EDUCATION

Enhancing the Division Performance of Grade 3 Learners Using the Numbered Heads Together Strategy

Rhacher P. Magbago, Jane P. Gordove, Genelyn R. Baluyos, Eugenio C. Bucog

Misamis University, Ozamiz City, Philippines

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Abstract

Mathematics is a fundamental subject that develops learners' logical thinking, problem-solving, and numeracy skills. However, many Grade 3 learners experience difficulty in understanding and solving division problems. This classroom-based action research aimed to determine the effectiveness of the Numbered Heads Together (NHT) strategy in enhancing the division performance of Grade 3 learners in a selected public elementary school in Ozamiz City during School Year 2025–2026. The study employed a one-group pretest–posttest action research design involving thirty-eight (38) Grade 3 learners selected through purposive sampling. A researcher-made Division Skills Test, validated by experts, served as the primary data-collection instrument. The study used the mean, standard deviation, frequency, percentage, and paired-sample t-test to analyze the data. Findings revealed that learners' division performance improved from Did Not Meet Expectations before the intervention to Outstanding after its implementation. The paired-sample t-test showed a highly significant difference between the pretest and posttest results ($t = 21.6$, $p < 0.001$), indicating that NHT significantly enhanced learners' division performance. The study concludes that NHT is an effective cooperative learning strategy for improving learners' division skills and participation in mathematics.

Keywords: Action research; cooperative learning; division performance; Grade 3 learners; mathematics instruction; Numbered Heads Together; numeracy skills

1 Introduction

1.1 Context and rationale

Mathematics plays a crucial role in developing learners' logical thinking, problem-solving ability, and numerical understanding, which are essential skills for academic success in the primary grades. Among the basic mathematical operations, division is one of the most challenging for young learners because it requires both conceptual understanding and procedural accuracy. Research shows that mathematical fluency, particularly in operations such as multiplication and division, continues to develop throughout the primary school years and requires consistent practice and effective instructional support (Gliksman et al., 2022). However, many pupils struggle to achieve automaticity and accuracy in division, which negatively affects their overall performance in mathematics (Amland et al., 2024). Difficulties in foundational mathematical skills may also influence pupils' ability to progress to more complex mathematical concepts (Marwati & Mas'ud, 2021).

Several studies have reported that pupils often struggle to solve division problems because of weak understanding of number relationships, limited problem-solving strategies, and ineffective classroom instruction. Teachers may struggle to explain division in conceptually meaningful ways, leading

pupils to rely on memorization rather than understanding (Korkmaz, 2021). Learners who do not fully understand division tend to make frequent computational errors and show low accuracy when solving division problems (Marwati & Mas'ud, 2021). Cognitive research further indicates that symbolic number skills and language comprehension strongly predict arithmetic performance, including division, emphasizing the need for structured learning experiences that support accurate and fluent computation (Amland et al., 2024).

To address these challenges, researchers have emphasized instructional strategies that promote repeated practice and clear understanding of mathematical concepts. Traditional teacher-centered approaches may limit opportunities for pupils to process mathematical ideas deeply, which can affect accuracy and fluency in computation. In contrast, structured instructional approaches that allow pupils to discuss and verify solutions have been shown to support better understanding of mathematical procedures (Abd Algani, 2021). Instructional strategies that encourage explanation and shared problem-solving also help pupils refine their computational skills and reduce errors (Sujatha & Vinayakan, 2022). Effective mathematics instruction therefore plays a key role in strengthening pupils' accuracy and fluency in division (Ansari & Khan, 2020).

One instructional strategy widely used in mathematics classrooms is the Numbered Heads Together (NHT) strategy. NHT is a structured group-learning approach in which pupils work together to solve mathematical problems and ensure that each group member understands the solution. Studies show that NHT improves mathematics learning outcomes by allowing learners to verify answers and clarify misconceptions through discussion (Sari & Surya, 2017). The strategy has also been found to positively influence pupils' numeracy performance, as reflected in improved test scores after implementation (Warmansyah et al., 2022). Compared with conventional teaching methods, NHT is more effective in improving pupils' mathematical problem-solving ability (Istiqlal & Kustianingsih, 2020).

Beyond academic performance, NHT also supports pupils' engagement and collaboration during mathematics learning. When pupils are given opportunities to think together and explain their answers, they become more active and confident in class. Tamara (2025) found that early-grade learners taught using the NHT model demonstrated significantly higher collaboration and participation than those taught through traditional group work. Classroom action research also indicates that NHT helps learners become more attentive, enthusiastic, and willing to participate in learning activities, creating a more supportive and interactive classroom environment (Mahmudah & Rasyid, 2022). Cooperative learning strategies have likewise been associated with increased motivation and positive learning behavior (Abd Algani, 2021).

