

The Influence of Cooperative Learning Models and Formative Test Types on Students' Civic Education Learning Outcomes

Hamuni¹, Muhammad Idrus² and Aswati³

Abstract

This study examines the influence of cooperative learning models and formative test types on students' Civic Education learning outcomes. This research employed a 2x2 factorial design. The sample consisted of 80 students selected randomly using cluster random sampling techniques. Data were collected using a test instrument, and data analysis was performed using analysis of covariance (ANCOVA). The results of the study indicate that: (1) students taught using the Jigsaw cooperative learning model achieved higher Civic Education learning outcomes than those taught using the NHT (Numbered Heads Together) model; (2) students given essay-type formative tests achieved higher learning outcomes than those given multiple-choice tests; (3) there is an interaction effect between cooperative learning models and formative test types on students' Civic Education learning outcomes; (4) among students given essay-type formative tests, those taught with the Jigsaw model achieved higher learning outcomes than those taught with the NHT model; (5) among students given multiple-choice formative tests, there was no significant difference in learning outcomes between those taught with the Jigsaw model and those taught with the NHT model; (6) among students taught with the Jigsaw model, those given essay-type formative tests achieved higher learning outcomes than those given multiple-choice tests; (7) among students taught with the NHT model, there was no significant difference in learning outcomes between those given essay-type and multiple-choice formative tests.

Keywords: Cooperative Learning Models, Formative Test Types, Civic Education Learning Outcomes

INTRODUCTION

Educational activities in schools often face various challenges. Many students perceive Civic Education as a complex and challenging social science subject, leading to low performance in this area. Academic achievement in Civic Education has not been satisfactory, with many students scoring below the set standards.

As one of the subjects taught in junior high school, civic education is often criticized for producing lower learning outcomes than other subjects. Students generally dislike it, and it is seen as dull and tedious. This situation suggests that the teaching of Civic Education requires further scientific exploration to identify alternative teaching models that can help students achieve optimal learning outcomes.

Empirical data supporting this assertion is reflected in the average Civic Education scores of 7th-grade students at SMP Negeri 5 Kendari, as shown in the following table:

Table 1. Average Score of Civic Education at SMP Negeri 5 Kendari

Academic Year	Minimum Passing Criteria (KKM)	Average Score	Information
2019/2020	75,00	62,75	Below KKM
2020/2021	75,00	67,75	Below KKM
2021/2022	75,00	73,80	Below KKM

Source: Curriculum Documents, SMP Negeri 5 Kendari, 2022

This empirical data shows that the Civic Education scores of students at SMP Negeri 5 Kendari remain below the Minimum Passing Criteria (KKM) of 75.00 set by the school. In the 2019/2020 academic year, only 15.6% of students met the KKM, while 84.4% scored below it. In the 2020/2021 academic year, 14.5% of students met the KKM, and 85.5% were still below the KKM. In the 2021/2022 academic year, 16.7% of

¹ Universitas Halu Oleo Kendari-Sulawesi Tenggara-Indonesia

² Universitas Halu Oleo Kendari-Sulawesi Tenggara-Indonesia

³ Universitas Halu Oleo Kendari-Sulawesi Tenggara-Indonesia

students met the KKM, while 83.3% remained below the KKM. This data clearly illustrates that students' Civic Education scores at SMP Negeri 5 Kendari have not met the minimum competency standards required by the school (Curriculum Documents, SMP Negeri 5 Kendari).

The continued low achievement in this subject is a cause for concern for all parties involved, especially in efforts to improve the quality of Civic Education instruction. Therefore, corrective measures are needed to enhance Civic Education learning outcomes. One approach addresses factors that potentially influence student learning outcomes, such as teacher-related factors, students' attitudes, the curriculum, the quality of the teaching process, teaching models, and the types of assessments used, such as formative tests.

Further observation and classroom studies conducted during Civic Education lessons for 7th-grade students at SMP Negeri 5 Kendari revealed that lessons were monotonous, with students appearing bored and unmotivated to learn. One of the reasons students were uninterested in Civic Education was the lack of variety in teaching methods, as teachers did not use models that could engage and motivate students. As a result, low Civic Education outcomes can be attributed to a lack of student motivation and poor process skills, which hinder critical and creative thinking and ultimately affect learning outcomes.

The current approach to teaching Civic Education, including at SMP Negeri 5 Kendari, still positions teachers as the primary source of knowledge. While innovative teaching models like Jigsaw are sometimes used, teacher-centered methods such as lecturing still dominate, which is inconsistent with the intended instructional syntax. Teachers need to implement the chosen instructional models according to the lesson plans and ensure they follow the correct instructional steps.

Civic Education teachers should continue to innovate by combining several student-centered cooperative learning models of equal value. Teaching activities should encourage students to be more active and creative during learning. When students are engaged, innovative, and aware of their learning activities and the concepts they are learning, their learning outcomes will improve. According to Idrus (2017), Civic Education teaching has long been dominated by models emphasizing memorization of information, with students being forced to retain large amounts of information to achieve targeted scores. Teachers, meanwhile, have not yet become accustomed to student-centered cooperative learning models. This teaching method causes students to become bored and disengaged, failing to foster critical thinking, ultimately affecting their learning outcomes.

The teaching model is considered the most dominant among the many factors influencing learning outcomes. Thus, the learning process is a crucial indicator of achieving quality educational outcomes, and teachers play a central role in this process.

