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The Role of Numbered Heads Together in Developing 21st-Century Skills in Civic Education: Evidence from Indonesian Junior High School Students

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ABSTRACT

21st-century learning emphasizes the development of collaboration and communication skills, especially in Civic Education (PPKn). This study examines the impact of the Numbered Heads Together (NHT) cooperative learning model on enhancing these skills among Grade VIII students at SMP Negeri 8 Sungai Penuh. A quantitative approach with a quasi-experimental, posttest-only control group design was employed. A total of 64 students were selected through purposive sampling and divided evenly into an experimental group (NHT model) and a control group (conventional discussion). Collaboration skills were assessed using observation sheets, while communication skills were evaluated through a structured group presentation rubric. Independent sample t-tests were used for data analysis. The experimental group demonstrated significantly higher collaboration (82.3%) compared to the control group (76.59%). The t-test results confirmed a statistically significant difference in collaboration skills ($t = 2.352$, $p = 0.022$). Similarly, communication skills in the experimental group were significantly improved ($t = 2.597$, $p = 0.001$), indicating the effectiveness of the NHT model in fostering interpersonal competencies. These findings support constructivist and social learning theories, which emphasize active participation and peer interaction. The NHT model facilitates a collaborative learning environment that promotes student engagement and improves communication fluency and group cooperation. The NHT model is effective in improving students' collaboration and communication skills in PPKn learning. Its integration into classroom practice is recommended to support the development of essential 21st-century skills in secondary education.

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1. INTRODUCTION

The Indonesian national education curriculum has experienced multiple revisions aimed at improving its responsiveness to global educational demands and the holistic development of learners. These changes are intended to meet the fundamental learning needs of students and prepare them to

become visionary individuals capable of adapting to rapid socio-cultural and technological transformations (Ministry of Education, Culture, Research, and Technology [Kemendikbudristek], 2022). One of the most recent reforms is the implementation of the Merdeka Curriculum, which emphasizes flexibility, character education, and the cultivation of student competencies through contextual and participatory learning approaches (Mulyasa, 2023).

Within the framework of Pendidikan Pancasila dan Kewarganegaraan (PPKn or Pancasila and Civic Education), the Merdeka Curriculum promotes an interactive pedagogical model that encourages active student participation, critical thinking, and democratic dialogue. These elements are seen as essential for the formation of responsible, engaged, and intelligent citizens (Hasanah et al., 2021). As such, the alignment of teaching strategies with curriculum goals becomes imperative. The curriculum not only outlines the competencies to be achieved but also serves as a guide for designing learning experiences that promote meaningful engagement and character development (Bakhrudin et al., 2021).

To support these objectives, educators must implement instructional models that align with the curriculum's emphasis on student-centered learning. Among the various cooperative learning models, the Numbered Heads Together (NHT) strategy has emerged as a promising approach for enhancing student engagement, particularly in civic education (Wiratman, 2023). The NHT model encourages group collaboration in which every student is held accountable for contributing to group discussions and problem-solving tasks, making it a suitable method for fostering essential 21st-century skills such as communication and collaboration.

Research has shown that NHT is effective in cultivating interpersonal competencies among students. It facilitates the development of communication skills through structured group discussions, enabling students to articulate ideas, listen actively, and evaluate different perspectives (Wulandari et al., 2023). In this model, teachers act as facilitators who guide students in constructing knowledge, solving problems, and participating meaningfully in collaborative learning environments (Hetharion, 2023).

The NHT strategy also enhances students' ability to work cooperatively by encouraging shared responsibility and respect for individual roles within group activities. It helps students internalize concepts such as task delegation, equitable contribution, and constructive feedback, all of which are crucial for collaborative success (Ramlah, 2021). Moreover, the process of sequential idea-sharing and collective problem-solving nurtures students' communication fluency and social competence (Yandi et al., 2023). According to Yustika et al. (2019), these activities not only build communication skills but also promote empathy, tolerance, and mutual respect—key attributes of democratic citizenship.

This alignment between pedagogical method and curriculum goals becomes especially significant in the context of PPKn, where the focus extends beyond cognitive development to include moral and civic character. The use of collaborative learning models like NHT supports the development of responsible citizens who are capable of democratic engagement, social cooperation, and critical reasoning (Pardoan et al., 2022).