The researcher observed that many Grade 3 pupils experience difficulty in solving division problems during daily mathematics lessons. Some learners struggle to recall basic multiplication facts needed for division, while others find it hard to explain how they arrived at their answers. These difficulties are reflected in low quiz scores, slow problem-solving speed, and limited participation during class discussions. Several pupils also rely heavily on their classmates when answering division questions, indicating a lack of confidence and independent understanding. Previous studies have reported similar classroom challenges related to division learning (Marwati & Mas'ud, 2021). Learners' low engagement has also been linked to difficulties in mathematical performance (Ansari & Khan, 2020).

An empirical gap appears in the prior research. Although several studies have shown that cooperative learning strategies, particularly the Numbered Heads Together (NHT) model, can support learning in mathematics, research that specifically examines their direct impact on pupils' division performance

remains limited. Previous findings reveal that NHT can improve students' mathematics achievement, numeracy, and problem-solving ability through structured group interaction and shared responsibility for answers (Sari & Surya, 2017). Evidence from recent studies also indicates that NHT enhances pupils' collaboration, participation, and engagement in mathematics learning, which are important for developing understanding and confidence (Mahmudah & Rasyid, 2022).

Despite these findings, most existing studies focus on general mathematics achievement, numeracy, or problem-solving skills rather than on pupils' accuracy and fluency in division. Furthermore, earlier research often emphasizes students' engagement and collaborative behavior rather than providing empirical measures of division performance, such as computational accuracy and speed. No study has directly examined the effect of a classroom-based, teacher-implemented Numbered Heads Together strategy on Grade 3 pupils' division accuracy, fluency, and engagement in an authentic elementary classroom setting. Very little empirical work has examined the use of a localized, cooperative learning strategy such as NHT to strengthen division performance among young learners. This gap in the literature highlights the need for classroom-based action research to examine how NHT can improve pupils' division skills in real instructional contexts (Miles, 2017).

This action research aims to enhance the division performance of Grade 3 learners through the Numbered Heads Together (NHT) cooperative learning strategy. This study seeks to improve pupils' accuracy, fluency, and confidence in solving division problems by engaging them in structured group discussions and shared problem-solving activities. Research has shown that cooperative learning strategies such as NHT can strengthen mathematical understanding, participation, and learning outcomes by encouraging learners to think together and explain their reasoning (Abd Algani, 2021).

By implementing NHT in Grade 3 mathematics lessons, this study aims to provide pupils with more opportunities to practice division, clarify misconceptions, and develop stronger number sense through peer interaction and guided collaboration. The study also intends to contribute to classroom-based evidence on the effectiveness of NHT in improving elementary pupils' division skills, supporting the use of cooperative learning as an effective strategy for strengthening foundational numeracy.

The findings of this study contribute to the growing body of research on cooperative learning in mathematics by providing classroom-based evidence on the effectiveness of NHT in improving pupils' division skills. By addressing learners' difficulties in division and promoting active participation through group problem-solving, this study offers practical insights for teachers who aim to strengthen foundational numeracy skills in the elementary classroom. Ultimately, enhancing pupils' division performance through collaborative learning supports better mathematical understanding and prepares learners for more advanced mathematical tasks in the future.

This study aligns with the United Nations Sustainable Development Goal 4, which emphasizes inclusive and equitable quality education and the promotion of lifelong learning opportunities for all. By improving Grade 3 pupils' division performance through the Numbered Heads Together strategy, the research contributes to strengthening foundational numeracy, which is a key component of quality education. Building division skills early helps pupils develop confidence, critical thinking, and problem-solving abilities essential for academic success and lifelong learning. Moreover, a cooperative and interactive strategy such as Numbered Heads Together promotes equitable access to effective learning by encouraging all pupils to participate, share ideas, and learn from one another, including those who may struggle in traditional teacher-centered classrooms.

1.2 Strategy

The proposed innovation of this study is the Numbered Heads Together (NHT) strategy, a cooperative learning approach designed to enhance the division performance of Grade 3 pupils through structured group interaction and shared responsibility for learning. This intervention is grounded in the need to address pupils' low accuracy, weak fluency, and limited confidence in solving division problems. NHT allows pupils to work in small groups to discuss, think through, and solve division tasks together, ensuring that every learner is prepared to explain and justify the group's answer. Its scope focuses on Grade 3 division skills aligned with the Most Essential Learning Competencies (MELCs). At the same time, its limitations include the need for careful teacher facilitation, group management, and possible differences in pupils' participation and cooperation.

