Difference Results Study Mathematics And Activity Study Using Learning Models Cooperative Type *Teams Games Tournament* (TGT) and *Numbered Heads Together* (NHT) on Material Operation Count Algebra

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Abstract

This study aims to investigate the disparities in mathematics learning outcomes of students instructed through the Teams Games Tournament (TGT) and Numbered Heads Together (NHT) cooperative learning methods concerning algebraic arithmetic operations. The study was conducted at SMP Muhammadiyah Jayapura. This research employs an experimental design using counterbalancing. The study population comprised class VII of SMP Muhammadiyah Jayapura during the 2024/2025 academic year, with the research sample consisting of classes VII-B and VII-C, each containing 34 pupils. The sample selection employed a purposive sampling method. Data on learning outcomes were obtained through a validated assessment instrument. We analyzed the pretest and posttest scores to derive normalized learning outcome values (N-gain). Due to the non-normal distribution of the data, we evaluated the N-gain value using non-parametric statistics via the Wilcoxon test. The study's results showed a significant difference in learning outcomes between the Teams Games Tournament (TGT) and Numbered Heads Together (NHT) cooperative learning models, with a sig. ρ value of 0.401, which is higher than 0.05. The mean N-gain value in Teams Games Tournament (TGT) (0.93) surpassed the mean N-gain value of Numbered Heads Together (NHT) (0.92). The study's results indicated that student engagement in learning through the Numbered Heads Together (NHT) method surpassed that of the Teams Games Tournament (TGT) model. The disparity in activity was substantial according to the Wilcoxon test, with a significance level of sig. ρ = 0.705.

Keywords : Learning outcomes, TGT and NHT learning models, N-gain

INTRODUCTION

Education hold role important in life human . Education face Lots challenge And obstacles faced by world education . One of the constraint that is the low quality education . Teachers are Wrong One component the main one that has role And task important in success increase quality education in Indonesia (Mufida 2024) . According to The Sop (2016) importance the role of teachers in learning is inseparable from teacher's ability to convey knowledge to participant educate . When the teacher presents ideas in a interesting And the steps clear , then the idea will become easy understood And understood participant educate . In his role as manager class , teachers must capable create atmosphere regular study And fun , so participant educate feel comfortable And safe moment Study .

Results Study participant educate increase in a way significant Because existence capable teacher performance create atmosphere interactive classes , so participant educate more active participate in discussion And activity learning . Besides that with the existence of criteria minimum completeness (KKM) as reference , then the teacher can evaluate that results Study mathematics on participant educate whether Already fulfil established standards .

Based on fact that There is participant sleeping student on moment learning And There is also the difficult one understand concepts mathematics . Other factors that cause low results Study mathematics is a lack interest participant educate in follow lesson mathematics caused existence assumption that mathematics is wrong One eye the most

difficult lesson And scary (Kamarullah 2017) . According to research Lepith et al. (2024) show that by using the learning model cooperative type *Numbered Heads Together* (NHT) on material operation count algebra there is improvement results learn . Besides That Also according to Eka, et al. (2022) that results Study participant students who use learning models cooperative type *Teams Games Tournament* (TGT) more tall from on participant students who study using a learning model cooperative type *Numbered Heads Together* (NHT) on material operation count algebra .

However until currently still there are teachers who use learning models conventional in learning mathematics , meaning participant education is not directed For understand draft mathematics in a way independent so that participant educate Not yet directed For understand the material yourself studied . Learning model conventional the Not yet capable develop ability *cognitive* (reasoning), *affective* (attitude), and *psychomotor* (skills) in general maximum . In the learning process teach expected can created interaction proper educative between teachers and participant educate so that objective learning mathematics can achieved (Arrasyid, et al. 2022) .

For reach success participant educate in learn , then always attempted by studying in a way active . A group participant students who have interaction between teachers and participant educate , and participant educate with participants educate other then it is called as Study in a way active . If this happens then it will seen freedom between participant educate in move , ask , or convey opinion (Mislinawati, Sulaiman 2017) . By using the learning model cooperative type *Teams Games Tournament* (TGT) and *Numbered Heads Together* (NHT) can overcome problem learning mathematics , participants educate Can each other help in understand draft about material studied without stressed together Friend group And participant educate will active in solve the problems presented so that can increase performance learning . Purpose This research is for describe And analyze difference between results Study mathematics participant students who are taught using a learning model cooperative type *Teams Games Tournament* (TGT) and *Numbered Heads Together* (NHT) on Material Operation Count Algebra in Class VII of Muhammadiyah Junior High School Jayapura.