Implementing innovative cooperative learning models, such as the Jigsaw and NHT models, can address the challenges encountered in civic education teaching. Research by Rokot (2016) found that student learning outcomes are significantly influenced by the teaching models, specifically the Jigsaw and NHT cooperative learning models. These models improve learning outcomes and enhance students' motivation, engagement, and cooperation.

This study aligns with research by Hunter et al. (2015), which demonstrated that the NHT and Jigsaw cooperative learning models are effective strategies for improving classroom performance because these models accommodate students' needs and behaviors during the learning process.

In addition to the teaching model, formative test types, such as essay and multiple-choice tests, significantly affect students' learning outcomes. Hopkins (1981) asserts that essay tests can reveal students' critical thinking, synthesis, and evaluation skills. Similarly, Marrow (2005) suggests that essay tests are more effective in assessing students' organizational, analytical, and evaluative abilities than other test types. Research by Sumantri and Satriani (2016) supports these claims, showing that students who were given essay-format formative tests achieved higher scores than those given multiple-choice tests.

Based on the explanations above, it is assumed that the choice of cooperative learning model and essay-type formative tests can influence students' learning outcomes. To improve civic education learning outcomes, it is

necessary to enhance the quality of the teaching process. This can be achieved by providing lessons rich in meaningful activities and creativity, enabling students to become more active and skilled in problem-solving.

THEORETICAL REVIEW

Jigsaw Cooperative Learning Model

According to Kelly et al. (2018: 451-464), the Jigsaw cooperative learning model is a learning strategy that encourages students to think actively and creatively throughout the learning process. This model develops intellectual capabilities and nurtures emotional growth and skill development. Simaremare & Theosalonika (2021: 1-21) describe the Jigsaw cooperative learning model as dividing students into heterogeneous groups, with members from different groups taking responsibility for learning the same material. They then meet in expert groups to help each other understand their portion of the material. Afterward, they return to their original groups to teach the rest of the group members what they have learned in the expert group. Students are then evaluated individually on the material following group discussions. Furthermore, Simaremare & Theosalonika (2021: 1-21) emphasize that the Jigsaw cooperative learning model fosters responsibility in teaching the material to other group members, increasing learning motivation and boosting students' self-confidence. By implementing this model, students' perseverance in completing tasks is enhanced as they must master the material to teach it to their peers, thus improving their motivation to learn. According to Slavin (Idrus, 2017: 120), the Jigsaw cooperative learning model motivates students to learn because their contribution to the team is based on individual progress, and teams with the highest scores receive certificates or other forms of recognition. This motivates students to learn the material and work diligently within their expert groups, contributing to the team's success. Each individual plays a role in achieving the group's learning goals. Komang et al. (2018: 96-107) note that the Jigsaw cooperative learning model involves students working and learning collaboratively in small groups of four to five, structured with heterogeneity in mind.

Numbered Heads Together (NHT) Cooperative Learning Model

Using appropriate learning models during lessons can foster positive interaction between students and teachers, making students more engaged in the learning process. One alternative cooperative learning model is the Numbered Heads Together (NHT) model. According to Ramadhani et al. (2018: 393-402), the NHT model allows students to share ideas and assess the most accurate answers collaboratively. Kagan (Idrus, 2017: 135) describes the NHT cooperative learning model as one that emphasizes a specific structure designed to shape student interaction patterns and improve their skills. The hallmark of NHT is assigning numbers to students, ensuring that every student has an equal opportunity to demonstrate their understanding. In this model, students comprehend concepts and interact with their peers, express opinions, and participate equally in group presentations. Dadri et al. (2019: 84-93) explain that the NHT model involves splitting students into small groups, where each member is assigned a number. Susilowati (2020: 182-196) further elaborates that NHT involves opportunities for students with the same number across different groups to discuss and respond to questions. Lie (Jumraini, 2018: 653-658) identifies several elements of the NHT cooperative learning model, including (a) positive interdependence, (b) individual accountability, (c) face-to-face interaction, (d) communication among members, and (e) group process evaluation.

Multiple-Choice Test

Ramly & Idrus (2019: 40) define multiple-choice tests as objective test formats consisting of questions or incomplete statements, which students must complete by selecting one or more correct answers from several options. Multiple-choice tests are well-suited for large-scale exams where results must be announced promptly. Multiple-choice questions require test-takers to fill in the blanks based on the provided question or statement stem, accompanied by alternatives. Grounlund & Linn (1990: 166) state that multiple-choice tests can assess various complex topics, encompassing knowledge, understanding, and application. Due to their flexibility and high quality, multiple-choice tests are widely used in multiple types of assessments. Furthermore, Grounlund & Linn (1990: 168) suggest that multiple-choice tests can measure a wide range of

learning outcomes, from simple to complex, and are adaptable to the subject's content. Marrow et al. (2005: 196) describe multiple-choice tests as having two parts: the question stem, which presents a problem or incomplete statement, and two or more potential answers, one of which is correct and the others are distractors. Hopkins & Stanley (1998: 228-231) note that distractors divert the attention of test-takers who are uncertain of the correct answer. Typically, there are four answer choices. An essential skill required for creating practical multiple-choice questions is generating plausible and engaging distractors.