Communication and collaboration are two foundational competencies in 21st-century education. Communication involves not only the ability to convey thoughts effectively through speaking, writing, reading, and listening, but also the capacity to engage in meaningful interpersonal interactions (Alahmad et al., 2021). Collaboration, meanwhile, encompasses the ability to work productively with others in diverse and inclusive learning environments. As noted by Zamora (2022), modern educators must foster these competencies while integrating problem-solving, digital literacy, and creativity into their teaching practices.

In the context of PPKn, collaboration is particularly vital, as students are expected to explore civic issues, deliberate on different viewpoints, and work together in resolving community-based problems (Kharomah et al., 2023). Effective implementation of NHT in PPKn can, therefore, contribute to creating a dynamic learning atmosphere in which students not only acquire academic knowledge but also practice civic virtues such as cooperation, dialogue, and shared responsibility (Asep et al., 2023).

Despite the potential benefits, field observations conducted at SMP Negeri 8 Sungai Penuh reveal that many students exhibit underdeveloped collaboration and communication skills. During preliminary classroom observations, students in the eighth grade displayed difficulties in working effectively as a group, with unequal task distribution and limited participation from some members. Dominant students often overshadowed others, while those less confident were passive and disengaged. Furthermore, disagreements often arose due to a lack of appreciation for differing opinions, leading to tension and reduced group cohesion.

The results of these initial observations indicate a low level of collaborative competence, with only 37.52% of students demonstrating adequate skills. Similarly, communication skills were also insufficiently developed, with just 37.53% of students showing proficiency, leaving 62.47% struggling to engage meaningfully in discussion and interaction. These findings underscore the urgent need to adopt pedagogical strategies that more effectively develop students' social and interpersonal skills, particularly in the civic education domain.

In response to these challenges, the adoption of the NHT model presents a promising solution. Its structured group format promotes active participation, mutual accountability, and democratic interaction, thereby addressing the observed deficits in communication and collaboration. According to Hutapea et al. (2023), the NHT approach requires each student to contribute within a small group, ensuring that all voices are heard and respected, which in turn boosts student confidence, understanding, and social engagement.

Further supporting this need, Urbani et al. (2017) argue that educational institutions must not only teach collaboration and communication as discrete skills but must embed them within the learning process through regular modeling, assessment, and feedback. In this way, students learn to internalize these competencies as part of their academic and civic development.

While previous research has largely focused on applying the NHT model in science-related subjects such as Mathematics and Biology (Aulia, 2024; Palennari et al., 2021; Wanah et al., 2020), its application in PPKn remains limited. Additionally, most studies were conducted under the 2013 Curriculum, which differs in emphasis and structure from the more recent Merdeka Curriculum. The present study is conducted at a site not previously studied—SMP Negeri 8 Sungai Penuh—and utilizes assessment instruments such as observation sheets and structured rubrics to objectively evaluate collaboration and communication skills. This approach offers a novel contribution to the literature, particularly in the context of character-based civic education under the Merdeka framework.

To address the identified gaps, the following research questions are proposed:

1. Is there a significant difference in collaboration skills between students taught using the NHT model and those taught using conventional methods in PPKn learning in the eighth grade at SMP Negeri 8 Sungai Penuh?
2. Is there a significant difference in communication skills between students taught using the NHT model and those taught using conventional methods in the same context?

Accordingly, this study aims to examine whether the implementation of the NHT cooperative learning model significantly improves students' collaboration and communication skills compared to conventional teaching approaches in PPKn learning at SMP Negeri 8 Sungai Penuh.

2. METHODS

2.1. Research Method

This study employs a quantitative approach using a quasi-experimental design, specifically the *Posttest Only Control Group Design*. This design was chosen because it allows the researcher to assess the effect of an intervention without administering a pre-test beforehand. It is commonly used in experimental research to evaluate the effectiveness of specific methods or treatments (Sugiyono, 2019). The primary objective of this research is to examine how the application of the Numbered Head

Together (NHT) cooperative learning model influences students' collaboration and communication skills within the context of Civic Education (PPKn) learning at SMP Negeri 8 Sungai Penuh.

2.2. Research Site and Sample

The study was conducted at SMP Negeri 8 Sungai Penuh, with the research subjects being eighth-grade students. The sampling technique used was purposive sampling, and two classes were selected: Class VIII-F as the experimental group applying the NHT model, and Class VIII-G as the control group using the conventional discussion method. Each class consisted of 32 students. The research was carried out over four sessions for each group, where the NHT model was implemented in the experimental group, and traditional discussion was applied in the control group.

