Journal Visipena
Volume 16, Number 2, 2025 pp. 291-302
P-ISSN 2086-1397 E-ISSN: 2502-6860
Open Access: https://ejournal.bbg.ac.id/visipena

EFFECTIVENESS OF THE NUMBERED HEADS TOGETHER (NHT) MODEL BASED ON SNAKES AND LADDERS MEDIA ON STUDENTS' ENGAGEMENT IN SKI

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ARTICLE INFO

Article history:
Received : Oct 14, 2025
Revised : Nov 29, 2025
Accepted : Dec 25, 2025
Available online : Dec 31, 2025

Keywords:
Numbered Heads Together (NHT), Snakes and Ladders Media, Students' Engagement, Quasi-Experimental Design, Islamic Cultural History

ABSTRACT

Student engagement is a crucial indicator of successful educational outcomes. However, in practice, engagement levels often remain low, particularly in Islamic Cultural History (SKI) courses. Preliminary research conducted at MTs Negeri 2 Bandar Lampung revealed that only 2% of students actively engaged in asking questions to teachers or peers, indicating a predominantly passive attitude towards learning. This situation highlights the urgent need for innovative teaching methods that can effectively foster active student participation. Accordingly, this study empirically examines the effectiveness of the Numbered Heads Together (NHT) cooperative learning model, integrated with Snakes and Ladders game media, in enhancing students' engagement in Islamic Cultural History (SKI). The research adopts a quantitative approach using a quasi-experimental design with a post-test-only control group framework. The sample consists of two intact groups from seventh-grade classes, selected via intact group sampling techniques. One class served as the experimental group, utilizing NHT with Snakes and Ladders media, while the other group was the control, applying the Jigsaw method. Data on learning activity were collected through questionnaires and analyzed using independent sample t-tests, along with effect size calculations. The findings revealed a significance level of 0.269 (> 0.05) and a Cohen's d of 0.027, indicating no statistically significant difference between the experimental and control groups, with the treatment effect being negligibly small in practical terms. These results suggest that the effectiveness of the NHT model based on game media is context-dependent and influenced by students' preparedness, self-confidence, and emotional factors. Consequently, for NHT to function optimally in enhancing student engagement, it requires strengthening of the affective domain alongside consistent reinforcement of cooperative learning practices.

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INTRODUCTION

Student engagement is shaped by the design of learning activities, the role of teachers as facilitators, and the extent of students' active participation. Engagement becomes evident when students are involved in learning tasks, collaborate with peers,

engage in problem-solving, and exchange perspectives (Septiawati et al., 2022). Studies indicate that student engagement does not occur independently, but is strongly affected by the quality of instructional design and the presence of a supportive learning environment (Muhammad et al., 2025). The use of varied teaching strategies, the integration of technology, and constructive assessment practices have been shown to enhance students' participation in the learning process (Bizimana, 2025; Pramesty & Suratno, 2022). However, persistent challenges such as insufficient preparation and limited learning resources often create a gap between ideal engagement and actual classroom practice. Consequently, student engagement emerges from the interaction between the learning system, the classroom environment, and teachers' instructional strategies. Identifying existing obstacles and implementing appropriate solutions are therefore essential steps toward achieving optimal student engagement.

Based on preliminary research conducted through classroom observations and interviews with an SKI teacher at MTs Negeri 2 Bandar Lampung, several issues were identified in the implementation of SKI learning. First, many students experience difficulty expressing their ideas or arguments when prompted by the teacher. Second, a considerable number of students demonstrate low levels of enthusiasm and concentration during classroom learning activities. Third, student participation in group discussions remains limited. Finally, low interest in the subject contributes to variations in students' levels of learning activeness.

