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The Effectiveness of Worksheet-Based Tri-N on Students' Mathematical Critical and Creative Thinking Abilities Material on Linear Equations in One Variable

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Abstract: This research is motivated by the fact that most junior high school students have low critical and creative thinking abilities when facing mathematical problems. Even though these two abilities can be used as a basis for solving a mathematical problem, this research aims to determine the effectiveness of Tri-N based LKPD on students' critical thinking and creative thinking skills in One Variable Linear Equations material. The research method used is an experimental method with a Posttest-Only Control Design. The sample size was 39 students in a private junior high school in Piyungan, Bantul. This sample was taken using a cluster random sampling technique. The instrument used in this research is a mathematical problem test, which aims to measure critical and creative thinking abilities in dealing with mathematical problems. The data analysis technique used is the MANOVA test. The research results show that learning mathematics on equations and linear inequalities in one variable using Tri-N based worksheets does not significantly affect students' ability to think critically and creatively. In connection with the results of this research, Tri-N based LKPD on equations and inequalities in one variable can be used as an alternative teaching material for mathematics learning in equations and inequalities in one variable.

Keywords: Critical Thinking; Creative Thinking; Worksheet; Tri-N

Abstrak: Penelitian ini dilatarbelakangi bahwa sebagian besar siswa SMP memiliki kemamppuan berpikir kritis dan kreatif masih rendah saat menghadapi masalah matematis. Padahal dua kemampuan ini dapat digunakan sebagai dasar untuk menyelesaikan suatu permasalahan matematika. Penelitian ini bertujuan untuk mengetahui efektivitas LKPD berbasis Tri-N terhadap kemampuan berpikir kritis dan berpikir kreatif siswa pada materi Persamaan Linier Satu Variabel. Metode penelitian yang digunakan adalah metode eksperimen dengan desain *Posttest-Only Control Design*. Ukuran sampel sebesar 39 siswa SMP swasta di Piyungan, Bantul. Sampel ini diambil dengan teknik cluster random sampling. Instrumen yang digunakan dalam penelitian ini adalah tes masalah matematis yang bertujuan untuk mengukur kemampuan berpikir kritis dan kreatif dalam mengahdapi masalah matematis. Teknik analisis data yang digunakan adalah uji MANOVA. Hasil penelitian menunjukkan bahwa pembelajaran matematika pada materi persamaan dan pertidaksamaan linier satu variabel menggunakan LKS berbasis Tri-N tidak berpengaruh signifikan terhadap kemampuan siswa dalam berpikir kritis dan kreatif. Berkaitan dengan hasil penelitian ini, LKPD berbasis Tri-N pada materi persamaan dan pertidaksamaan satu variabel dapat digunakan sebagai alternatif bahan ajar pembelajaran matematika pada materi persamaan dan pertidaksamaan satu variabel.

Kata kunci: Kemampuan Berpikir Kritis; Kemampuan berpikir Kreatif; Tri-N; LKPD

Introduction

Education is a forum where everyone can become the nation's next generation. The types of education in Indonesia are very diverse. Still, mathematics education is one of the subjects that most students are bored with, so mathematics education requires quality human resources who can understand the knowledge and apply it throughout life (Usman, 2020). Mathematics education instils educational values that can make students intelligent and help develop their characters, such as critical thinking and creative thinking (Siswono, 2016).

Critical thinking is thinking complexly and using analysis and evaluation processes. It involves inductive thinking skills, such as recognizing relationships, analyzing open problems (with many possible solutions), determining cause and effect, making inferences, and considering relevant data (Rachmantika & Wardono, 2019). It's just that critical thinking habits have not been traditional in schools (Changwong et al., 2018; Halim, 2022). Schools encourage students to give correct answers rather than encourage them to develop new ideas or rethink existing conclusions. Too often, teachers ask students to retell, define, describe, and list rather than analyze, draw conclusions, connect, synthesize, criticize, create, evaluate, think, and rethink.

Previous research results show that junior high school students critical thinking abilities are still in the low category (Rosmalinda et al., 2021; Sani, 2019). This can be seen from the results of completing mathematics questions based on PISA type for students at SMP Negeri Belitang 3, and it was found that students did not meet the critical thinking stage, especially in the interpretation and inference indicators (Rosmalinda et al., 2021). A preliminary study conducted at SMP Negeri 10 Kendari on 34 class VII students found that the student's critical thinking abilities had not yet reached the excellent category (Sani, 2019).