2.3. Data Collection Techniques and Instruments

The instruments used to collect data included observation sheets designed to assess students' collaboration skills using a detailed scoring rubric. Additionally, a presentation rubric was utilized to evaluate students' communication skills during classroom discussions. Supporting data were also gathered through documentation, such as photographs, written notes, and teaching materials used during the learning process.

A validity test was conducted with the assistance of a subject-matter expert to ensure the validity of the instruments. The results showed that all items were valid, with correlation coefficients (r-count) exceeding the critical value (r-table = 0.361). There were 10 assessment indicators for collaboration and another 10 indicators for communication, all of which met the validity criteria. Furthermore, reliability testing using Cronbach's Alpha showed values of 0.807 for the collaboration variable (X1) and 0.773 for the communication variable (X2), both of which are above the acceptable threshold of 0.60. These results indicate that the observation sheets used in this research were reliable and consistent.

2.4. Data Analysis Techniques

The data analysis in this study was carried out in two main stages: descriptive statistical analysis and inferential statistical analysis. Descriptive analysis was conducted to provide a general overview of the observed data on students' collaboration and communication skills. The data were processed using Microsoft Excel to identify patterns and trends that emerged during the learning sessions. Subsequently, inferential statistical analysis was conducted using SPSS version 30. This included a normality test using the Kolmogorov-Smirnov method to determine whether the data were normally distributed, and a homogeneity test using Levene's Test to assess the equality of variances between the groups. Finally, an Independent Samples t-Test was conducted to test the research hypotheses and determine whether there were significant differences between the experimental and control groups. In addition, Cohen's d was calculated to measure the effect size of the difference between the two groups.

The sample used in this study, namely the students of classes VIII-F and VIII-G at SMP Negeri 8 Sungai Penuh, reflects the target population, which is the eighth-grade students at the school. This is because both classes are in the same educational environment, are taught by the same teacher, use the same teaching methods, have an equal number of students, and based on observations, both classes demonstrated low collaboration and communication skills. Additionally, they follow the same curriculum. The selection of these two classes ensures that the findings of the study can be reasonably generalized to the overall population of eighth-grade students at the school, particularly in the context of Civic Education (PPKn) learning.

3. FINDINGS AND DISCUSSION

This section presents the research findings on the effect of the Numbered Head Together (NHT) cooperative learning model on students collaboration and communication skills. The data obtained were meticulously analyzed using various statistical methods to assess the extent of the impact of the

applied learning model on students performance. These analyses aimed to provide clear, measurable insights into how the NHT model influenced the students ability to work collaboratively and communicate effectively with their peers. The research results are presented through both descriptive and inferential analyses to offer a comprehensive overview of the outcomes, highlighting both the observed trends and the statistical significance of the findings. Descriptive analysis provides a summary of the general patterns and behavior observed in the data, while inferential analysis allows for drawing conclusions about the broader impact of the learning model across the population studied. To ensure clarity and precision in understanding the results, the findings are organized and displayed in the following table, which presents a detailed breakdown of the data and supports the conclusions drawn in this research:

3.1 Observation Results of Collaboration in the Experimental Class

This observation was conducted to assess the implementation of the Numbered Heads Together (NHT) cooperative learning model in the experimental class. The assessment was carried out by an observer using an observation sheet during the learning process over four sessions. The observation results are presented in the table below:

Table 1. Percentage of Student Observation Data on Collaboration Skills in the Experimental Class

No	Assessment Aspects	Meeting				Average	Category
		1	2	3	4		
1	Proposing ideas or contributions in discussions.	78.5%	80.2%	82.3%	83.7%	81.2%	Very High
2	Engaging in every group activity.	75.8%	78.6%	80.9%	85.9%	80,3%	High
3	Completing tasks on time.	79.2%	81.3%	83.0%	82.5%	81.5%	Very High
4	Fulfilling assigned roles within the group.	77.9%	79.8%	81.5%	80%	79.8%	High
5	Accepting others opinions or ideas.	80.1%	83.2%	85.3%	86.8%	83.9%	Very High
6	Adapting to changes in group situations.	78.6%	80.5%	82.7%	82.5%	81.1%	Very High
7	Collaborating effectively to achieve group goals.	77.5%	79.7%	81.9%	80.6%	79.9%	High
8	Distributing tasks fairly among group members based on their abilities.	81.3%	84.0%	86.1%	86.2%	84.4%	Very High
0	Listening attentively to others opinions.	79.7%	81.8%	83.5%	83.1%	82.0%	Very High
10	Respecting the turn to speak without interrupting.	78.0%	83.2%	88.5%	95%	86.2%	Very High
Overall Average		**82.3% (Very High)**					