Essay Test

Ramly & Idrus (2019: 45) describe essay tests as assessments requiring students to recall and organize ideas or concepts they have learned, expressing them in written form. The primary characteristic of essay tests is the freedom to express ideas. Students can convey their thoughts using their own words, which makes scoring essay responses challenging and subjective. As a result, essay tests are often referred to as subjective tests. Mehrens & Lehmann (Idrus, 2017: 77) define essay tests as assessments consisting of questions or prompts that require relatively lengthy responses, allowing students to express their thoughts freely. Students do not choose from predetermined answers but instead provide their written responses, with scoring based on the quality of their answers. Mehrens & Lehmann (1984: 102) state that essay tests require students to articulate their answers in writing, with scores awarded based on the quality of their responses. Oosterhorf (1992: 71-72) adds that essay tests tend to assess behavior directly related to the established learning objectives and test students' ability to communicate their ideas in writing. Essay test items require students to formulate responses beyond merely selecting from existing options. Sukardi (2010: 94-95) explains that essay tests are a form of written assessment composed of items that pose problems requiring students to provide solutions. Essay tests are also open-ended tests, in which students are expected to respond based on their knowledge.

Civic Education Learning Outcomes

Kumpas, Eisenschmidt & Veispak (2018: 97) define learning outcomes as the skills, knowledge, or attitudes that students must develop as a result of their learning. Gatti, Ulrich & Seele (2018: 87) state that learning outcomes involve knowledge and skills and values and attitudes that stimulate creative thinking. Zandler & Reile (2018: 132) describe learning outcomes as a complex construct that can only be understood through the interaction of multiple variables. Bloom (Krathwohl & Anderson, 2001: 67-68) categorizes learning outcomes as changes in behavior across three domains: (1) cognitive, (2) affective, and (3) psychomotor.

METHOD

The method used in this study is quasi-experimental with a 2x2 factorial design, as shown in the following table.

Table 2. 2x2 Factorial Experimental Design

Formative Test Type (B)	Cooperative Learning Model (A)	
	Jigsaw (A ₁)	NHT (A ₂)
Essay (B ₁)	(A ₁ B ₁)	(A ₂ B ₁)
Multiple Choice (B ₂)	(A ₁ B ₂)	(A ₂ B ₂)

Sampling was conducted using the cluster random sampling technique with 80 students. The group was taught using the jigsaw cooperative learning model. It was given a multiple-choice formative test (A1B1) consisting of 20 students. In comparison, the group taught using the NHT cooperative learning model and was given a multiple-choice formative test (A1B2) of 20 students. Another 20 students were trained using the Jigsaw cooperative learning model and given an essay-type formative test (A2B1). The final 20 students were taught using the NHT cooperative learning model and given an essay-type formative test (A2B2). The sample was assumed to be homogenous as all students were trained under the same curriculum, in the same semester, in similar learning environments, and were of relatively the same age. The distribution of the sample across treatments is presented in the following table.

Table 3. Sample Distribution by Treatment

Formative Test Type (B)	Cooperative Learning Model (A)		
	Jigsaw (A ₁)	NHT (A ₂)	Sum
High (B ₁)	20	20	40
Low (B ₂)	20	20	40
Total	40	20	80

Hypothesis testing was conducted through analysis of covariance (ANCOVA) using SPSS 22 software with the GLM Univariate procedure. If there is an interaction between treatment and attribute variables, a further t-test ANKOVA will be conducted (Kadir, 2016: 411-455). ANCOVA is a statistical technique used to test the differences in the mean scores of the dependent variable between two or more groups while controlling for one or more covariates. In other words, ANCOVA is used to test differences and is a combination of variance analysis and regression analysis.

RESULTS

Based on the ANCOVA results, the following outcomes were obtained:

Table 4. Parameter Estimates for Factors A, B, AB, and X

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	738.701 ^a	4	184.675	9.203	.000
Intercept	2973.994	1	2973.994	148.207	.000
A	125.591	1	125.591	6.259	.015
B	76.860	1	76.860	4.110	.030
A * B	367.802	1	367.802	18.329	.000
X	86.963	1	86.963	4.334	.041
Error	1504.987	75	20.066		
Total	161109.000	80			
Corrected Total	2243.688	79			

Based on the analysis summarized in Table 4, the first hypothesis was rejected as H₀ with a calculated F-value (F_{hit}) = 6.259 > F_{tab} (1;75) = 3.98. The second hypothesis was also rejected as H₀ with a F_{hit} = 4.110 > F_{tab} (1;75) = 3.98, and the third hypothesis was likewise rejected with a F_{hit} = 18.329 > F_{tab} (1;75) = 3.98.

Since there was an interaction between cooperative learning models and formative test types on Civic Education learning outcomes after controlling for prior ability, follow-up hypothesis testing (one-tailed) was conducted using the t-test ANKOVA. The results for each group comparison are presented in the following table:

Table 5. Parameter Estimates for Hypotheses 4 and 5

Parameter	B	Std. Error	T	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	38.098	2.962	12.864	.000	32.198	43.998	.688
X	.166	.080	2.082	.041	.007	.325	.055
[B=1.00]	-2.481	1.485	-1.670	.099	-5.440	.478	.036
[B=2.00]	0 ^a	.	.	.	.	.	.
[A=1.00] * [B=1.00]	6.834	1.420	4.811	.000	4.004	9.663	.236
[A=1.00] * [B=2.00]	-1.757	1.433	-1.226	.224	-4.613	1.098	.020
[A=2.00] * [B=1.00]	0 ^a	.	.	.	.	.	.
[A=2.00] * [B=2.00]	0 ^a	.	.	.	.	.	.