Studies show that cooperative learning strategies such as Numbered Heads Together improve students' mathematics achievement, engagement, and problem-solving abilities. Research indicates that NHT helps learners actively process mathematical concepts through discussion and peer explanation, leading to better understanding and performance (Sari & Surya, 2017). Other studies have found that NHT is more effective than conventional instruction in improving mathematical problem-solving skills (Istiqlal & Kustianingsih, 2020). In addition, NHT promotes collaboration, participation, and confidence among pupils, which are important for learning mathematics effectively (Mahmudah & Rasyid, 2022). These findings strongly support using the Numbered Heads Together strategy as an effective approach to improving pupils' division performance.

The intervention followed a structured process. The teacher first organized pupils into small groups and assign each member a number. A pretest was administered to establish pupils' baseline division performance levels. During the implementation phase, the teacher conducted division lessons using the Numbered Heads Together strategy, where pupils discuss division problems, agree on solutions, and respond when their number is called. The teacher guided discussions and provide feedback as needed. Pupils' participation and engagement were observed throughout the sessions. After the intervention, a posttest and final engagement assessment were conducted. The results of the pretest, posttest, and observation data were analyzed to determine improvements in pupils' division accuracy, fluency, and overall engagement.

1.3 Statement of the problem

This study aims to determine the effectiveness of the Numbered Heads Together (NHT) strategy in enhancing the division performance of Grade 3 learners in Mathematics at a selected public elementary school in Ozamiz City during the school year 2025–2026. Specifically, it seeks to answer the following questions:

1. What is the level of Grade 3 learners' division performance in terms of accuracy and fluency before the implementation of the Numbered Heads Together strategy?
2. What is the level of Grade 3 learners' division performance in terms of accuracy and fluency after the implementation of the Numbered Heads Together strategy?
3. Is there a significant difference in the division performance of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy?

1.4 Null hypothesis

H01: There is no significant difference in the division accuracy of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy.

2 Methodology

2.1 Research design

This study employed a classroom-based action research approach using a single pretest–posttest design. A pretest–posttest design evaluated an instructional strategy by measuring pupils' skills before and after its implementation (Amalia et al., 2024). This design was deemed appropriate for the present study as it allowed the researcher to assess how the use of the Numbered Heads Together (NHT) strategy influenced Grade 3 pupils' division performance, particularly in terms of accuracy and fluency, through structured cooperative learning activities and group discussions during Mathematics lessons (Sari & Surya, 2017).

2.2 Research setting

This study was conducted in a public elementary school in Misamis Occidental, Philippines. The school offered elementary education and provided a supportive learning environment with basic instructional materials and facilities suitable for young learners.

The research focused on Grade 3 pupils enrolled in Mathematics, where learners were expected to develop essential skills in division, multiplication, and problem-solving. The study selected a single Grade 3 section as the main group. This grade level was appropriate for examining the effectiveness of the Numbered Heads Together strategy, as pupils at this stage were strengthening their understanding of division and needed interactive and cooperative activities to improve accuracy, fluency, and confidence.

2.3 Participants of the study

This study included thirty-eight (38) Grade 3 pupils enrolled in a public elementary school in Ozamiz City, Misamis Occidental, Philippines, during the School Year 2025–2026. Purposive sampling was employed to ensure that the selected respondents were actively participating in Mathematics lessons and were directly engaged in learning division concepts. Only pupils whose parents or guardians provided informed consent were included in the study, ensuring adherence to ethical research standards. This selection aimed to address the gap in research on the effectiveness of the Numbered Heads Together (NHT) strategy in improving Grade 3 pupils' division accuracy and fluency. By focusing on this group, the study provided classroom-based evidence on how cooperative learning through NHT enhanced pupils' understanding and performance in division.

2.4 Research instruments

The study used the following data-gathering instruments:

Division Skills Test (pretest and posttest). The researcher-made Division Skills Test measured Grade 3 learners' level of division accuracy and fluency before and after the implementation of the Numbered Heads Together strategy. It was administered in two phases: a pretest before the intervention and a posttest after the intervention. The test consisted of 25 items covering basic division skills such as exact division, division with remainders, estimation, and word problems. The items were aligned with the Grade 3 Most Essential Learning Competencies (MELCs). Content validity was ensured by having the test reviewed by the critic teacher and subject area specialists. A pilot test was conducted with a comparable group of learners to check clarity and difficulty level. Reliability was established

using Cronbach's alpha to measure internal consistency. The score ranges used to interpret performance are given in Table 1.