Based on the observations conducted by the observer over four sessions, the The implementation of the cooperative learning model Numbered Head Together (NHT) in the experimental class revealed that students' collaboration skills were categorized as very high, with an overall average percentage of 82.3%. This finding suggests that the students in the experimental class demonstrated a strong ability to collaborate effectively during the learning process. The observation data indicates that the Numbered Head Together (NHT) model significantly influenced the students collaboration skills, as most students fell into the very high category, showing a clear positive impact on their ability to work together. The results point to the effectiveness of the NHT model in promoting a collaborative learning environment that fosters active participation and teamwork among students.

3.2 Observation Results of Collaboration in the Control Class

This observation was conducted to evaluate the implementation of the discussion method in the control class and to analyze its impact on students learning experiences. The assessment was systematically carried out by the observer using a structured observation sheet during the learning process over four sessions. The collected observation data and findings are summarized and presented in the table below:

Table 2. Percentage of Student Collaboration Skills Observation Data in the Control Class

No	Assessment Aspects	Meeting				Average	Category
		1	2	3	4		
1	Proposing ideas or contributions in discussions	72%%	78%%	80%%	83%	78.3%	High
2	Engaging in every group activity.	74%%	79%%	82%%	83.6%	79.9%	High
3	Completing tasks on time..	69%%	75%%	78%%	78.6%	75.2%	High
4	Fulfilling assigned roles in the group	76%%	82%%	84%%	85%	81.8%	Very High
5	Accepting others opinions or ideas.	71%%	76%%	79%%	81.8%	76.9%	High
6	Adapting to changes in group situations	68%%	73%%	76%%	77.4%	73.6%	High
7	Collaborating effectively to achieve group goals	70%%	75%%	78%%	81.2%	76.1%	High
8	Distributing tasks fairly among group members according to their abilities	72%%	77%%	80%%	82.4%	77.9%	High
9	Listening attentively to others opinions	66%%	72%%	74%%	75.6%	71.9%	High
10	Respecting turns to speak without interrupting	68%%	74%%	77%%	78%	74.3%	High
Overall Average		**76.59% (High)**					

Based on the observations conducted over four sessions, the implementation of the discussion method in the control class showed that students collaboration skills were categorized as high, with an overall average of 76.59%. This indicates that, while students collaboration skills using the discussion method were fairly good and fell within the high category, they were still relatively lower compared to the experimental class that applied the Numbered Head Together (NHT) model. The results suggest that, although the discussion method promoted a certain level of collaboration, it did not reach the same level of effectiveness in fostering teamwork and cooperation as the NHT model did. The findings highlight the potential benefits of using cooperative learning models like NHT over traditional methods such as discussions for improving students' collaboration skills.

3.3 Normality Test of Collaboration Skills (Y1)

The normality assessment was conducted utilizing SPSS version 30 statistical software to evaluate the distribution pattern of data obtained from student collaboration skill observations. The corresponding findings are presented in the subsequent table:

Table 3. Normality Test of Collaboration Skills

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Students' Score	Experiment Class	.139	32	.118	.941	32	.082
	Control Class	.142	32	.101	.963	32	.338

According to the normality test results above, the significance value for collaboration skills in the experimental class is 0.118 > 0.05. This suggests that the data on collaboration skills in the experimental class are normally distributed. Similarly, in the control class, the significance value is 0.101

> 0.05, indicating that the data on collaboration skills in the control class are normally distributed as well.

3.4 Normality Test of Communication Skills (Y2)

Statistical software SPSS version 30 was employed to perform normality testing on the communication assessment data, which was obtained through systematic evaluation of student presentations using predetermined scoring criteria. The analytical results are methodically presented in the table below:

Table 4. Normality Test of Communication Skills

Tests of Normality							
		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Class	Statistic	df	Sig.	Statistic	df	Sig.
Score	Experiment	.127	32	.200*	.931	32	.042
	Control	.142	32	.101	.945	32	.105

Based on the results of the normality test above, it can be observed that the significance value for communication skills in the experimental class is 0.200 > 0.05, indicating that the distribution of communication skills data in the experimental class is normal. Similarly, in the control class, the significance value is 0.101 > 0.05, which shows that the communication skills data in the control class follow a normal distribution..