Based on the analysis in Table 5, for Hypothesis 4, the calculated t-value (t_{hit}) = 4.811 > t_{tab}(1;20) = 1.725, so H₀ was rejected. For Hypothesis 5, H₀ was accepted with a t_{hit} = -1.226 < t_{tab}(1;20) = 1.725.

Table 6. Parameter Estimates for Hypotheses 6 and 7

Parameter	B	Std. Error	T	Sig.	95% Confidence Interval		Partial Eta Squared
					Lower Bound	Upper Bound	
Intercept	38.098	2.962	12.864	.000	32.198	43.998	.688
X	.166	.080	2.082	.041	.007	.325	.055
[A=1.00]	-1.757	1.433	-1.226	.224	-4.613	1.098	.020
[A=2.00]	0 ^a	.	.	.	.	.	.
[A=1.00] * [B=1.00]	6.110	1.455	4.200	.000	3.212	9.008	.190
[A=1.00] * [B=2.00]	0 ^a	.	.	.	.	.	.

[A=2.00] * [B=1.00]	-2.481	1.485	-1.670	.079	-5.440	.478	.036
[A=2.00] * [B=2.00]	0 ^a	.	.	.	.	.	.

Based on the analysis in Table 6, for Hypothesis 6, the calculated t-value (t_{hit}) = 4.200 > $t_{tab}(1;20) = 1.725$, so H_0 was rejected. For Hypothesis 7, H_0 was accepted with a $t_{hit} = -1.670 < t_{tab}(1;20) = 1.725$.

DISCUSSION

The discussion of the hypothesis testing results in this study is as follows:

Hypothesis 1

Based on the analysis of covariance (ANCOVA), it was found that there was a difference in Civic Education learning outcomes after controlling for prior ability between the group of students taught using the Jigsaw cooperative learning model and the group taught using the NHT cooperative learning model. This is indicated by the F-value of 6.259, where prior ability was statistically controlled. The magnitude of the F-value in this hypothesis testing is purely due to the effect of the teaching model provided to the students.

After controlling for prior ability, the results show that the average Civic Education learning outcomes were higher in the group of students taught using the Jigsaw cooperative learning model compared to those taught using the NHT cooperative learning model. From this explanation, it can be concluded that the Jigsaw cooperative learning model more effectively improves Civic Education learning outcomes than the NHT model.

The cooperative learning model plays a positive role in improving Civic Education learning outcomes. According to Lie (2014: 73), the Jigsaw cooperative learning model provides students with numerous opportunities to express their opinions, process information, and enhance communication skills. Group members are responsible for the success of the group, ensuring mastery of the material and effectively conveying information to others. Students involved in the Jigsaw cooperative learning model achieve better academic performance, have more positive attitudes toward learning, and demonstrate greater respect for differing opinions.

Johnson & Johnson (Rusman, 2014: 219) also found that the Jigsaw cooperative learning model has numerous positive effects on children's development, including: 1) improved learning outcomes, 2) enhanced memory retention, 3) development of higher-order reasoning skills, 4) fostering of intrinsic motivation, 5) better relationships among diverse students, 6) increased self-esteem, and 7) development of cooperative life skills.

Students taught using the Jigsaw model tend to be highly motivated to complete the tasks assigned to them, while those taught using the NHT model may avoid lessons with demanding tasks, particularly those that are challenging. The Jigsaw model is aligned with the mastery of Civic Education concepts, which require high levels of critical thinking and analytical skills to solve complex problems. Students taught using the Jigsaw model view obstacles in solving Civic Education problems as challenges that drive them to work harder. These findings indicate that students taught using the Jigsaw model are more likely to improve their Civic Education learning outcomes.

Conversely, students taught using the NHT model tend to give up easily when they perceive their goals as difficult to achieve due to a lack of confidence in their abilities to overcome challenges. As a result, they are less able to optimize their Civic Education learning outcomes.

Hypothesis 2

The analysis of covariance (ANCOVA) found that Civic Education learning outcomes, after controlling for prior ability, were higher for students given essay-type formative tests compared to those given multiple-choice formative tests. This is indicated by an F-value of 4.110. The magnitude of the F-value in this

hypothesis testing is purely due to the effect of the formative test type provided to the students, as prior ability has been statistically controlled.

These results suggest that the treatment involving essay-type tests in this study was effective in improving Civic Education learning outcomes. The effectiveness of essay tests in Civic Education was also demonstrated in research by Sumantri and Satriani (2016: 507-524), which found that students who took essay-type formative tests achieved higher scores than those who took multiple-choice formative tests.

Further discussion of these findings highlights the role of essay-type tests in shaping Civic Education learning outcomes. According to Oosterhof (1996: 89-90), essay tests tend to measure behaviors directly related to the learning objectives, assess the ability to communicate ideas in writing, and require students to respond by simply selecting predefined answers. Essay tests specifically demand that students organize their ideas and demonstrate reasoning skills, which aligns with Gronlund's (1982: 119) assertion that essay tests offer students the freedom to answer questions in their way, requiring them to organize and present their responses in a structured and thoughtful manner.

