pada materi koordinat kartesius dapat meningkatkan motivasi dan hasil belajar siswa.
Kata Kunci: koordinat kartesius; word wall; motivasi; hasil belajar

Introduction

Mathematics is one of the branches of science studied in schools (Puspaningtyas, 2019). Mathematics learning is very important for students, based on the objectives of mathematics learning in elementary to secondary education, namely to prepare students to always develop logically, rationally, critically, carefully, honestly, efficiently and effectively in the world of education (Masykur, et al., 2018). Mathematics is a basic science that is a benchmark for the development and progress of science and technology (Ulfa, 2019). According to Ruseffendi (2006) many students who after studying mathematics, are unable to understand even the simplest parts, many concepts are misunderstood so that mathematics is considered a difficult, complicated and difficult science. Moreover, in the Cartesian coordinate material, because students are required to be able to read the coordinate point location image correctly. To study the material on the coordinate system, students must first master the concept of units and measurements, the sequence of integers, and drawing number lines both horizontally (flat) and vertically (upright) (Khaeroni, 2018).

In general, teachers tend to use conventional methods, where teachers explain using a blackboard and a large ruler then draw the x and y coordinates on the board and often in the drawing process there are errors in the location of the coordinate points so that students find it difficult to understand. Mathematics learning like this seems boring and monotonous, therefore innovations in the learning process, both the methods applied and the learning media used, are always needed. Low interest and motivation in students will greatly affect student learning achievement, for this reason, teachers need to innovate in making learning media.

Based on the results of a survey in class VIII at MTS IBNU HAJAR Bulupitu, it was found that students' understanding of mathematics learning, especially in the Cartesian coordinate material, was still lacking. Most students were unable to solve problems related to Carter coordinates, students did not understand the lesson because the solution seemed monotonous and boring. This will have a negative impact on student performance because students tend to only listen which of course makes students sleepy and do not pay attention to the teacher. As a result, the average mathematics score does not reach the KKM and students' academic achievement is low.

Academic achievement is the level of achievement of a student in studying a subject at school which is expressed by the value obtained from the results of an accreditation test for a particular subject (Susanto, 2013). According to (Sugihartono, 2007), the factors that influence student learning outcomes are divided into two, namely internal factors and external factors. The internal factors referred to are those that come from within the student such as intelligence, interest and attention, learning motivation, tendencies, attitudes, learning habits, and others. in learning, as well as physical and health conditions.

While extrinsic factors are those that come from outside, including the quality of teaching and learning materials used by educators.

Based on the opinion above, it can be emphasized that an educator must be able to apply effective and efficient means to be used in the learning process. The role of media is very important in the learning process so that the material given by the teacher is quickly received and easily accepted by students (Wicaksono, 2016). Through the use of media, it is hoped that students will find it easier to accept or absorb (lesson content) delivered by the teacher. In addition, educators can also use learning materials related to technology to expand and deepen their own and students' knowledge.

Furthermore, the rapid development of science and technology facilitates the creation of application-based online learning materials. There are many applications available online, both prepaid and off-the-shelf, so that teachers can make optimal use of them. One possible online application used in creating learning materials is Wordwall. Wordwall is a media-based online learning application or tool that includes quiz features, word searches, games, and anagrams. This Wordwall application contains learning materials packaged in interactive questions on different topics at different levels, different topics and other content with a choice of material content created by the author himself educational implementation.

Facing existing problems, there needs to be a media innovation that can raise students' motivation to stay focused on learning and remain guaranteed, namely by using e-learning-based learning media. E-learning is an example of the use of information and communication technology that is appropriately used to facilitate a learning process. One type of e-learning is the Wordwall edugame. The Wordwall edugame is an interactive learning media, as expressed by (Maghfiroh, 2018) in his research, that the Wordwall edugame media is able to create interactions that are beneficial for students. Edugame qordwall (Prima Mutia Sari, 2021) is a website that can be used as a learning medium or an interesting assessment tool for students in learning mathematics.

Some of the advantages of edugame Wordwall are that it is free for basic options with a choice of several templates. In addition, the games that have been created can be sent directly via WhatsApp, Google Classroom, or others via a link. Edugame Wordwall offers many types of games such as crosswords, quizzes, random cards and many more. Another advantage is that the games that have been created can be printed in PDF format, so it will make it easier for students who have network problems.

Method

This study uses a quantitative research method with a pretrial design method in the form of a single group pretrial design study. In this study, only one experimental group carried out a pre-test ($O1$) to determine motivation and initial learning outcomes. Then given treatment (X) (treatment), followed by a post-test ($O2$) to determine motivation and final learning outcomes.

This research was conducted at MTS Ibnu Hajar Bulupitu Gondanglegi Malang. The sampling technique used in this study was the saturated or census sampling technique. Saturation sampling is a sampling technique where all members of the population are used as samples. Because the population of this study is relatively small, consisting of 25 students in class VIII A.

The research design is shown in Table 1.