3.5 Homogeneity Test of Collaboration Skills (Y1)

The results of the homogeneity test for students' collaboration skills can be seen in the following table:

Table 5. Homogeneity Test of Collaboration Skills

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
Students' score	Based on Mean	2.887	1	62	.094
	Based on Median	2.244	1	62	.139
	Based on Median and with adjusted df	2.244	1	58.939	.139
	Based on the trimmed mean	2.921	1	62	.092

Homogeneity or uniformity in the variance between the two groups (experimental class and control class) is indicated by the significance value of 0.094 > 0.05, based on the output of the homogeneity test for collaboration skills. Therefore, a significant difference in variance between the two groups is not shown by the data on students collaboration skills.

3.6 Homogeneity Test of Communication Skills (Y2)

The results of the homogeneity test for communication skills data can be seen in the following table:

Table 6. Homogeneity Test of Communication Skills

Test of Homogeneity of Variances					
		Levene Statistic	df1	df2	Sig.
SCORE	Based on Mean	.121	1	62	.729
	Based on Median	.123	1	62	.727
	Based on Median and with adjusted df	.123	1	61.765	.727
	Based on trimmed mean	.133	1	62	.717

The homogeneity or absence of significant difference in variance between the two groups (experimental class and control class) is indicated by the significance value of 0.729 > 0.05, based on the output of the communication skills test. Therefore, the homogeneity of the communication skills data is confirmed, and no significant variance difference between the tested groups is shown.

3.7 Data Analysis of Collaboration Skills Observation

Based on the findings obtained from the research data, an increase in students collaboration skills at SMP Negeri 8 Sungai Penuh was observed after the implementation of the Numbered Head Together (NHT) cooperative learning model. This improvement was reflected in the percentage of students demonstrating enhanced collaboration abilities following the application of this learning approach. The positive impact of the NHT model in fostering teamwork and active participation among students is further illustrated in the following graph, which visually represents the progression of their collaboration skills throughout the learning process:

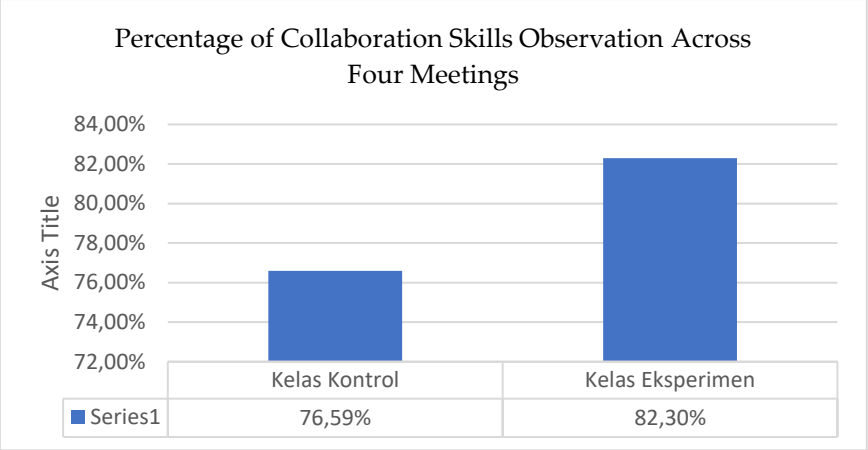

Figure 1. Processed Data Results of Collaboration Skills Observation

Based on the data analysis results, the average percentage of students collaboration skills over the course of four meetings in the experimental class, which applied the cooperative learning model of Numbered Heads Together (NHT), was 75%. In contrast, the control class, which utilized the traditional discussion method, showed an average percentage of 62%. The 13% difference between the two classes highlights the significant impact of the NHT model on enhancing students collaboration skills. This indicates that the NHT model, with its structured group work and collaborative approach, offers a more effective and engaging learning environment for developing students teamwork and communication abilities. The result suggests that using the NHT model can be a valuable strategy for fostering greater collaboration among students, as it encourages active participation and responsibility within the group, leading to more productive and successful learning outcomes.