In other words, essay tests are well-suited for measuring higher-order cognitive skills in Civic Education, as emphasized by Wieresma and Jurs (1990: 72), who note that essay tests have the potential to assess more complex learning outcomes, providing students with the opportunity to organize, analyze, and synthesize ideas and articulate them in a structured and organized manner.

Teachers who use essay questions expect students to respond according to their abilities, often requiring extended written explanations that reveal the students' thought processes. These assessments can identify the final answers and the reasoning, background, and logic behind the responses. The students' personalities and character traits may be inferred from their written responses.

The main characteristics of essay-type formative tests align with the mastery of Civic Education. In studying civic education, students are expected to engage in complex thinking and critical analysis, which require reasoning skills. Civic Education results from human thought processes related to ideas, methods, and reasoning.

Answering essay questions in Civic Education requires complex thinking. Students must draw upon factual knowledge, evaluate the facts they know, and then organize them into a logical, argumentative narrative using their language. The ability to create narratives in their own words reflects a high level of cognitive development. Therefore, the complexity of essay responses encompasses various levels of ability.

The above discussion indicates that essay tests stimulate students to engage in complex thinking and help them identify which parts of the material they have yet to master. This allows for corrections and revisions in their learning process. Consequently, essay tests positively impact the improvement of Civic Education learning outcomes.

The same cannot be said for multiple-choice tests. According to Oosterhof (1998: 86-89), one of the weaknesses of multiple-choice tests is that students may guess the answers. Multiple-choice tests are not aligned with the nature of Civic Education learning, which emphasizes reasoning processes. In multiple-choice tests, students merely choose from pre-existing answers rather than offering their ideas or opinions, which limits their ability to develop creative and critical thinking skills. The format requires students only to select the correct answer from the available options, increasing the likelihood of guessing.

Therefore, multiple-choice tests are less effective in improving Civic Education learning outcomes. The continued use of multiple-choice tests in classrooms may not be appropriate, as they do not allow students to identify their weaknesses in answering Civic Education questions.

Hypothesis 3

Based on the analysis of covariance (ANCOVA) conducted in this study, it was found that there is a significant interaction effect between the use of cooperative learning models and formative test types on Civic

Education learning outcomes after controlling for students' prior abilities. This is indicated by an F-value of 18.329. After controlling for prior ability, the F-value is purely the result of the treatment effect.

These findings align with the theory of cooperative learning models and formative test types. Cooperative learning models and formative test types are two factors that determine Civic Education learning outcomes. However, to achieve optimal outcomes, there needs to be alignment between the cooperative learning model and the appropriate test type tailored to the context and situation.

Students who receive essay tests tend to enjoy and feel challenged by learning Civic Education, as essay tests require them to answer questions step by step according to the concepts posed in the questions. Students taught using the Jigsaw cooperative learning model tend to be more effective in overcoming difficulties, persistently correcting mistakes, and more inclined to increase their efforts to achieve success. Thus, students taught using the Jigsaw model are well-suited to receiving essay tests, as they are confident in their abilities, which ultimately positively impacts their learning outcomes. In contrast, students taught using the Jigsaw model may not perform as well when given multiple-choice tests.

On the other hand, students taught using the NHT model may lack confidence in their abilities, give up easily when faced with complex tasks, and are more likely to complete tests presented in multiple-choice format. In multiple-choice tests, students select the answer they believe is correct from several options, which can help them achieve the learning objectives. However, students taught using the NHT model may not perform as well when given essay tests.

Considering the nature of the cooperative learning models, it is highly likely that students taught using the Jigsaw model will achieve higher learning outcomes when given essay tests, while those taught using the NHT model will perform better when given multiple-choice tests. Therefore, this study found an interaction effect between cooperative learning models and formative test types on Civic Education learning outcomes after controlling for prior ability.

Hypothesis 4

The analysis of covariance (ANCOVA) revealed that for students given essay-type formative tests, there was a significant difference in Civic Education learning outcomes, after controlling for prior ability, between the group of students taught using the Jigsaw cooperative learning model and the group taught using the NHT model. This is indicated by a t-value of 4.811. The t-value generated in this study is purely controlled for the effect of prior ability. In other words, the average Civic Education learning outcomes were not influenced by the previous ability variable. Still, they were instead due to the essay test administered to students taught using either the Jigsaw or NHT models.

Further testing revealed that for students given essay tests, the Civic Education learning outcomes, after controlling for prior ability, were higher in the group taught using the Jigsaw cooperative learning model compared to the group taught using the NHT model. This indicates that the Jigsaw model was more effective in improving Civic Education learning outcomes for students who were given essay-type formative tests.

These results align with the effects of cooperative learning models and formative test types. When the collaborative learning model is linked to the formative test type used during the learning process, essay tests are particularly effective because they demand student independence and confidence in expressing opinions and the ability to analyze complex Civic Education questions.

The key advantage of essay tests is their ability to provide better Civic Education learning outcomes by allowing students the freedom to express their answers and measure more complex responses. Popham (1981: 123) explained that essay tests are appropriate for assessing complex learning outcomes, as they reveal how well students can compose their own written responses. Marrow (2005: 196-204) argued that essay tests are highly effective for assessing organizational, analytical, and evaluative abilities compared to other types of tests. Essay tests can effectively measure the opinions and attitudes of test-takers.