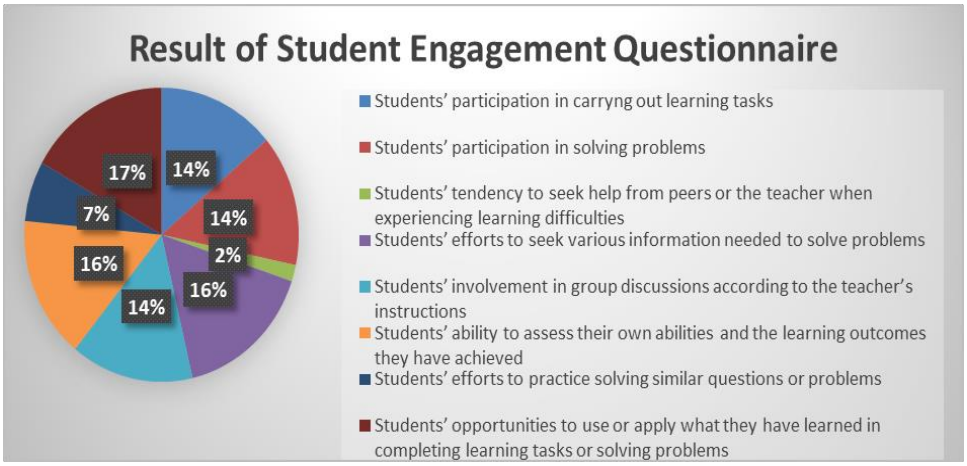

Figure 1. Summary of the Student Engagement Questionnaire Results

Based on the student engagement questionnaire results illustrated in the diagram, the lowest-scoring aspect was students' tendency to ask peers or the teacher for assistance when encountering difficulties, accounting for only 2%. This finding indicates that

students tend to remain passive in initiating communication and seeking help when they experience learning challenges. This result is consistent with data obtained from interviews and classroom observations, which revealed that the previously applied instructional model presented several obstacles that reduced the effectiveness of the teaching and learning process. Consequently, students were not sufficiently encouraged to develop the confidence to ask questions actively. Therefore, the central problem identified in this study is the low level of student engagement, particularly with respect to questioning behavior during Islamic Cultural History (SKI) lessons. This condition highlights the need for an innovative instructional approach through the implementation of a learning model that fosters a more interactive classroom atmosphere, stimulates active student participation, and enhances students' understanding of and interest in the subject matter.

To improve students' initiative and learning engagement, the Numbered Heads Together (NHT) cooperative learning model is considered a promising alternative. In this approach, students are organized into small groups, with each member sharing responsibility for jointly understanding the learning material and completing group tasks (Limbong & Mnurung, 2022). The teacher poses questions for group discussion, after which one member is randomly selected to present the group's responses (Nisa et al., 2024; Octaviani et al., 2023; Zai & Kartolo, 2025). This discussion-based process supports the development of critical thinking skills and helps students connect academic concepts with real-life contexts (Astutik & Wulandari, 2021; Bayu et al., 2023). The NHT cooperative learning model promotes student engagement by ensuring that all learners are actively involved in discussion and problem-solving activities (Rijal et al., 2021). Moreover, the use of random numbering encourages students to understand the material more thoroughly and to contribute actively to their group's performance (Etta, 2022; Imroah & Komalasari, 2025; Lehawati et al., 2020). This study proposes an alternative approach to enhance student learning engagement by applying the Numbered Heads Together (NHT) cooperative learning model. This model offers a holistic learning experience by actively involving students in interactive activities with both the teacher and their classmates, thereby fostering a more dynamic and enjoyable learning environment (Alirman, 2021; Arnis, 2020; Prayekti et al., 2021). Through structured group work, students are encouraged to articulate their understanding, exchange ideas, and actively engage in discussions and question-and-answer sessions (Solikhin et al., 2021; Suryadi, 2020; Tasa, 2022). This approach can also enhance learning motivation by

fostering a sense of engagement and responsibility for the learning process. As a result, students are more likely to absorb, retain, and master the material being taught (Ardana et al., 2022; Datuela et al., 2025; Sukirman et al., 2022).

The urgency of this study stems from the low level of student engagement, particularly in asking questions to teachers and peers, which accounts for only 2%. This condition reflects the dominance of passive attitudes in the learning process and, consequently, hinders students' conceptual understanding and critical thinking abilities. The novelty of this research lies in the integration of the Numbered Heads Together (NHT) cooperative learning model with Snakes and Ladders game media, which serves as a catalyst for interaction and as a means to reduce students' anxiety during discussions and number-calling activities. This approach aims to encourage students' courage to ask questions and to foster active involvement in the learning process. Unlike the conventional application of NHT in previous studies, this approach positions game media as a strategic element for creating a safer and more enjoyable learning environment. Accordingly, the primary objective of this study is to empirically examine the effectiveness of the Numbered Heads Together (NHT) cooperative learning model, integrated with Snakes and Ladders game media, on students' engagement in the Islamic Cultural History (SKI) subject at MTs Negeri 2 Bandar Lampung.