3.8 Hypothesis Testing of Collaboration Skills (Y1)

A systematic validation process was employed to confirm the measurement tools' precision and consistency. Prerequisite analyses, including normality and homogeneity assessments, were conducted to verify the data's alignment with statistical requirements. This hypothesis examination phase serves to address research objectives and determine significant relationships among investigated variables through analytical procedures. The independent sample T-test results, generated through SPSS version 30, are methodically presented in the following table:

Table 7. Hypothesis Testing of Collaboration Skills

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Nilai Siswa	Equal variances assumed	2.887	.094	2.352	62	.022	1.625	.691	.244	3.006
	Equal variances not assumed			2.352	58.853	.022	1.625	.691	.242	3.008

Based on the calculations in Table 7, the t-value (t_{count}) in the t column is 2.352. To determine the effect of the independent variable on the dependent variable, this t-value is compared with the t-table value (t_{table}). From the df column in the equal variances assumed row, the df value is 62 at a 5% significance level, which corresponds to a t-table value of 1.670. Since $t_{count} > t_{table}$ (2.352 > 1.670) and the sig (2-tailed) value for students collaboration skills is 0.022 < 0.05, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. Therefore, it can be concluded that the cooperative learning model Numered Head Together (NHT) has a significant influence on students collaboration skills in Civics (PPKn) learning in Grade VIII at SMP Negeri 8 Sungai Penuh".

3.9 Effect Size

In this study, a Cohen's d calculation was conducted to measure the effect size of the difference in collaboration skills between the experimental group and the control group. Based on the analysis, the mean score of collaboration skills in the experimental group was 84.00 with a standard deviation of 4.846, while the control group had a mean of 80.75 with a standard deviation of 6.133.

To calculate Cohen's d, the pooled standard deviation was first calculated, resulting in a value of approximately 5.53. Subsequently, the Cohen's d value was calculated as follows:

$$d = \frac{M1 - M2}{SDpooled} = \frac{84.00 - 80.75}{5.53} = \frac{3.25}{5.53} = 0.59$$

Based on the interpretation guidelines for Cohen's d, the value of d = 0.59 indicates a moderate effect of the learning model implementation in the experimental group on students' collaboration skills compared to the control group.

3.10 Hypothesis Testing for Communication Skills (Y2)

The results of the independent sample T-test conducted using SPSS 30 for students' communication skills can be seen in the following table:

Table 8. Hypothesis Testing for Communication Skills

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
NILAI	Equal variances assumed	.121	.729	3.373	62	.001	2.063	.611	.840	**3.285**
	Equal variances not assumed			3.373	61.528	.001	2.063	.611	.840	**3.285**

Based on the calculations in Table 4.11, the t-value (t_{count}) is 2.597. This value is compared with the t-table (t_{table}) to determine the effect of the independent variable on the dependent variable. From the equal variances row in the df column, the degree of freedom (df) is 62, and at a 5% significance level, the corresponding t-table value is 1.670. Since $t_{count} > t_{table}$ (2.597 > 1.670) and the significance value (sig. 2-tailed) for students communication skills is 0.001 < 0.05, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_a) is accepted. Thus, it can be concluded that "There is a significant effect of the cooperative learning model type Numbered Head Together (NHT) on students communication skills in Civics learning (PPKn) for eighth-grade students at SMP Negeri 8 Sungai Penuh."

3.11 Effect Size

In this study, a Cohen's d calculation was conducted to measure the effect size of the difference in communication skills between the experimental group and the control group. Based on the analysis results, the mean score of communication skills in the experimental group was 82.81 with a standard deviation of 5.102, while the control group had a mean of 78.69 with a standard deviation of 4.673.

To calculate Cohen's d, the pooled standard deviation was first computed, resulting in a value of approximately 4.89. Subsequently, the Cohen's d value was calculated as follows:

$$d = \frac{M1 - M2}{SDpooled} = \frac{82.81 - 78.69}{4.89} = \frac{4.12}{4.89} = 0.84$$

Based on the interpretation guidelines for Cohen's d, the value of d = 0.84 indicates a large effect of the learning model implementation in the experimental group on students' communication skills compared to the control group.