This requires high-level thinking and expression skills. Several characteristics of essay-type formative tests are well-suited to students taught using the Jigsaw model. These students enjoy challenges and demonstrate a

strong interest in solving Civic Education problems. They increase their efforts when previous actions have failed to achieve the desired outcome, identify the causes of failure, and experience little anxiety when facing Civic Education questions. Ultimately, these students experience lower stress levels. Thus, essay tests can enhance civic education learning outcomes for students who are taught using the Jigsaw model.

In contrast, students taught using the NHT model are likelier to avoid tasks they perceive as complex, are less motivated to work harder, and tend to give up easily when faced with obstacles.

The above findings indicate that, specifically for students given essay tests, Civic Education learning outcomes, after controlling for prior ability, were higher in the group taught using the Jigsaw cooperative learning model compared to the group taught using the NHT model.

Hypothesis 5

The results of hypothesis 5 testing show that H_0 is accepted based on the t-test statistic, with a t-value of -1.226, smaller than the critical t-value of 1.725. The t-value generated in this study was purely controlled for the effect of prior ability.

These results indicate that, after controlling for prior ability, there was no difference in civic education learning outcomes between the group of students taught using the Jigsaw cooperative learning model and the group taught using the NHT model when both groups were given multiple-choice tests. This suggests that neither the Jigsaw nor the NHT cooperative learning models effectively improved Civic Education learning outcomes when paired with multiple-choice tests.

This result may be due to various factors, including the nature of multiple-choice tests. According to Oosterhof (1981: 86-89), one of the weaknesses of multiple-choice tests is that students may guess the answers. Multiple-choice tests are not well-suited to Civic Education learning, which involves reasoning processes. Gronlund and Linn (1982: 119-174) explained that one of the weaknesses of multiple-choice tests is that students may guess the correct answer rather than engage in critical thinking.

Using formative tests aims to help teachers monitor student learning outcomes during the learning process. However, multiple-choice tests are not well-suited for monitoring or providing insight into how well students have developed their abilities. In multiple-choice tests, students choose one answer from the available options without explaining their reasoning step by step. This prevents teachers from identifying students' strengths and weaknesses during the learning process and hinders their ability to diagnose what students have or have not learned.

Therefore, multiple-choice tests are less effective in improving Civic Education learning outcomes. The continued use of multiple-choice tests in the classroom may not be appropriate, as they do not provide students with opportunities to identify their weaknesses in answering Civic Education questions.

Hypothesis 6

The results of hypothesis 6 testing showed that H_0 was rejected based on the t-test statistic, with a t-value of 4.200, greater than the critical t-value of 1.725 at the 0.05 significance level with 20 degrees of freedom. The t-value produced in this study was statistically controlled for the effect of prior ability.

The hypothesis testing using analysis of covariance (ANCOVA) found that, for students taught using the Jigsaw cooperative learning model, Civic Education learning outcomes, after controlling for prior ability, were higher for students who were given essay-type formative tests compared to those given multiple-choice tests. This indicates that the essay tests administered to students taught using the Jigsaw cooperative learning model can enhance Civic Education learning outcomes.

The calculation results show that compared to the group of students taught using the Jigsaw cooperative learning model, Civic Education learning outcomes were higher for students given essay tests than for the group given multiple-choice tests. These findings are consistent with the concept of Civic Education. Students taught using the Jigsaw cooperative learning model tend to believe they can achieve success by

exhibiting behavior aligned with the desired learning objectives, which fosters individual engagement in learning activities and supports the development of Civic Education outcomes. Students taught using the Jigsaw model are generally more prepared, consistent, and motivated to face challenging tasks because they trust their abilities and strive for higher achievement.

On the other hand, studying civic education requires strong reasoning and critical thinking skills based on logical, necessary, and rational thinking, which are essential for solving complex essay-type questions with a high degree of difficulty. According to Wieresma & Jurs (1990: 72), essay tests effectively measure higher-order learning outcomes such as analysis, synthesis, and evaluation. Given this, administering essay tests requires students to have high confidence and independence in expressing their opinions and reasoning through difficult questions. Essay questions provide a platform for students to tackle challenging Civic Education problems. Thus, students taught using the Jigsaw cooperative learning model with essay tests are expected to achieve optimal Civic Education learning outcomes.

In contrast, multiple-choice tests require students to select the correct answer from the options provided. This introduces an element of chance in answering the questions, potentially reducing students' motivation to face challenges. As a result, administering multiple-choice tests to students taught using the Jigsaw cooperative learning model may lead to suboptimal Civic Education learning outcomes.

Hypothesis 7

The results of hypothesis 7 testing show that H_0 was accepted based on the t-test statistic, with a t-value of -1.670, smaller than the critical t-value of 1.725 at the 0.05 significance level with 20 degrees of freedom. The t-value produced in this study was statistically controlled for the effect of prior ability.

The hypothesis testing found that, for students taught using the NHT cooperative learning model, there was no significant difference in Civic Education learning outcomes, after controlling for prior ability, between the group of students given essay tests and the group given multiple-choice tests. This means that the treatments administered to students taught using the NHT cooperative learning model did not improve Civic Education learning outcomes, regardless of whether they were given essay or multiple-choice tests.

Fatigue may have been a factor for students in the NHT model group, regardless of whether they were given essay or multiple-choice tests, as they may have felt overwhelmed by the number of questions. Although the number of questions was adjusted to fit the time available, students taught using the NHT model tend to avoid tasks they perceive as complex, are less inclined to put in additional effort and give up easily when faced with challenges, which ultimately affects their ability to achieve optimal Civic Education learning outcomes.