METHOD

Design This research is a research experimental pseudo (*qua si experimenta l design*) because researchers are unlikely can control all relevant variables (Arib et al. 2024) . Design experiment in This research is a design *counterbalance* . Design This research uses two class Where every his class is class experiment And no k there is class control because inside This design is done the same *treatment* in every his class (Dani, et al. 2020) . Next can be noticed design *counterbalance* in table 1 below .

Table 1Counterbalance

	Material I	Material II	Material III	Material IV
Class VI I-B	P_1 x_1	P_2 x_2	P_1 x_1	P_2 x_2
Class VI I-C	P_1 x_2	P_2 x_1	P_1 x_2	P_2 x_1

Population on This research is the whole class VII of Muhammadiyah Jayapura Middle School 2024/2025 consists of 240 people consisting of from seven class . Taking sample done use *purposive sampling*

Abdullah, et al. (2022) . In this research , researchers choose sample class VII-B da n class VII-C because reviewed from understanding And equality class .

RESULTS AND DISCUSSION

Before learning done , participants educate do *pretest* . After learning participant educate will do *posttest* . System evaluation based on on rubric assessment that has been made researcher . Results test the Then analyzed For test hypothesis . From the results analysis , value participant educate show that learning model *Teams Games Tournament* (TGT) differences in a way significant with *the Numbered Heads Together* (NHT) model. This can seen from results test *Wilcoxon* with value $sig.\rho = 0{,}401$See Table 2 for the *Wilcoxon test results.* The average value *N-gain* on *Teams Games Tournament* (TGT) (0.92). This shows that learning model *Teams Games Tournament* (TGT) more effective compared to learning models *Numbered Heads Together* (NHT). This is supported by results test *Wilcoxon* with value $sig.\rho = 0{,}401$, next Look Table 2 below .

Table 2. Wilcoxon test

Test Statistics [a]	
	NHT Gain – TGT Gain
Z	-.840 [b]
Asymp . Sig. (2-tailed)	.401
a. Wilcoxon Signed Ranks Test	
b. Based on positive ranks.	

Based on sheet observation participant educate , can stated that the average percentage activity learning using learning models *Teams Games Tournament* (TGT) is 87,5%, while *Numbered Heads Together* (NHT) is 88%. Both of them including in category very active . Note Table 3 below .

Table 3. Results Observation

Group	**Presentation Activity Participant Educate**		**Criteria Interpretation Score**
	VII-B	**VII-C**	
Using the TGT learning model	89%	86%	Very Active
Using the NHT learning model	89%	87%	Very Active

Table 4. Differences Results Observation

Test Statistics [a]	
	NHT – TGT
Z	-.378 [b]
Asymp . Sig. (2-tailed)	.705
a. Wilcoxon Signed Ranks Test	
b. Based on negative ranks.	

Based on results analysis can known that there is no significant difference about activity Study participant students who are taught using a learning model cooperative type *Team Games Tournament* (TGT) and who is taught using ka n learning model cooperative type *Numbered Heads Together* (NHT). For see difference activity Study student the done statistical test using test *Wilcoxon* $sig.\rho = 0{,}705$. This shows that there is no difference activity significant learning use both learning models the take note Table 4.

CONCLUSION

Based on results analysis And discussion , then obtained conclusion that There is difference results Study mathematics participant students who are taught using a learning model cooperative type *Team*

Games Tournament (TGT) and learning models cooperative type *Numbered Heads Together* (NHT) on material operation count algebra , in class VII of SMP Muhammadiyah Jayapura. This is shown from results testing , there is significant difference that is 0,401. However both models show activity Study students who almost same as category very active .

SUGGESTION

Based on conclusion research , it is recommended that teachers use a variety of learning models , such as the cooperative model . type *Teams Games Tournament* (TGT) and *Numbered Heads Together* (NHT) for increase results Study mathematics And avoid boredom students . School should facilitate teachers to increase competence they implementing learning models cooperative in classroom learning .

THANK-YOU NOTE

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