Creative thinking is a method for solving problems that involve innovative, creative, critical, collaborative and communicative ideas. Learning is essential to understanding issues, creating mathematical models, solving problems, and interpreting solutions. Creative thinking is students' ability to generate new ideas and models to help them learn (Yasiro et al., 2021). Thinking creatively is a critical thinking skill needed in mathematics (Yuli et al., 2023).

Previous research shows junior high school students' creative thinking abilities are still in the low category (Effendi & Farlina, 2017; Sugilar, 2013). This can be seen from the results of research conducted on class VII students at MTs Alfalah, and it was found that overall, based on the test results, the fluency and elaboration indicators were interpreted well, the flexibility and originality indicators could be achieved with less interpretation (Effendi & Farlina, 2017). Likewise, research with preliminary studies conducted on SMP/MTs students' creative thinking abilities is still relatively low, and the ability to solve high-level category questions is still lacking (Sugilar, 2013).

Critical thinking and creative thinking skills enable students to study problems systematically, create innovative questions, organize multiple challenges, and create original solutions (Siswono, 2016). From this understanding, students must learn to think critically and creatively, which are the goals of education and a necessity for life (Safitriyanti et al., 2023).

Several factors can cause students' weak critical and creative mathematical thinking abilities. One of them is the learning process carried out. Mathematics learning must involve students actively and facilitate using their critical and creative thinking skills. Suppose students are allowed to practice their thinking skills. In that case, they will form a habit of being able to distinguish between true and false, conjecture and reality, fact and opinion, as well as knowledge and belief (Atih & Reni, 2022; Happy & Widjajanti, 2014; Ulva, 2018). Students can build arguments based on logical and reliable evidence (Siburian et al., 2019; Wechsler et al., 2018). Apart from that, students will also naturally think creatively. This is

demonstrated by forming a habit of connecting different things, seeing unexpected possibilities, and believing in new ways about commonly faced problems. Apart from the learning process that can actively involve students, learning tools such as worksheets can help students develop their critical and creative thinking skills.

While at school, of course, teachers and students need teaching materials to continue learning. One of the teaching materials that is necessary for teachers and students during learning is worksheets (Suryaningsih & Nurlita, 2021). Worksheets are teaching materials in electronic student worksheets, which aim to make it easier for students to carry out assignments given by the teacher and make it easier for teachers to evaluate students (Adawiyah et al., 2021).

In learning, one of Ki Hajar Dewantara's teachings, namely Tri-N. This concept is still not widely used in mathematics learning. Tri-N consists of three activities, namely *Niteni*, *Nirokke*, and *Nambahi* (Damayanti & Rochmiyati, 2019; Ermawati & Rochmiyati, 2020; Widada, 2020; N. Wijayanti et al., 2021). *Niteni* is marking by paying close attention and using all the senses. *Nirokke* imitates what has been taught through models or examples from teachers or learning sources by involving thoughts, sensations, feelings/conscience, and spirituality integrally and harmoniously. *Nambahi* is adding or subtracting what one has learned to develop creativity and ideas using existing learning resources.

In this research, researchers will use teaching materials in the form of Worksheet-based Tri-N. This worksheet aims to welcome the Merdeka curriculum so students do not have difficulty understanding mathematics material. As is known, the Merdeka Curriculum is a curriculum with intra-curricular learning and varied content so that students can be more optimal and have enough time to explore concepts and strengthen competencies. Tri-N was chosen in developing this worksheet because (1) the Tri-N model includes *Niteni*, *Niroke*, and *Nambahi* in line with the characteristics of learning in Indonesia, where students tend to observe, imitate and then add to the knowledge that students have received during learning (Ardhyantama, 2020), (2) There has not been much research related to mathematical worksheets with Tri-N, especially regarding equations and inequalities in one variable. These two reasons show that this research has novelty or added value and differs from previous research. Apart from that, there has never been any research related to the effectiveness of Tri-N worksheet based on critical and creative thinking skills

The worksheet-based Tri-N is made as attractive as possible so that students are interested and motivated when learning mathematics and are easy to observe, imitate and then add knowledge related to existing concepts in mathematics. With the help of the worksheet-based Tri-N, researchers carried out teaching activities on mathematics material. The mathematical material used in this research is a variable linear equation, which contains one variable to the power of one and uses a hyphen "=" (equal). One variable linear equations material is one of the materials given at the beginning of learning algebra. For this reason, students need to understand concepts related to one variable, linear equations, to understand and know the next algebra level (Kirvan et al., 2015; Murphy et al., 2016)

Based on observations of grade 8 students at Junior High School Pembangunan, Piyungan, Bantul during learning, it was found that most students still think that mathematics problems are challenging to understand, so they have difficulty solving mathematics problems. From the results of these observations, strategies teachers must carry out in the learning process to train students' basic mathematical abilities, namely critical and creative thinking abilities, are needed (Safitriyanti et al., 2023).