Table 1. Single group pre-test-post-test design

Pretest	Treatment	Posttest
O_1	X	O_2

Description:

$O1$ = value before testing (before processing)

X = Processing with Wordwall learning materials

$O2$ = value after testing (after processing)

The instrument used in this study was a questionnaire made in the form of statement items made according to the indicators to be measured, so that it can be guided by the objectives of the problem and the research hypothesis. The questionnaire was used to determine students' mathematical motivation. The questionnaire used was a checklist using the Guttman scale. The data collection technique used was a questionnaire. The analysis technique used was the Wilcoxon Signed Rank Test and quantitative descriptive analysis. Arikunto (2018) showed that the details of the types of learning motivation are given in Table 2.

Table 2. Classification of student learning motivation

No.	Percentage Range of Learning Motivation	Result
1.	80% – 100%	Very Good
2.	66% – 79%	Good
3.	56% – 65%	Satisfied
4.	40% – 55%	Less
5.	< 39%	Very Less

The formula for calculating the percentage of student learning motivation is as follows:

Motivational presentation $= \frac{number\ h\ of\ scores\ obtained\ h}{maximum\ score} \times 100\%$

After the pretest and posttest scores are obtained from the scoring results, the next step is to calculate the average increase in student learning outcomes, namely by calculating NGain. In this process using the following Excel, the normalization of N-Gain is classified into three categories, according to Table 3.

Table 3. N-Gain Value Classification

Value Range	Clasification
g> 0,70	High
0,30 >(g)< 0,70	Moderate
g< 0,30	Low

Result and Discussion

Student Learning Motivation

Student motivation during learning was measured using a learning motivation questionnaire. This learning motivation questionnaire was given during the pretest to see students' initial motivation before being applied with the Word Wall media. Then the questionnaire was given again during the posttest to see students' final motivation after being applied with the Word Wall media. The results of students' learning motivation are given in Figure 1.

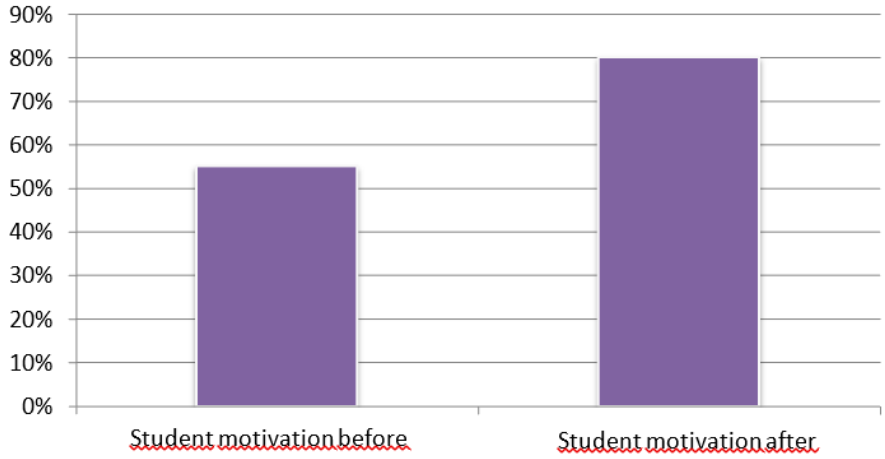


Figure 1. Student learning motivation results

During the learning process, the results of student learning motivation before the Word Wall media was applied were 55% with poor criteria and the results of student learning motivation after the word wall media was applied were 80% with very good criteria. There is a change between student learning motivation before and student learning motivation after, so it can be concluded that the learning process using Word Wall media can increase student learning motivation.