Another possible factor for the lack of difference in Civic Education outcomes between students given essay tests and those given multiple-choice tests in the NHT group is the effectiveness of the formative test type used. According to Hopkins and Antes (1979: 96), one weakness of essay tests is that students often struggle to communicate their ideas in writing, even though the ability to articulate thoughts is a critical factor that differentiates student performance. Essay tests require students to organize their learned ideas and express them in written form. Essay tests may be tough for students taught using the NHT cooperative learning model, as they tend to avoid tasks that require extensive writing and often lack persistence in answering challenging Civic Education questions that require reasoning.

In addition, Hopkins & Antes (1979: 96) also pointed out that essay tests have a limited scope of content coverage. This limitation may affect students' readiness to master all the material, leading students in the NHT group to speculate about what content will be tested in the formative assessment. These conditions may contribute to less-than-optimal Civic Education learning outcomes.

Further consideration should be given to the Civic Education learning outcomes of students taught using the NHT model and given multiple-choice tests. According to Nitko (2001: 3), one weakness of multiple-choice tests is that students may guess the correct answer, as all possible answers are provided, and they are not required to organize their thoughts in a structured, step-by-step manner. For teachers, multiple-choice test results may not accurately reflect students' abilities, as they do not reveal students' thought processes. In other

words, since students are only required to choose from predetermined answers, multiple-choice tests do not allow students to demonstrate their ability to integrate their thoughts. This makes it difficult for teachers to identify students' overall progress, determine which aspects of civic education require further reinforcement or remedial instruction, and determine when students are ready to move on to new material. Therefore, the use of multiple-choice tests in Civic Education may not be effective and could result in suboptimal learning outcomes.

Furthermore, multiple-choice tests do not accurately reflect students' abilities, as they do not offer opportunities for students to express their thoughts and ideas in a systematic and step-by-step manner in line with Civic Education principles. Multiple-choice tests, which focus on identifying the correct answer, do not assess other cognitive abilities that students may possess. As a result, students taught using the Jigsaw model may not be motivated to improve and enhance their learning outcomes. Consequently, administering multiple-choice tests to students taught using the Jigsaw cooperative learning model may result in suboptimal Civic Education learning outcomes.

CONCLUSION

Using cooperative learning models and formative test types can improve Civic Education learning outcomes after controlling for prior ability. Specifically, essay-type formative tests are more appropriate for students taught using the Jigsaw cooperative learning model, while for students taught using the NHT cooperative learning model, multiple-choice tests are more suitable. Therefore, teachers must improve their teaching skills, particularly by using cooperative learning models, as both models can enhance civic education learning outcomes. Teachers must also expand their knowledge of formative test types, particularly essay and multiple-choice tests, in Civic Education instruction.

REFERENCES

- Acharya, Bed Raj. (2017). Factors Affecting Difficulties in Learning Mathematics by Mathematics Learners”, *International Journal of Elementary Education*, Volume 6(2), pp.1-11.
- Dadri, P. C. W., Dantes, N., & Gunamantha, I. M. (2019). Pengaruh Model Pembelajaran Kooperatif Tipe NHT Terhadap Kemampuan Berpikir Kritis dan Hasil Belajar Matematika Siswa Kelas V SD Gugus III Mengwi, *PENDASI: Jurnal Pendidikan Dasar Indonesia*, 3(2), pp.84-93.
- Dick, Walter & Carey, Lou. (2005). *The Systematic Design of Instructional*. Boston: Pearson, p.87.
- Falk, John H. dan Leslie, M. Adelman. (2013). Investigating The Impact of Prior Knowledge and Interest on Aquarium Visitor Learning, <http://eec.islandwood.org/files/clancyw> (diakses 26 Februari 2022), p.70.
- Gatti, Lucia, Ulrich, Markus & Seele, Peter. (2018). Education For Sustainable Development Through Business Simulation Games: An Exploratory Study of Sustainability Gamification And Its Effects On Students' Learning Outcomes. *Journal of Cleaner Production*, 2(5), p.87.
- Gronlund, Norman E., & Linn, Robert L., (1982). *Constructing Achievement Test* (London: Prentice-Hall Inc., pp.119-174.
- Gronlund, Norman E., & Robert L. Linn. (1998). *Measurement and Evaluation in Teaching*. New York: MacMillan Publishing Company, pp.166-168.
- Hailikari, Telle. (2009). *Assessing University Students' Prior Knowledge; Implication for Theory and Practice*,” Research Report. University of Helsinki Departement of Education, p.102.
- Hopkins, Charles D., & Antes, Richard L. (1979). *Classroom Testing: Construction*. Illinois: FE. Peacock Publisher, Inc., p.96.
- Hunter, William C, et, al., (2015). Numbered Heads Together as a Tier 1 Instructional Strategy in Multitiered Systems of Support, *International Journal Education and Treatment of Children, USA: The University of Memphis*, 38(3), pp.345-362.
- Idrus, Muhammad (2017). Pengaruh Model Pembelajaran Kooperatif dan bentuk Tes Formatif Terhadap Hasil Belajar PKn Dengan Mengontrol Kemampuan Awal (Eksperimen Pada Siswa Kelas VII SMP Negeri 5 Kendari). *Disertasi PPs Universitas Negeri Jakarta*, p.135.
- Jumraini. (2018). Penerapan Model Pembelajaran Kooperatif Tipe Numbered Heads Together (NNT) Untuk Meningkatkan Hasil Belajar Ekonomi Siswa Kelas XI SMA Negeri 5 Pekanbaru. *Jurnal PAJAR (Pendidikan dan Pengajaran) Program Studi Pendidikan Guru Sekolah Dasar FKIP Universitas Riau*, 2(4), p.653-658.
- Kadir. (2016). *Statistika Terapan, Konsep, contoh dan Analisis Data dengan Program SPSS/Lisrel dalam Penelitian*. Jakarta: Rajawali Pers, pp.411-455.
- Kelly, S., Olney, A. M., Donnelly, P., Nystrand, M., & D'Mello, S. K., (2018). Automatically Measuring Question Authenticity in Real-World Classrooms. *Educational Researcher*, 47(7), pp.451-464.
- Komang, N., Yunita, D., Ketut, N., Trisiantari, D., Dasar, J. P., & Ganesha, U. P. (2018). Pengaruh Model Pembelajaran Kooperatif Tipe TGT Berbasis Kearifan Lokal Tri Hita Karana Terhadap Hasil Belajar, 1(2), pp.96-107.