Table 1. Score ranges and interpretation for the Division Skills Test.

Score Range	Interpretation
27–30	Outstanding
24–26	Very Satisfactory
21–23	Satisfactory
18–20	Fairly Satisfactory
1–17	Did Not Meet Expectations

Lesson plan. The lesson plan served as the guide for implementing the Numbered Heads Together strategy in teaching division. It outlined the objectives, procedures, and cooperative learning activities to be used in each session, with the Numbered Heads Together strategy integrated into every lesson. Pupils worked in small groups, discussed division problems, and responded when their assigned number was called. The consistent integration of this strategy through the lesson plan ensured that the intervention was delivered in an organized, systematic, and consistent manner throughout the implementation period.

2.5 Data collection

Before data collection began, the researcher sought formal approval to conduct the study by submitting request letters to the appropriate school and institutional authorities. The researcher first sought approval from the Misamis University Research Ethics Board (MUREB) to ensure compliance with institutional and ethical research standards. The researcher then addressed a formal letter to the Dean of the College of Education at Misamis University. Upon approval, the researcher secured endorsement from the Program Head, followed by submission of a request letter to the Division Office of Ozamiz City. After receiving clearance from the Division Office, the researcher sought permission from the School Principal of the public elementary school where the study was conducted, followed by approval from the Grade Level Head and, finally, the Class Adviser. The researcher obtained each authority's consent before any data collection began. All correspondence included the study's purpose, scope, objectives, and methodology to ensure transparency and adherence to institutional protocols.

After obtaining all necessary permissions, the researcher distributed informed consent forms to the parents or guardians of the 39 officially enrolled Grade 3 pupils, along with assent forms for the pupils. These documents ensured voluntary participation and ethical compliance.

Data collection followed a structured pretest–posttest procedure to determine the effectiveness of the Numbered Heads Together strategy. A pretest was administered before the intervention to measure the pupils' baseline division accuracy and fluency. After the pretest, the researcher implemented the Numbered Heads Together strategy during scheduled mathematics class sessions. In each session, pupils worked in small groups, discussed division problems, and responded when their assigned number was called, with the teacher's guidance.

At the end of the intervention period, the researcher administered a posttest using the same test format but with varied items aligned with the same learning competencies. This allowed the

researcher to compare scores and determine improvements in pupils' division performance. In addition, an engagement observation checklist was used throughout the sessions to document pupils' participation, focus, and cooperation while using the Numbered Heads Together strategy. The consistent use of the test and checklist ensured reliability and objectivity in measuring pupils' progress. The collected data were then organized, tabulated, and analyzed to determine the overall impact of the Numbered Heads Together strategy on pupils' division accuracy and fluency.

2.6 Ethical considerations

Before conducting the study, ethical considerations were carefully observed to protect the rights and overall well-being of all participants. Approval was first sought from the Misamis University Research Ethics Board (MUREB) to confirm that the study adhered to institutional, ethical, and professional research standards. In addition, permission to carry out the study was requested from the School Principal, the Grade Level Head, and the Class Adviser. Their authorization was secured before any data gathering, confirming that the procedures were appropriate and aligned with school policies. Informed consent was strictly implemented for all participants. Parents or guardians of the selected pupils provided written consent, while the pupils gave assent, indicating their voluntary participation in the study. Participants and their guardians were informed of the study's purpose, procedures, potential benefits, and any possible risks. They were also assured that participation was voluntary and that they could withdraw at any time without penalty or disadvantage.

Confidentiality and anonymity were maintained throughout the research process. No personally identifiable information appeared in any report or data set. Each participant was assigned a coded identifier to ensure anonymity. All data, both digital and physical, were stored securely. Digital files were password-protected and encrypted, while printed documents were kept in a locked storage accessible only to the researcher. These safeguarding measures complied with the Data Privacy Act of 2012 (RA 10173), upholding the privacy, dignity, and security of all participants.

The study was carefully designed to avoid harm and minimize risks. All activities, including the implementation of the "Numbered Heads Together," were conducted in a safe, child-friendly, and supportive learning environment. The researcher closely monitored pupils to ensure that no physical, emotional, or psychological discomfort occurred throughout the process. By adhering to these ethical guidelines, the study respected participants' rights while maintaining transparency, integrity, and responsibility in the research process.

2.7 Data analysis

This study used the following statistical tools in analyzing the data gathered with the aid of Jamovi Software.

