

THE EFFECT OF TIMES GAMES AND TOURNAMENTS WITH THE HELP OF WORDWALL ON STUDENTS' MATHEMATICAL CONNECTIONS AND SELF-EFFICACY

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Abstract

This research aims to determine the effect of Times Games and Tournaments with the help of Wordwall on mathematical connections and Self-Efficacy with students who use conventional methods. This type of research is quasi-experimental with a research design in the form of The Nonequivalent Pretest-PosttestControlGroup. The population taken for this research were all class VIII students at MTSN 4 Serang. The sample chosen was a Purposive Sampling technique, and class VIII-F was selected as the control class and class VIII-H as the experimental class, the number of students was 35 people. Data was collected through a test in the form of 5 essay questions that measured mathematical and non-test connections as a SelfEfficacy questionnaire. Data analysis includes data normality test, data homogeneity test, t-test, and quantitative descriptive analysis. The research results stated; (1) The results of the Dependent sample t-test in the experimental class and control class each show the $t_{count} < t_{table}$ value, so that (H_0) is rejected and (H_1) is accepted. (2) Independent sample t-test in the experimental class and control class also shows that the $t_{count} < t_{table}$ value, so that H_0 is rejected and H_1 is accepted. (3) The results of the questionnaire validity test show that the value of $t_{count} < t_{table}$, so that H_0 is rejected and H_1 is accepted. This research concludes that there is a significant difference in the level of mathematical connection ability and Self-Efficacy between students who use Times Games and Tournaments with the help of Wordwall and conventional learning.

Keywords: *Times Games and Tournament Learning Model, Mathematical Connection, and Self Efficacy.*

INTRODUCTION

Education is the process of an individual or group in changing attitudes to mature humans through learning and training efforts as well as other educational methods. Education is an essential thing in everyday life for students, teachers and society. Education has undergone very drastic changes in the development of today's modern era due to technological developments (Fitrianti, 2023).

The development of technology is one

of the essential things in education that has a positive and negative impact on the people of Indonesia. There is a regulation of the Minister of National Education of the Republic of Indonesia No. 41 of 2007 concerning Process Standards for School Education Units that is a reference to the system of social behavior aimed at developing the quality of the Indonesian population in overcoming problems related to technological developments.

According to Manullang, et al (2017)

define the cooperative learning model as a learning process by using small groups in instructing students to learn so that they can cooperate optimally in group or individual learning. This statement is supported by Rusyanto (2021) several types of cooperative learning models including: *Student Teams Achievement Division* (STAD), *JIGSAW*, *Group Investigation* (IK), *Think Pair Share* (TPS), *Numbered Head Together* (NHT) and *Times Games and Tournament* (TGT).

According to Rusyanto, 2021: 16 *Times Games and Tournament* (TGT) is one of the cooperative learning developed by David Devrics and Slavin. In the TGT learning model, the teacher presents a lesson material and students are divided into small groups to ensure that all group members have completed the questions from the lesson. Reinforced by Ridwan A. Sani's opinion, TGT is a group learning model to cooperate or discuss, understand the material and complete exercises before competing with other groups in tournaments (Rusyanto, 2021: 16). The TGT learning model is recommended in classroom conditions where there are still students who do not want cooperation or discussion with their study group due to getting grades according to their understanding. Therefore, with this TGT learning model, students interact, discuss, and solve problems in cooperation and can be responsible for the results of group work.

According to Harlina (Purnamasari et al., 2020) stated that *Wordwall* is an alternative interactive and fun learning media in the learning process so as not to get bored quickly learning for students or teachers.

Wordwall is one of the exciting web site applications in a browser. The purpose of this application is specifically for learning references, media and assessment tools that can please students, *Wordwall* also provides features that make it easier for teachers to produce a creation so that users can describe the results of their creations. *Wordwall* has

several different types of games that students can use such as quizzes, matchmaking, random anagrams of words, word searches, grouping, etc. *Wordwall* can be helpful in a math lesson in the classroom. *This Wordwall* can help students who lack enthusiasm in learning, this medium can be fun and can help students to improve the learning process better. Because, learning mathematics is still seen as problematic for students due to the lack of interactive media supporters so that students do not get bored in learning.