RESEARCH METHODS

This study employs a quantitative approach using a quasi-experimental method with a post-test-only control group design. The research was conducted during the odd semester of the 2025/2026 academic year at MTs Negeri 2 Bandar Lampung. The sampling technique applied was non-probability sampling, specifically intact group sampling, in which participants were selected based on pre-existing class groups without random assignment. Class VII F served as the experimental group and received the Numbered Heads Together (NHT) cooperative learning model integrated with Snakes and Ladders game media, while Class VII G acted as the control group and was taught using the Jigsaw cooperative learning model. Both groups were administered the same post-test to assess the effectiveness of the treatment.

To ensure that the treatment was implemented consistently and in accordance with the research design, treatment fidelity was closely monitored. Several measures were taken to maintain fidelity. First, the researcher developed standardized teaching modules for both the experimental and control classes, ensuring that the only difference between

the two groups was the instructional model employed. Second, lessons for both groups were conducted by the same teacher, with equal time allocations, instructional materials, and learning objectives, in order to minimize bias arising from differences in teaching style. Third, the researcher conducted direct classroom observations to ensure that the NHT model integrated with Snakes and Ladders game media was implemented in accordance with the prescribed procedures, including group formation, member numbering, group discussions, random number calling, and collective summarization. Fourth, the use of Snakes and Ladders game media was strictly controlled to ensure that it was applied only in the experimental class, while the control class followed the instructional treatment as designed. With these controls in place, the results of this study are expected to accurately reflect the effects of the treatment, rather than being influenced by external factors.

The research process begins with a preparation phase in which the teacher divides students into small groups of three to five members, with each member assigned a sequential number. The teacher then presents different questions to each group and distributes a guidebook as a learning resource. Subsequently, students engage in group discussions to identify the most appropriate answers to the questions, ensuring that all group members understand the discussion content. Following the discussion, the teacher randomly selects one number from each group, and the student whose number is called represents the group in answering the question in front of the class. This process concludes with a class-wide activity in which the teacher and students collaboratively summarize the discussion outcomes. The Snakes and Ladders game media is utilized during the learning phase to further enhance interactive student engagement (Maharani et al., 2024; Wuda & Anugraheni, 2021).

Student engagement was measured using a non-test instrument in the form of a questionnaire, developed based on engagement indicators proposed by Nana Sudjana, one of which is asking other students or the teacher when a problem is not understood. The validity of the questionnaire was tested using the Product–Moment correlation, while its reliability was assessed using Cronbach's Alpha coefficient. Before analyzing the data using the independent samples t-test and Cohen's d effect size to examine the effect of the treatment, prerequisite tests were conducted, including a normality test using the liliefors formula and a homogeneity test using Bartlett's formula. The statistical analysis of the post-test results from both classes is intended to determine whether the use of the Numbered Heads Together (NHT) cooperative learning model integrated with Snakes

and Ladders game media has a significant impact on student engagement compared to the Jigsaw cooperative learning model.

RESULTS AND DISCUSSION

This study was conducted at MTs Negeri 2 Bandar Lampung. Various data collection techniques were employed, including the administration of a non-test instrument in the form of a questionnaire aligned with student engagement indicators, which was subsequently tested for validity and reliability. The following section presents the data obtained from the validity test.

Based on the results of the validity and reliability tests conducted in the pilot class, all 10 items demonstrated significance values greater than 0.413, indicating that the instrument was valid. In terms of reliability, the Cronbach's Alpha coefficient was 0.674, exceeding the threshold value of 0.6, which suggests that the non-test instrument was sufficiently reliable for measuring the research variables. The data analysis results from Class 7 F (experimental) and Class 7 G (control) regarding student engagement in the Islamic Cultural History (SKI) subject led to the following interpretation of the results:

1. Normality Test

Normality testing was conducted to determine whether the research data followed a normal distribution. The data were considered normally distributed if the significance value exceeded 0.05. The results of the normality test in this study are presented as follows.

Table 1. Description of the Normality Test Results

Tests of Normality

		Kolmogorov-Smirnova			Shapiro-Wilk		
Kektifan Belajar	Kelompok	Statistic	df	Sig.	Statistic	df	Sig.
	Kelompok A	.106	34	.200*	.966	34	.364
	Kelompok B	.140	34	.091	.965	34	.334

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the results of the normality test presented in Table 1, which were analyzed using the Shapiro–Wilk test due to the number of respondents being fewer than 100, it can be concluded that the research data met the assumption of normality. Group A obtained a significance value of 0.364, indicating that the data were normally distributed. Similarly, Group B obtained a significance value of 0.334, which is also greater than 0.05, confirming that the data followed a normal

distribution. Therefore, the use of non-parametric tests, such as the Mann–Whitney test, was not required in this study.