Based on this background, it is necessary to research the effectiveness of worksheet-based Tri-N on the critical and creative mathematical thinking abilities of junior high school students on linear equations in one variable. Effectiveness of learning is a learning process that achieves learning outcomes based on the set objectives. One indicator to measure learning effectiveness includes the grades students can obtain through tests. The test in this

research is a test of the ability to think critically and creatively. Therefore, this research aims to determine the effect of worksheets on students' critical and creative mathematical thinking abilities on linear equations in one variable. Although previous researchers have carried out worksheets on equations and inequalities of one variable, such as worksheets based on Realistic Mathematics Education (Gustin et al., 2020), worksheets based on brain learning (Pramagda & Sari, 2021), worksheet-based problems with wetland environmental context (Azizah et al., 2023), and worksheet based scientific approach (Halimah et al., 2023), but worksheets on the same material as the Tri-N approach have not been carried out by many researchers so far. Hence, this includes added value and differences with previous research.

Method

The type of research used is quantitative research using experimental methods. Experimental research determines the effect of specific treatments (Sugiyono, 2017). The practical approach used is more precisely quasi-experimental.

The population in this study were all class VII students at Junor High School in Piyungan, the odd semester of 2023/2024. From this population, two random courses will be selected using cluster random sampling. The cluster random sampling technique was used in this study because there is a large population, so the population was selected based on groups/classes to maintain the existence of samples in each treatment given. Two samples were obtained from the random selection of groups/classes: class VII A and class VII B. For class VII A, there were 21 students, while for class VII B, there were 18 students.

In this study, a post-test-only control group design was used. In this study, there were two groups, namely the first group as an experimental group, which was given treatment with the help of worksheet-based Tri-N and the second group as a control group, which was given therapy without the help of worksheet-based Tri-N.

The steps taken in this research were that both classes were given treatment according to what had been determined. Then, after being given treatment, the two classes were offered post-test questions regarding mathematics problems to measure critical thinking and creative thinking skills in one-variable linear equations. Both classes will be given a post-test with the same instruments. After the post-test, an assessment will be carried out following the scoring guidelines used.

The instrument used in this research was a mathematics test. This test aims to reveal students' abilities in critical and creative thinking. Scoring guidelines for critical thinking skills refer to indicators of interpretation, analysis, evaluation, and inference (Ariani, 2020; Facione, 2016; Peter, 2012; Putri, 2018). The complete essential thinking ability scoring rubric can be seen in Table 1.

Table 1. Critical Thinking Skills Scoring Rubric

Indicators	Criteria	Score
Interpretation	Don't write what is known and what is asked.	0
	Write what is known and what is asked incorrectly.	1
	Write only what you know accurately or what you ask correctly.	2
	Write what you know from the question correctly but incompletely.	3
	Write what is known and asked about the question correctly and completely.	4
Analysis	Do not create a mathematical model of the problem given.	0
	Create a mathematical model of the problem given, but it is not correct	1
	Make a mathematical model of the problem given correctly without giving an explanation	2
	Make a mathematical model of the problem given correctly, but	3

Indicators	Criteria	Score
	there are errors in the explanation	
	Make a mathematical model of the problem given correctly and provide a correct and complete explanation.	4
Evaluation	Does not use strategy in solving problems.	0
	We are using inappropriate and incomplete strategies to solve problems.	1
	Using the right strategy in solving the problem, but not wholly, or using an incorrect but complete strategy to solve the problem.	2
	Uses the right strategy in solving problems, is complete, but makes mistakes in calculations or explanations.	3
	Use the right strategy to solve questions and complete and correct calculations/explanations.	4
Inference	Make no conclusions.	0
	It makes conclusions that are incorrect and inappropriate to the context of the question.	1
	They are making inappropriate conclusions even though they are adjusted to the context of the question.	2
	Make conclusions appropriately, according to the context, but not completely.	3
	Make conclusions correctly, according to the context of the question.	4

Scoring creative thinking skills refers to the indicators of originality, elaboration, fluency, and flexibility (Alghafri & Ismail, 2014; Hu et al., 2016; Krisdiana et al., 2019; Mkpae & Obowu-Adutchay, 2017). The complete creativity thinking ability scoring rubric can be seen in Table 2.