The ability of mathematical connection is one of the mathematical abilities that must be possessed and applied to students. In line with what Hendriana H, et al. (2017: 83) stated that there are several indicators of mathematical connections, namely; a) looking for relationships to various representations of concepts and procedures, b) understanding the equivalent representations of the same concept, c) looking for connections from one procedure to another in equivalent presentations, d) using mathematics in other fields of study or everyday life, e) use and assess the relationship between mathematical concepts and the relationship between mathematical concepts and concepts outside mathematics.

According to Isnaeni et al., (2018) students still experience low mathematical connections can be caused, namely; students do not fully understand the material before and after learning, lack of interest, motivation and confidence of students to learn because teachers use conventional learning. In line with the results of researchers who have made observations, interviews, questionnaires and student question tests still seem to be lacking in connecting the relationship of a mathematical concept to everyday life. Because the students' thinking power to describe something in mathematics is

connected with other concepts is still weak.

Self Efficacy (SE) means a person's self-confidence in his ability to manage and achieve specific results (Urfa Devina, 2023). In line with this research, a person's Self Efficacy is significant in competing for student achievement in class. Because students are not only required to be able to solve questions but to be able to present the results obtained. According to Hendriana, et al (2021) Self Efficacy has several detailed indicators into the dimensions of student self-confidence, namely; a) Magnitude dimensions include; the extent to which students can overcome learning difficulties, such as having a positive view of completing assignments and lessons, showing high interest in assignments and lessons, developing skills and achievements, considering complex assignments as challenges, following a regular study schedule, and acting selectively in achieving objective. b) Strength dimensions such as; How far is the level of student strength in facing learning difficulties involving efforts that can improve achievement well, commitment to completing the assignments given, confidence in their abilities, perseverance in completing assignments, having positive goals in completing assignments and having high motivation for self-development . c) Generality Dimension in the form of; the extent to which students' general dimensions can be applied in various activities and situations, including the ability to deal with different situations well and think positively, use experience as a path to success, have an interest in looking for new situations, and the ability to deal with various situations effectively.

One's self-confidence must be possessed by students, with the confidence of the student learning process is more active and quickly understands the material presented. In line with Rochim, et al. (2023) *Student Self Efficacy* (self-confidence) can form character so that

students can be trained in good habits and attitudes in learning. Because, it is still low in student confidence, because students consider mathematics challenging to learn and when given assignments not all students do the assignment.

Based on the results of the description above, the author feels interested to see the influence of students *who use Times Games and Tournament* assisted by *Wordwall* media on mathematical connection ability and *Self Efficacy* with those who use conventional learning models. Therefore, this study is titled "The Effect Of Times Games And Tournament With Wordwall Assistance On Students' Mathematical Connection And *Self Efficacy*."

The purpose of the study is seen from the results of observations and interviews that have been conducted by researchers at MTSN 4 Serang obtained by students are still lacking to connect mathematical concepts in everyday life, students are easily pessimistic in doing math problems, with the use of *Times Games and Tournament* can help students to overcome their problems. Because of this, it requires students to do assignments in groups and the learning process is carried out by playing and competing. In order for the learning process to run effectively, researchers use tools in the learning process in the form of *Wordwall*. *Reinforced by Rusyanto (2021) stated that TGT can improve student learning outcomes. In line with Ilahi et al., (2022) suggests that using Wordwall as a tool for student learning is more fun and not boring because it can make the learning environment will be helped. Therefore, it is expected that using the Wordwall-assisted TGT learning model can influence students towards mathematical connections and Self Efficacy.*

The benefits obtained from the use of this *Wordwall*-assisted TGT learning model can affect learning outcomes in the classroom such as students can relate one mathematical concept to another concept and students will have the confidence to

solve math problems. Reinforced by Killen's opinion (Pitriani et al., 2022) stated that the advantages obtained by students by using the TGT learning model are that students do not always depend on the teacher, encourage students to express an idea, can expand academic understanding and attitudes carried out, and students learn respect for others to accept existing differences.