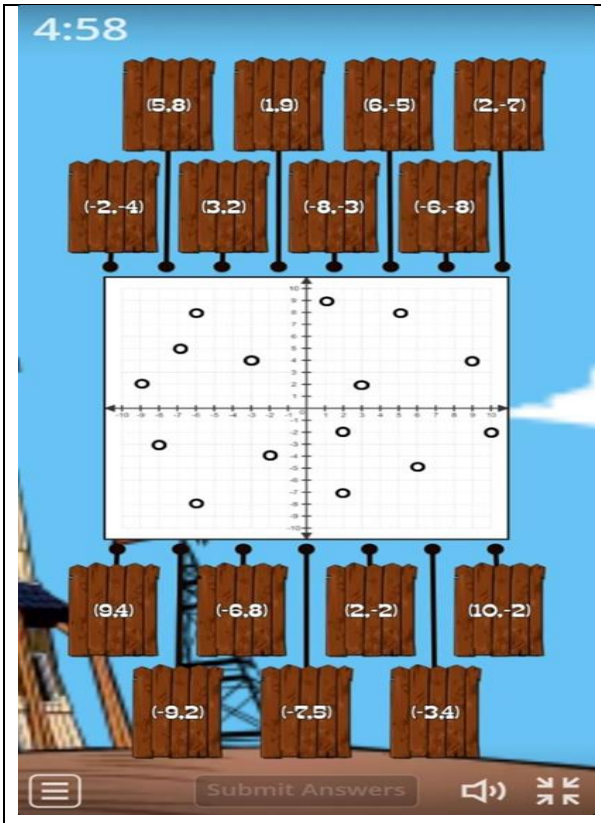
Student Learning Outcomes

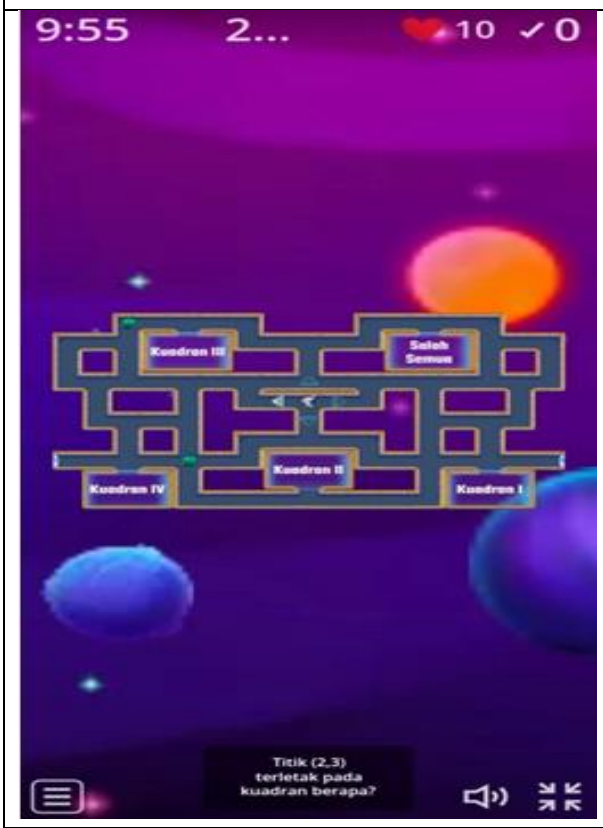
Boredom with something monotonous can happen at any time. Therefore, creativity and innovation in learning media must be carried out to increase students' interest and motivation to learn. When students start to lose interest and motivation to learn, especially during a pandemic like this, it is the educator's job to restore students' interest and motivation to learn. One thing we can do is use various learning materials.

Based on the results of the researcher's observations, the means used by the researcher of class VIII A MTS Ibnu Hajar Bulupitu in learning mathematics used word walls. Wordwall (Sherianto, 2020) is an application that can be used as a learning medium, learning resource and assessment tool for teachers and students. Wordwall also provides several examples of teacher creativity that can help new users to be creative. This learning media (Halik, 2021) can also be understood as a web application used to create fun puzzle-based games. In addition, word walls can also be used to design and review academic assessments.

The steps that can be used to be able to use the Wordwall application are: 1) Of course, so that we can use this application as a means of learning mathematics, the first step we must do is create or register an account at https; // Wordwall.net, then complete the data, the material is listed there, 2) Select create an activity then select one of the available templates, 3) Write the title and description of the game, 4) Write the desired content according to the type of game desired, 5) Select finish, as the last step when we are done with it.

The following are some examples of the results of the Wordwall media model in class VIII A mathematics learning on Cartesian Coordinates material, which were used during the research. Where class VIII researchers prepared teaching materials which were then applied in a learning media and then distributed and used for children's learning. The models used are as follows:

	For this feature, students can match the available choices with the correct answers.

	For the selection feature or what is often called multiple choice, however, what differentiates the multiple choice feature on the Word Wall website from the usual multiple choice questions is that the features presented by Word Wall are very interesting and some are even equipped with sound to make them more interesting.
	The difference between this feature and the previous feature is only in the design in it. This one feature is very similar to a game.

In calculating student learning outcomes in this study, N-Gain data analysis was used, which is data on the increase in student abilities between the pretest and posttest scores of the control class. N-Gain data or normalized gain to see the increase in student learning outcomes, and the N-Gain value will be used to see the effectiveness of using word wall media in learning mathematics on Cartesian coordinate material. The following is a table of 4 results from the assessment before and after the application of Word Wall media.

Table 4. Pretest and Posttest Results

No.	Student name	Pretest result	Posttest result
1	AI	80	95

No.	Student name	Pretest result	Posttest result
2	BL	50	80
3	AZ	60	85
4	AA	65	90
5	AU	90	100
6	FA	75	90
7	HI	40	85
8	HL	60	95
9	LU	30	75
10	ML	90	100
11	RI	75	95
12	FA	70	90
13	MS	75	85
14	ND	90	100

The average pretest produced was 70.47 and the average posttest produced was 90.91. Based on the difference in the average obtained, the learning outcomes of mathematics on the Cartesian coordinate material before and after receiving learning with word wall media increased by 21.43 with a moderate increase category. In addition, based on the results of the normalized gain index analysis, the results obtained were 0.751. This means that the learning outcomes of students in the experimental class experienced a high increase.

Conclusion

Based on the results of the study, before implementing the Word Wall media, the motivation to learn mathematics was not good, while after implementing the Word Wall media, the motivation to learn mathematics increased to very good. The use of Word Wall media is able to create an atmosphere in learning that is fun and not boring. So there is an influence in the use of Word Wall media on the results of learning mathematics on the Cartesian coordinate material, it can be seen based on the N-Gain test that there was a high increase between before and after the application of Word Wall media.

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