Table 2. Creative Thinking Skills Scoring Rubric

Indicators	Criteria	Score
Fluency	No Answer	0
	Providing one correct answer solution or using appropriate mathematical strategies and procedures but not accompanied by reasons	1
	Provide one correct answer solution and use appropriate mathematical strategies and procedures using non-detailed reasoning	2
	Provide more than one correct answer solution, and almost all of them use appropriate mathematical strategies and procedures by providing more complete reasons	3
	Provide more than two correct answer solutions, and all use mathematical strategies and procedures that follow complete argument analysis	4
Flexibility	No Answer	0
	Finding a way to solve problems but using appropriate mathematical strategies and procedures without explanation	1
	Finding a way to solve problems and using appropriate mathematical strategies and procedures without complete reasons	2
	Find more than one way to solve problems, and almost all use appropriate mathematical strategies and procedures	3
	Find more than one way to solve problems, and all use appropriate	4

Indicators	Criteria	Score
	mathematical strategies and procedures	
Originality	No Answer	0
	Describes the solution to a given problem in a way that is different from other people's without explanation	1
	Describes the solution to a given problem in a way that is different from other people's but does not follow the concept in question and is incomplete	2
	Describes the solution to a given problem in a way that is different from other people's and follows the concept in question but is less complete and precise	3
	Describe the solution to a given problem in a way that is different from others and follow the concept in question thoroughly and precisely	4
Elaboration	No Answer	0
	Describes the solution to the given problem in no detail	1
	Describes the solution to the problem given in less detail and correctly	2
	Describes the solution to the problem given in detail, but the argument analysis is not complete	3
	Describe the solution to the problem given in detail and correctly	4

The data obtained will then be analyzed. The data analysis technique that will be carried out is multivariate analysis. Multivariate statistical analysis is a method that makes it possible to research more than two variables simultaneously (Nursalam, 2020; Widodo, 2015). The data analysis stages are the normality, homogeneity, and MANOVA tests.

Result and Discussion

The experimental and control groups obtained critical thinking and creative thinking ability score data based on the research. Then, data processing will be carried out using IBM SPSS Statistics Version 25 to get the study results. The hypotheses in this research are:

H_0 : $\mu_1 = \mu_2 = \mu_3$ (There is no difference in critical and creative thinking abilities between students assisted by worksheet-based Tri-N and without worksheet-based Tri-N.)

H_1 : $\mu_1 \neq \mu_2 \neq \mu_3$ (There is a difference in critical and creative thinking abilities between students with the help of worksheet-based Tri-N and without the help of worksheet-based Tri-N)

The output data description was obtained after processing the data using SPSS, as shown in Table 3.

Table 3. Descriptive Statistics

Variable	Group	Mean	Std. Dev.	N
Critical Thinking skills	Control	5.83	2.333	18
	Experiment	5.33	1.798	21
	Total	5.56	2.049	39
Creative thinking skills	Control	7.50	2.065	18
	Experiment	7.57	2.135	21
	Total	7.54	2.075	39

Based on Table 3, it was found that the number of students was 39 people, consisting of 18 people in the control group and 21 people in the experimental group. The control group's average critical thinking ability score was 5.83, and the experimental group's was 8.33. The

overall average necessary thinking ability score is 5.56. The control group's average creative thinking ability score was 7.50, and the experimental group's was 7.57. Meanwhile, the overall average score for creative thinking abilities was 7.54. Next, a normality test will be carried out as an initial condition for the MANOVA test. The normality test is used to determine whether the sample comes from a population with a normal distribution or not a normal distribution (Ningrum et al., 2017). The normality test in this study used the Shapiro-Wilk test (see Table 4).