Discussion

The results of the hypothesis testing reveal a statistically significant difference in students' collaboration skills between the experimental group, which was taught using the cooperative learning model Numbered Heads Together (NHT), and the control group, which experienced conventional instruction. The obtained t-value for collaboration skills was 2.352, exceeding the critical t-table value of 1.670, with a significance value of 0.022 ($p < .05$). This leads to the rejection of the null hypothesis (H_0) and acceptance of the alternative hypothesis (H_a), confirming that the NHT model had a significant positive effect on collaboration skills in Pendidikan Pancasila dan Kewarganegaraan (PPKn) learning among eighth-grade students at SMP Negeri 8 Sungai Penuh.

During the four-week implementation of the NHT model in class VIII F, a gradual but marked improvement was observed in students' collaboration and communication skills. Initially, many students exhibited discomfort and reluctance to participate actively in group tasks. This hesitation manifested in passive behavior and limited interaction within groups. However, as the students adapted to the cooperative structure of NHT, they became increasingly open, confident, and engaged. This transformation reflects the dynamic nature of cooperative learning, which not only fosters academic engagement but also nurtures interpersonal competence through sustained interaction.

The improvement in collaboration can be attributed to several factors inherent in the NHT model. A pivotal element was the teacher's role as a facilitator, which proved essential in guiding the learning process. As noted by Magdalena et al. (2024), teachers in a cooperative learning setting are responsible not only for delivering content but also for creating an environment that encourages equal participation, mutual respect, and structured interaction. The teacher in this study provided clear instructions, monitored group processes, and offered feedback that helped students navigate their collaborative roles. This scaffolding was especially important during the initial stages when students were unfamiliar with cooperative learning norms.

Eviliyanida (2022) highlights that students often need time and support to adjust to participatory learning models, especially if they come from traditional learning backgrounds where passive reception of information is the norm. The findings from this study corroborate this, as many students initially exhibited shyness or resistance. However, over time, the repeated practice of group tasks, structured turn-taking, and the requirement that each group member be prepared to represent the group's findings helped instill a sense of responsibility and accountability.

The egalitarian structure of NHT gave all students the opportunity to contribute, thus enhancing their sense of belonging and importance within the group. This participatory dynamic created an inclusive learning environment in which students felt safer and more motivated to collaborate. Students who were initially quiet or hesitant began taking initiative, contributing ideas, and participating actively in discussions. As Ramlah (2021) and Wulandari et al. (2023) argue, cooperative learning models like NHT empower students by validating their voices and fostering mutual support. This sense of collective responsibility led to more balanced task distribution and improved the quality of peer-to-peer interactions.

Importantly, students also became more confident in communicating with the teacher. Previously, many were reluctant to ask questions, often deferring to peers they perceived as more knowledgeable. However, with increased exposure to the NHT structure, students grew more willing to ask questions directly, signaling increased confidence and reduced anxiety. Osiesi and Blignaut (2025) note that teacher education programs that emphasize teamwork and communication can have long-lasting impacts, as these skills are consistently viewed by students as essential to their academic and professional development. In the present study, the students' increased willingness to engage with both peers and teachers reflects this broader importance.

In contrast, the control group (class VIII G), which received conventional instruction, showed limited improvement in collaboration and communication skills. Although the control class engaged in group activities during the four-week period, the structure lacked the built-in accountability and interactive components characteristic of NHT. Students in this class often remained passive, with a few dominant individuals leading group discussions while others contributed minimally. The learning atmosphere was less vibrant and collaborative, and teacher-student interaction remained largely unidirectional. While some students did become more involved toward the end of the study, the depth and consistency of their collaboration were noticeably lower than those in the experimental class.

This disparity underscores the limitations of traditional teaching approaches in fostering 21st-century skills. As noted by Larson and Miller (2011), modern educational practices must prioritize student-centered learning and communication, equipping students to function effectively in both academic and real-world contexts. Conventional methods, which emphasize lecture-based instruction

and individual learning, may not provide sufficient opportunities for students to engage meaningfully with one another or with content.

The theoretical underpinnings of these findings can be understood through constructivist learning theory, which posits that knowledge is actively constructed by learners through social interaction and engagement with their environment. The NHT model aligns closely with constructivist principles, as it encourages learners to build understanding collaboratively, negotiate meaning, and reflect on peer input. According to Vygotskian social constructivism, meaningful learning occurs when students are involved in problem-solving and dialogue with peers (Slavin, 2019). In this study, the collaborative problem-solving tasks within NHT groups allowed students to co-construct knowledge, leading to deeper conceptual understanding and enhanced social skills.