2. Homogeneity Test

Homogeneity testing was conducted to assess the equality of variances between the research groups. The data were considered homogeneous if the significance value exceeded 0.05. The results of the homogeneity test in this study are presented as follows.

Table 2. Description of the Homogeneity Test Results

Levene Statistic			df1	df2	Sig.
Kektifan Belajar	Based on Mean	2.387	1	66	.127
	Based on Median	1.704	1	66	.196
	Based on Median and with adjusted df	1.704	1	55.897	.197
	Based on trimmed mean	2.399	1	66	.126

Based on the results of the homogeneity test presented in Table 2, all significance values (sig) were 0.127, which exceeds 0.05. This result indicates that the data variances were homogeneous. Therefore, it can be concluded that the assumption of homogeneity was met in this study.

3. Hypothesis Testing

This study employed an Independent Samples t-test as the hypothesis testing technique to analyze differences in final outcomes between the two sample groups. This test was used to determine whether there was a statistically significant difference between the experimental group, which received the treatment, and the control group, which did not receive the treatment.

Table 3. Description of the Independent Samples T-Test Results

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Kektifan Belajar	Equal variances assumed	2.387	.127	-1.115	66	.269	-.9118	.8180	-2.5449	.7214
	Equal variances not assumed			-1.115	59.960	.269	-.9118	.8180	-2.5480	.7245

Based on the data analysis results, Levene's Test for Equality of Variances yielded a significance value (Sig. 2-tailed) of 0.269, which is greater than 0.05. Since the calculated t-value ($t_{calculation}$) is greater than the critical t-value (t_{table}) the null hypothesis (H_0) is rejected.

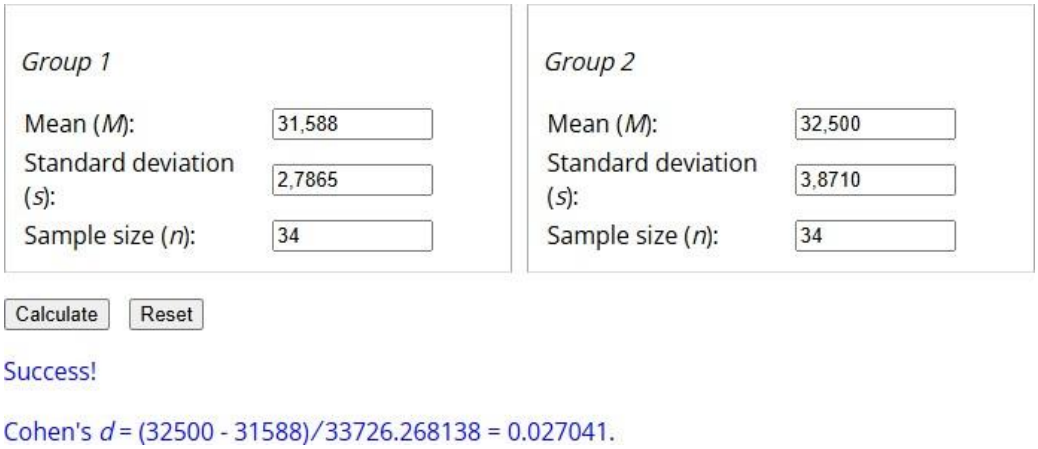

Figure 2. Cohen's d Effect Size Output

Based on the analysis presented in Figure 2, the Cohen's d effect size of 0.027 indicates that the impact of the Numbered Heads Together (NHT) cooperative learning model integrated with Snakes and Ladders game media on student engagement was very small. Consequently, in practical terms, the treatment did not produce a noticeable change. These results are consistent with the findings of the independent samples t-test,

which yielded a significance value of 0.269, exceeding 0.05, indicating no statistically significant difference between the experimental and control groups. This suggests that the implementation of the NHT model integrated with Snakes and Ladders game media did not produce a meaningful practical effect on student engagement in the Islamic Cultural History (SKI) subject.

Preliminary research revealed that the engagement indicator related to students' willingness to ask questions of the teacher or peers was only 2%. This low level of willingness did not show a significant improvement after the application of the NHT model, as students continued to exhibit passive behavior, hesitated to express their opinions, and feared making mistakes during discussions. This condition suggests that the fundamental issue in the learning process lies in students' affective aspects, indicating that they were not yet fully prepared to engage in cooperative learning methods.