METHOD

The type of research used is quasi-experiment, known as pseudo-experiment. According to Sugiyono (Setianti et al., 2022), fattening that the subject is in accordance with the class conditions that exist in quasi-experimental research. Therefore, this method was chosen because in schools it is not possible to create new classes, so existing classes are used. This study used The *Nonequivalent Pretest-Posttest Control Group Design*. Reinforced by Dantes' view, (2017: 16) *this design is stronger than the pre-experimental design, but weaker than the actual experimental (True)*.

This study is in the form, the research subjects are grouped heterogeneously purely from the actual state of the subject (R), the treatment of the experimental class (X) and the control class does not, both classes conduct the *Pretest-Postes Group Design Test* to find out the initial results and in the final results will be seen differences between the two. This design involves two classes, namely an experimental class using Wordwall-assisted TGT and a control class with conventional learning. According to Dantes, (2017: 15) the following is the design of the research design:

Table 1. Research Design

R	O ₁	X	O ₂
R	O ₃	-	O ₄

Information:

O1 : Pretest Experimental class

O2 : Posttest class Experiments
O3 : Pretest Class Control
O4 : Posttest Class Control
R : Sample randomization
X : Wordwall-assisted treatment of TGT models

The research population of all grade VIII students of MTS Negeri 4 Serang in the even semester of the 2022/2023 academic year is divided into 10 classes. Researchers chose grade VIII students as research subjects because they were intermediaries from classes VII and IX. Grade VII students are still adapting to the school environment, while grade IX students should focus on preparing for school exams. Therefore, the researcher chose grade VIII students as the object to be studied.

The source of this research data uses primary data which is data obtained directly from the research site in the form of mathematical connection ability tests and *Self Efficacy questionnaires*. The sample taken in the form of *puposive sampling* is a sampling technique based on consideration (Sugiyono, 2022: 138). The data collection techniques carried out are; observations, interviews, tests, questionnaires and documentation.

RESULT AND DISCUSSIONS

The *paired sample t-test* was conducted on *pretest* data from experimental classes that followed the TGT learning model with the help of Wordwall. This test aims to assess differences in mathematical connection capabilities before receiving treatment with Wordwall-assisted TGT learning models and compare them with conventional models. Here are the *paired sample t-test* results in the table below:

Table 5. Test Results Dependent Sample t-Test

Experimental class

Kelas	Sig. (2-tailed)	Keterangan
Eksperimen	.000	H0 ditolak

From the table above, there is a *Significant (2-tailed)* value of $0.000 < 0.05$ then H0 is rejected and H1 is accepted. So, it

can be concluded that there is a significant difference in the *pretest results in the experimental class in the mathematical connection ability of students.*

Table 6. Test Results Dependent Sample t-Test Control class

Kelas	Sig. (2-tailed)	Keterangan
Kontrol	.000	H ₀ ditolak

Based on the tabel, a *Sig. (2-tailed) value* of $0.000 < 0.05$ is obtained so that H₀ is rejected and H₁ is accepted. Thus, it was concluded that there was a significant difference in the *pretest results in the control class in mathematical connection ability.* As a result, it can be concluded that both learning with the *Wordwall-Assisted TGT learning model* and the conventional learning model both have a significant influence on students' mathematical connections.

The Independent *sample t-test* test was carried out on *experimental class posttest data using the TGT learning model* with the help of *Wordwall* or *control class posttest data using conventional learning models.* This test aims to assess the difference in students' average mathematical connection ability scores between experimental and control classes after receiving treatment.

Table 7. Test Results Independent Sample t-Test

Kelas	Sig. (2-tailed)	Keterangan
Eksperimen dan Kontrol	.008	H ₀ ditolak

Based on the table above, *obtained Sig. (2-tailed) values* of $0.008 < 0.05$ so that H₀ is rejected and H₁ is accepted. So, it was concluded that there was a significant difference in *posttest results* between the experimental class and the control class in students' mathematical connection ability. So it can be concluded that the *Wordwall-assisted TGT learning model* has a significant influence on the ability of mathematical connections compared to conventional learning models. This is reinforced by the fact that the average end of mathematical connection ability of students using the *Wordwall-assisted TGT learning model* is better than the conventional learning

model.