Table 4. Normality test

Variable	Group	Shapiro-Wilk		
		Statistic	df	Sig.
Critical Thinking skills	Control	.937	18	.257
	Experiment	.919	21	.084
Creative thinking skills	Control	.930	18	.190
	Experiment	.941	21	.224

Based on the calculation results, which can be seen in Table 4, It was found that in the Shapiro-Wilk column, a significance value was obtained for the control group's critical thinking ability score of 0.257 > 0.05, and the experimental group obtained a significance of 0.084 > 0.05. Both groups received a significance value greater than 0.05, which means the critical thinking ability scores in the control and experimental groups were normally distributed. For the creative thinking ability score in the control group, a significance value was obtained: 0.190 > 0,05, and the experimental group received a significance value of 0.224 > sig. 0,05. Both got significance values greater than 0.05, meaning the creative thinking ability scores of the control and experimental groups were normally distributed. Because both normality tests had a normal distribution, we continued with the homogeneity test as the second MANOVA prerequisite test. This homogeneity of variance test uses the Lavene test (see Table 5).

Table 5. Test homogeneity of variance

Variable		Lavene Statistic	df1	df2	Sig.
Critical Thinking skills	Based on Mean	.199	1	37	.658
	Based on Median	.259	1	37	.614
	Based on the Median and with adjusted df	.259	1	33.042	.614
	Based on trimmed mean	.221	1	37	.641
Creative thinking skills	Based on Mean	.209	1	37	.650
	Based on Median	.371	1	37	.546
	Based on the Median and with adjusted df	.371	1	35.806	.546
	Based on trimmed mean	.201	1	37	.656

The homogeneity test in this study aims to determine whether the variance of the experimental group post-test data (assisted by worksheet-based Tri-N) and the control group post-test data (without worksheet-based Tri-N assistance) is homogeneous or not (Saputri et al., 2020). In the Lavene's Test table, the sig value is obtained. On critical thinking and creative thinking abilities > sig. 0.05, which means that the data comes from a homogeneous population.

Once the two hypothesis prerequisite tests have been fulfilled, proceed with the MANOVA test. In the Multivariate Tests table, the Wilks Lambda section obtained a value of F=1.768 with a significance value of 0.185 > sig. 0.05 (see Table 6). These results indicate that H0 is accepted so that there is no difference in students' critical and creative thinking abilities

between students taught with the help of worksheet-based Tri-N and students conducted without the worksheet-based Tri-N.

Table 6. Multivariate Test

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.937	265.558	2.000	36.000	.000
	Wilks' Lambda	.063	265.558	2.000	36.000	.000
	Hotelling's Trace	14.753	265.558	2.000	36.000	.000
	Roy's Largest Root	14.753	265.558	2.000	36.000	.000
Groups	Pillai's Trace	.089	1.768	2.000	36.000	.185
	Wilks' Lambda	.911	1.768	2.000	36.000	.185
	Hotelling's Trace	.098	1.768	2.000	36.000	.185
	Roy's Largest Root	.098	1.768	2.000	36.000	.185

Furthermore, based on Table 7 shows that the relationship between the worksheet based on Tri-N (X) and the critical thinking skill (Y1) obtained an F value of 0.570 with sig. 0.455, more significant than the significance level of 0.05, means no difference in critical thinking ability scores is caused by differences in learning with or without assistance from worksheet-based Tri-N. For the relationship between worksheet-based Tri-N (X) and scores of creative thinking (Y2) obtained, an F value of 0.011 was accepted as a sig value. 0.916 is greater than the significance level of 0.05, so it can be interpreted that there is no difference in the score of creative thinking skills caused by differences in learning with or without the assistance of worksheet-based Tri-N.

Table 7. Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Critical Thinking skills	2.423	1	2.423	.570	.455
	Creative thinking skills	.049	1	.049	.011	.916
Intercept	Critical Thinking skills	1208.577	1	1208.577	284.522	.000
	Creative thinking skills	2201.588	1	2201.588	497.784	.000
Groups	Critical Thinking skills	2.423	1	2.423	.570	.455
	Creative thinking skills	.049	1	.049	.011	.916
Error	Critical Thinking skills	157.167	37	4.248		
	Creative thinking skills	163.643	37	4.423		
Total	Critical Thinking skills	1367.000	39			
	Creative thinking skills	2380.000	39			
Corrected Total	Critical Thinking skills	159.590	38			
	Creative thinking skills	163.692	38			

Furthermore, based on Table 7 shows that the relationship between the worksheet based on Tri-N (X) and the critical thinking skill (Y1) obtained an F value of 0.570 with sig. 0.455, more significant than the significance level of 0.05, means no difference in critical thinking ability scores is caused by differences in learning with or without assistance from worksheet-based Tri-N. For the relationship between worksheet-based Tri-N (X) and scores of creative thinking (Y2) obtained, an F value of 0.011 was accepted as a sig value. 0.916 is greater than the significance level of 0.05, so it can be interpreted that there is no difference in the score of creative thinking skills caused by differences in learning with or without the assistance of worksheet-based Tri-N.