- Krathwohl, David R, Bloom, Benjamin S., & Masia, Bertram B., (2001). Taxonomi of Educational Objectives The Classificational of Educational Goals. Hnadbook II: The Affective Domain. New York: David McKay, pp.67-68.
- Kumpas-Lenk, Kaija, Eisenschmidt, Eve & Veispak, Anneli. (2018). Does the Design of Learning Outcomes Matter From Students' Perspective?”, *Studies in Educational*, p.97.
- Lie, Anita. (2014). *Cooperative Learning*. Jakarta: PT. Gramedia Widiasarana Indonesia, p.73.
- Mahrens, W. A. & Lehmann, I. J. (1984). *Measurement and Evaluation in Education and Psychology*. New York: Holt, Rinehart and Winston. p.102.
- Marrow, James R, Jr et.al. (2005). *Measurement and Evaluation In Human Performance, USA: Human Kinetics*, pp.196-204.
- Nitko, J, Anthony. (2001). *Educational Assessment of Student*, New Jersey: Prentice-Hall, p.3.
- Oosterhorf, Albert. (1996). *Developing and Using Classroom Assessments*. New Jersey: Prentice Hall, pp.86-89.
- Orlich, Donald C., et.al. (2013). *Teaching Strategies A Guide to Effective Instruction*. Belmont: Wadsworth, p.132.
- Popham, W. James, (1981). *Educational Measurement*. New Jersey: Prentice Hall, 1981, p.123.
- Ramadhani, Febrina, Triyanto & Kurniawati, Ida. (2018). Penerapan Model Pembelajaran Kooperatif Tipe Numbered Heads Together (NHT) dengan Pendekatan Open-Ended untuk Meningkatkan Aktivitas Belajar dan Pemahaman Konsep pada Materi Persamaan Garis Lurus. *Jurnal Pendidikan Matematika dan Matematik (JPPM)*. Universitas Negeri Surakarta, 2(5), pp.393-402.
- Ramly & Idrus, Muhammad. (2019). *Evaluasi Pembelajaran*. Bandung: Mujahid Press, pp.40-45.
- Rokot, Agus. (2016). The Influence Of Cooperative Learning Model And Formative Test Toward The Chemistry Learning Achievement By Controlling The Initial Competency. *International Journal of Health Medicine and Current Research*, 1(2), Indonesia, pp.217-225.
- Simaremare, Juni Agus & Theosalonika, Emelda. (2021). Penerapan Metode Cooperative Learning Tipe Jigsaw untuk Meningkatkan Motivasi dan Hasil Belajar Mahasiswa. *Jurnal Tunas Bangsa*, Universitas HKBP Nommensen Pematangsiantar, 8(2), pp.1-21.
- Sukardi. (2010). *Evaluasi pendidikan Prinsip dan Operasionalnya*. (Jakarta: Bumi Aksara, pp. 94-95.
- Sumantri, Mohamad Syarif & Satriani, Reni. (2016). The Effect of Formatif Testing and Self-Derected Learning on Mathematics Learning Outcomes. (IEJEE, *Internasional Electronic Journal of Elementary Education*, Jakarta state University, Indonesia, 8(3): pp.507-524.
- Susilowati, Eka. (2020). Pengaruh Model Pembelajaran Kooperatif Tipe NHT With Random Name Number Terhadap Hasil Belajar Mahasiswa Pada Materi Aljabar Elementer. *MUST: Journal of Mathematics Education, Science and Technology*. Universitas PGRI Adi Buana Surabaya, 5(2), pp.182-196.
- Rusman. (2014). *Model-Model Pembelajaran: Mengembangkan Profesionalisme Guru*. Jakarta: Raja Grafindo Persada, p.219.
- Wieresma, William dan Jurs, Stephen G. *Educational Measurement and Testing*. Boston: Allyn and Bacon, 1990, p.72.
- Zendler, Andreas & Reile, Swetlana. (2018). The Effect of Reciprocal Teaching and Programmed Instruction on Learning Outcome in Computer Science Education”, *Studies in Educational Evaluation*, p.132.