Table 9. Results of Self Efficacy Indicator Presentation

Indikator Self Efficacy	PENILAIAN Skor Max	Presentase	Kriteria
Magnitude: (Tingkat/Level Belajar Siswa)			
Derajat keyakinan dapat atasi kesulitan belajar	444	81%	Sangat Kuat
Bersikap optimis dalam mengerjakan pelajaran dan tugas	336	79%	Kuat
Strength: (Kuat/Tinggi Keyakinan Siswa)			
Memiliki tujuan yang positif dan motivasi yang baik	296	75%	Kuat
Memandang kesulitan sebagai tantangan	486	83%	Sangat Kuat
Generality: (Umum/ Luas Keyakinan Siswa)			
Menjadikan pengalaman yang lalu sebagai jalan untuk kesuksesan	129	69%	Kuat
Rata-rata Presentase		82%	50

Based on the percentage results of 1, 2, 3, 4, 5, 6, 7, 9, 11, 20, 21, 22, 27, 28, 29 and 31 in Table 8 shows that the indicator has solid criteria. Meanwhile, indicators 30, 43, 44 and 42, 45 have substantial criteria. The highest percentage is found in indicators that evaluate learning processes and outcomes, which is 83%. While the lowest percentage is in indicators related to choosing and applying learning, which is 69%.

This study aims to determine the use of the TGT learning model with the help of *Wordwall* on mathematical connections and *self-efficacy* in class VIII MTSN 4 Serang. The experimental class applied the *Wordwall-assisted TGT learning model*, while in the control class using conventional learning, the material taught was cartesian coordinates.

The ability of mathematical connections is that students are able to have a positive impact, because students can connect a mathematical concept to everyday life. Mathematical connections are critical in learning mathematics. According to NCTM (Sopaheluwakan, et al. 2021) states that students' understanding will be more prolonged and more profound, when students are able to connect mathematical ideas. In the field, more than 2 students still seem to have difficulty connecting between mathematics topics and between other topics in the learning process. This is in line with the views of Hadin, et al (Sopaheluwakan, et al.

2021) stating that the ability of mathematical connections needs to be emphasized in mathematics learning, because students are able to connect topics and understand the relationship between these concepts.

Based on the results obtained in the description above, it can be concluded that this ability can connect mathematically in cartesian coordinate lessons because students are required to connect mathematical concepts to other concepts. Students will easily understand mathematics lessons if students can already connect mathematics itself.

Self Efficacy consists of two aspects, namely confidence and ability. The belief aspect is closer to one's belief to get what one wants, while the ability aspect is based on experiences gained in the past (Dewi & Nuraeni, 2022)—according to Bandura (Sugandi & Akbar, 2019) explained that *Self Efficacy* can be increased by several primary factors, namely; *Mastery Experience*, *Vicarious Experience*, *Verbal Persuasion* and *Physiological and Affective states*.

Based on the description above, it can be concluded that the confidence of students who use the TGT model with the help of *Wordwal* has an excellent influence. Therefore, the learning process of students has confidence that can make students more active and not easily pessimistic in learning.

CONCLUSION

The results of this study in class VIII at MTSN 4 Serang regarding the use of the TGT learning model with the help of *Wordwall* on mathematical connections and *student Self Efficacy* obtained the following conclusions:

There is no significant difference in Initial Mathematical Ability between the use of the *Times Games And Tournament (TGT) Wordwall-Assisted* learning model and students using Conventional learning

There is a significant difference in the mathematical connection skills of those running the *Wordwall-Assisted Times Games And Tournament (TGT)* with

students who follow the conventional learning model

Student Self Efficacy shows solid criteria in the *Times Games And Tournament (TGT) learning model* Assisted by *Wordwall*, because students are required to have self-confidence so that they are not easily pessimistic in doing complex problems.

Based on the results of this study, it is expected to provide helpful information to understand the influence of the *Wordwall-assisted TGT learning model* on mathematical connections and *student Self Efficacy* in mathematics learning. This information can be helpful for students, teachers, and subsequent researchers in improving mathematics learning.

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