From a theoretical perspective, the limited impact of the intervention can be attributed to students' low levels of self-efficacy. Students with low self-efficacy tend to

avoid active participation, even when learning activities are designed to be cooperative and participatory. This helps explain why the NHT cooperative learning model, which theoretically emphasizes teamwork and individual responsibility, was unable to effectively encourage students' courage to ask questions and express opinions in the context of this study, particularly given the relatively short duration of the intervention.

In addition to self-confidence, students' learning readiness plays a crucial role in the effectiveness of the NHT model's implementation. Cooperative learning requires both cognitive and affective readiness, including an initial understanding of the material, communication skills, and a willingness to collaborate within a group. When these aspects are not sufficiently developed, students tend to rely on certain group members or simply follow the flow of discussion without meaningful active involvement. This condition results in suboptimal group interactions, thereby limiting the intended outcomes of cooperative learning.

From an affective perspective, emotional barriers remain present in cooperative learning, including anxiety when speaking in front of peers, social pressure within the group, and fear associated with random number calling. Although the Snakes and Ladders game media was designed to create a more enjoyable learning environment, in practice, it has not fully succeeded in alleviating the affective barriers experienced by students. Additionally, the use of Snakes and Ladders game media was not fully optimized to strengthen students' conceptual understanding; rather, it functioned primarily as a supportive tool for creating a positive learning atmosphere, rather than as an instructional medium that directly enhanced student engagement.

Therefore, the findings of this study confirm that the effectiveness of the NHT cooperative learning model integrated with game media is conditional and highly dependent on students' mental readiness, self-confidence, and learning culture. The NHT model cannot be considered a stand-alone solution for enhancing student engagement without parallel efforts to strengthen affective aspects and learning readiness. Accordingly, learning innovations should be designed holistically by taking students' characteristics into account in order to achieve the optimal outcomes of cooperative learning.

Although the study did not demonstrate significant effects, it still provides valuable insights for educational practice. For educators, the findings highlight that effective implementation of the NHT cooperative learning model requires careful initial preparation, including building students' self-confidence, fostering a culture of

questioning, and providing communication support before introducing cooperative learning activities. For students, this research can serve as a tool for self-evaluation to enhance their courage and teamwork skills. For future researchers, these findings provide a foundation for developing a more adaptive NHT cooperative learning model, such as by strengthening pre-learning stages, creating more balanced groupings, or integrating learning media more closely with cognitive learning objectives.

CONCLUSION AND SUGGESTION

Based on the results of this study, it can be concluded that the Numbered Heads Together (NHT) cooperative learning model integrated with Snakes and Ladders game media was not effective in enhancing student engagement in the Islamic Cultural History (SKI) subject among seventh-grade students at MTs Negeri 2 Bandar Lampung. This conclusion is supported by the t-test significance value of 0.269, which exceeds 0.05, indicating no statistically significant difference between the experimental group, which received the NHT treatment, and the control group, which was taught using the Jigsaw model. Furthermore, the effect size analysis, with a Cohen's d value of 0.027, indicates only a minimal difference in mean scores between the experimental and control groups.

Theoretically, these findings suggest that although the NHT model is conceptually designed to foster individual responsibility, stimulate cooperative discussions, and promote active participation through random student selection, its effectiveness is highly dependent on students' learning readiness. This readiness includes aspects such as self-confidence, willingness to ask questions, and active participation in discussions. These findings highlight that the implementation of cooperative learning models such as NHT requires a more developed learning culture, strengthened internal motivation, and consistent teacher support to ensure that learning processes are optimized for enhancing student engagement.

In light of the findings, it is recommended that teachers prioritize strengthening foundational skills, such as encouraging students to ask questions, familiarizing them with discussion-based activities, and providing continuous support before implementing cooperative learning models such as NHT. Schools are also encouraged to provide adequate learning facilities and professional development opportunities for teachers to ensure that instructional innovations can be implemented effectively. Students are advised to work on increasing their self-confidence, willingness to express their opinions, and active participation in group work. Furthermore, future researchers are encouraged

to extend the duration of the treatment, involve larger sample sizes, and integrate the NHT model with other approaches or instructional media that address key challenges, such as low self-confidence and the dominance of certain group members. These efforts may enhance the effectiveness of the learning process and yield more comprehensive findings.

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