In addition to constructivism, Bandura's (1986) social learning theory provides a compelling explanation for the observed improvements. According to Bandura, individuals learn behaviors and skills through observation, imitation, and modeling. Within the NHT framework, students were exposed to peer models who demonstrated effective communication and collaboration. As they observed classmates sharing ideas confidently or offering constructive feedback, they began to emulate these behaviors. Over time, these social interactions facilitated skill acquisition and behavioral change, leading to more cohesive and interactive group dynamics.

The impact of the NHT model on communication skills was further confirmed through hypothesis testing. The t-value for communication was 2.597, exceeding the t-table value of 1.670, with a significance level of 0.001 ($p < .05$). This indicates a statistically significant difference between the experimental and control groups in terms of communication development, with the NHT model having a more pronounced positive effect.

During the early stages of the intervention, students in the experimental group appeared hesitant to present ideas without relying heavily on notes. This reliance reflected both a lack of self-confidence and limited experience with oral communication in a group setting. However, consistent practice within the NHT structure gradually reduced this dependency. By the third and fourth weeks, students were able to present more fluently, explain group findings clearly, and engage in reciprocal dialogue. Presentations became more expressive, and students demonstrated greater spontaneity and comfort when responding to questions from peers or the teacher.

This transformation aligns with the findings of Wulandari et al. (2023), who argue that NHT not only facilitates content mastery but also strengthens students' communication competence by encouraging oral articulation, feedback exchange, and audience awareness. The model's inherent design—where any member may be called to represent the group—ensures that all students prepare actively and become proficient in expressing ideas clearly.

By contrast, the control group exhibited only marginal gains in communication. Students in this group remained reliant on reading notes during presentations and often communicated in low-volume, monotone speech. While some improvement was observed, particularly in students' willingness to speak in front of others, the depth and clarity of their communication lagged behind their peers in the experimental class. This suggests that without intentional structuring of dialogue and peer engagement, communication skills may develop more slowly.

Moreover, the traditional teacher-centered approach adopted in the control group offered limited opportunities for students to practice public speaking or engage in reciprocal dialogue. While repetition and exposure contributed to modest gains, the lack of a supportive and interactive learning environment impeded more significant improvements. Consistent with Urbani et al. (2017), communication skills in education are most effectively developed when embedded in authentic, interactive tasks that require active participation and feedback.

Both constructivist theory and social learning theory offer important insights into these outcomes. Constructivism emphasizes active learning and social interaction as foundational to knowledge construction. When students present group findings in the NHT model, they are not simply reciting

information but synthesizing collaboratively constructed knowledge. This not only strengthens their understanding but also develops their ability to communicate complex ideas in a structured manner.

Meanwhile, Bandura's social learning theory highlights the importance of modeling and observational learning. In NHT, students witness a variety of communication strategies, from articulating key points to responding to peer questions. As students observe successful communicators within their groups, they internalize these behaviors and begin to apply them in their own presentations. These peer-to-peer influences play a central role in shaping communication practices within cooperative learning environments.

In conclusion, the implementation of the Numbered Heads Together (NHT) cooperative learning model significantly improved students' collaboration and communication skills in PPKn learning at SMP Negeri 8 Sungai Penuh. These findings reinforce the theoretical foundations of constructivism and social learning, demonstrating that cooperative models rooted in interaction, peer modeling, and shared responsibility can effectively cultivate 21st-century competencies. While conventional methods may still support basic communication and collaboration development, their impact is comparatively limited. Therefore, integrating structured cooperative strategies like NHT into civic education curricula can enhance not only academic achievement but also the social-emotional competencies essential for active and responsible citizenship.

4. CONCLUSION

This study concludes that the cooperative learning model Numbered Heads Together (NHT) significantly enhances students' collaboration and communication skills in Civics Education (PPKn) at SMP Negeri 8 Sungai Penuh, as demonstrated by hypothesis testing and independent sample t-tests showing meaningful differences compared to conventional teaching methods. These findings affirm the effectiveness of NHT in fostering essential 21st-century social competencies and align with both constructivist and social learning theories, which emphasize the role of interaction and peer engagement in the learning process. However, the study is limited by its focus on a single subject area, a specific grade level, and a short intervention period, which may affect the generalizability of the results. Future research should explore the application of the NHT model across different subjects, educational levels, and longer durations, while also examining additional influencing factors such as student motivation, teacher facilitation skills, and intra-group social dynamics to gain a more holistic understanding of its impact on student learning.

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