Learning that allows students to learn efficiently, have fun, and achieve the learning goals set is the purpose of effective learning (Lin et al., 2017). In a learning process, teachers must optimize their skills to make learning activities more exciting and not dull. Teachers must be able to choose and use appropriate teaching materials in the learning process. The learning process must be optimal to change student behaviour after following the learning process to achieve educational goals (Istiqomah & Widodo, 2021).

Regarding effective learning, applying teaching materials can make the learning atmosphere more diverse and exciting, and students become active. A worksheet is a teaching material that can help students understand the material better and is easy to access (Marzuki, 2019; Nurhidayati, 2019; Utami et al., 2020). A worksheet is used to find out and measure the extent of the learning process that students have achieved (Firtsanianta & Khofifah, 2022; Kurniawati & Sukardiyono, 2018). A worksheet is part of the teaching material, which is made of several sheets containing primary material, summaries and practice questions worked on by students (Haryonik & Bhakti, 2018; Syafitri, 2020; Utami et al., 2020). Using worksheets in learning can be an alternative source of student learning (Faizah & Jamila, 2022).

Mathematics learning can allow students to actively participate in developing their mathematical abilities by utilizing learning media tailored to the material and student characteristics (Gusteti & Neviyarni, 2022; Pusporini et al., 2023; A. Wijayanti et al., 2022). One of the objectives of learning mathematics is to develop independent critical and creative thinking skills, which align with the Learning and Merdeka Curriculum objectives. (Nisa et al., 2023; Pusporini et al., 2023). The student's success in solving mathematical problems with their critical and creative thinking skills can determine whether or not the learning objectives have been achieved.

One of the materials used to measure students' critical and creative thinking abilities is a one-variable linear equation. This material is often used in everyday life, but there are still students who have difficulty working with it. Several factors cause this: students still cannot differentiate between variables, coefficients and constants. However, critical and creative thinking skills do not depend on whether the material is complex or challenging (Samura, 2019). No matter how complicated, students' problems in solving problems are considered problematic, and they can still achieve the goal of learning mathematics: developing critical and creative thinking skills.

This research differs from previous research, which stated that worksheets effectively improved creative thinking skills (Nuryanti & Nuryadi, 2023). Other research results also reveal that worksheets effectively enhance critical thinking skills (Puspita & Dewi, 2021). From the results of the research above, it was found that the critical thinking and mathematical creative thinking skills that students acquired with a worksheet-based Tri-N assisted learning were as good as the critical thinking and mathematical creative thinking abilities of students who learned without the assistance of worksheet based Tri-N so that The worksheet based Tri-N is as effective as other teaching materials used in one-variable linear equations. Even though the results of this research are different from previous research, in theory, the existence of worksheets can improve critical and creative thinking skills. The results of this study are different from research results in general, possibly due to the small sample size. Apart from that, the school used as a research site has just implemented a Merdeka curriculum, so students still have to adapt to the new curriculum.

Conclusion

Learning is effective if a lesson allows students to learn quickly, have fun and achieve the learning goals set. One indicator to measure learning effectiveness includes the grades students can obtain through tests. In this research, the test aims to measure students' critical and creative thinking abilities.

The results of the research show that statistically, using MANOVA, a significance coefficient of more than 0.05 is obtained, and this shows that learning assisted by Tri-N based worksheets on single variable linear equations and inequalities does not significantly affect students' ability to think critically and creatively. The results of this research only apply to the population used in this research, namely 8th-grade students at Piyungan Development Middle School, Bantul. Suppose the treatment of this research uses Tri-N based worksheets on equations and linear inequalities of one variable given to another sample or population. In that case, it is possible to obtain different results. Apart from that, this condition only applies to the material of equations and inequalities in one variable. If students are given Tri-N based worksheets for other mathematics material, it is possible to obtain different research results.

However, the results of this research show that Tri N's worksheet base does not affect students' ability to think critically and creatively. However, this worksheet can still be used as an alternative teaching material for learning mathematics,

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