- Mean and standard deviation were used to determine the level of accuracy and fluency.
- Frequency and percentage were used to present the distribution of pupils across different performance levels based on their pretest and post-test scores.
- A paired sample t-test was employed to determine whether there is a significant difference in the division performance of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy.

2.8 Dissemination plan

The results of the study were communicated to school administrators, cooperating teachers, and the Grade 3 learners and their parents through written reports, focus group discussions, and simplified result summaries. These highlighted how the Numbered Heads Together strategy improved pupils' division accuracy and fluency. When presenting the findings to pupils and parents, the study emphasized ethical procedures such as consent and assent to ensure transparency and responsible implementation.

The findings were also shared with the university community and fellow educators through school-based seminars, research presentations, and classroom demonstrations. These platforms helped promote the importance of cooperative learning strategies, particularly Numbered Heads Together, in improving pupils' division performance. The study was also submitted for inclusion in institutional research repositories to support evidence-based teaching practices in mathematics further.

2.9 Utilization plan

The study results were shared through poster presentations and publications. A research poster highlighting the key findings, conclusions, and recommendations was developed and presented during academic or research dissemination activities within the school or division. This allowed teachers, school leaders, and other stakeholders to easily understand how the Numbered Heads Together strategy improved pupils' division accuracy and fluency and how it could be applied to strengthen mathematics instruction.

In addition, the study was prepared for publication in an academic journal or in the institution's research repository. This ensured wider access to the results and encouraged further research on improving pupils' division performance through cooperative learning strategies. Sharing the findings through both poster presentation and publication supported ongoing efforts to enhance numeracy instruction and promote evidence-based classroom practices.

3 Results and discussion

3.1 Grade 3 learners' division performance before the implementation of the Numbered Heads Together strategy

Table 2 presents the level of Grade 3 learners' division performance before implementing the Numbered Heads Together strategy. Overall, learners' performance was categorized as Did Not Meet Expectations, with an overall mean of 9.47 (SD = 4.57). This finding indicates that learners had insufficient mastery of division concepts and skills before the intervention. The result suggests the need for more engaging and collaborative instructional strategies, such as the Numbered Heads Together strategy, to improve learners' understanding and academic performance in Mathematics.

Among the performance levels, the highest proportion of learners fell under the Did Not Meet Expectations category (n = 34, 89.4%, M = 8.24, SD = 2.88). This was followed by the Satisfactory level (n = 2, 5.3%, M = 21.00, SD = 0.00) and the Fairly Satisfactory level (n = 2, 5.3%, M = 19.00, SD = 0.00). No learners were classified under the Very Satisfactory and Outstanding performance levels before implementing the Numbered Heads Together strategy.

The findings indicate that most Grade 3 learners demonstrated limited mastery of division concepts and problem-solving skills prior to the implementation of the strategy. The large proportion of

learners in the Did Not Meet Expectations category suggests that many learners had difficulty understanding division processes and applying appropriate mathematical operations. Only a few learners reached the higher performance levels, implying that the instructional approaches previously used may not have sufficiently addressed learners' varying needs and learning styles. This pattern highlights the need for interactive and cooperative learning experiences that encourage learners' participation, engagement, and collaboration during Mathematics instruction.

The findings further suggest that learners need more learner-centered and collaborative strategies to strengthen their understanding and performance in division. Cooperative learning strategies improve learners' academic achievement, participation, and mathematical understanding through active interaction and teamwork (Abd Algani, 2021). Likewise, learners exposed to cooperative learning approaches demonstrate better mathematical problem-solving skills compared to those taught using traditional instruction (Istiqlal & Kustianingsih, 2020). Collaborative classroom activities also increase learners' engagement and confidence during Mathematics lessons (Mahmudah & Rasyid, 2022). These findings indicate that the Numbered Heads Together strategy may be an effective intervention for improving learners' division performance and overall understanding of mathematical concepts.

The results suggest the need for instructional enhancement among teachers and school administrators to address learners' low performance in division. Teachers may integrate the Numbered Heads Together strategy more consistently in Mathematics lessons to encourage active participation, cooperation, and critical thinking among learners. Group-based problem-solving activities, peer-assisted learning tasks, and interactive drills may also be conducted to strengthen learners' understanding of division concepts and procedures. School heads may provide professional development programs and instructional support focused on cooperative learning strategies to help teachers improve classroom instruction. Additionally, parents may be encouraged to support learners through regular practice and reinforcement activities at home to improve their mathematical skills and academic performance further. These results suggest the need for instructional enhancement among teachers and school administrators. Teachers may consistently integrate the Numbered Heads Together strategy through group discussions, collaborative problem-solving tasks, and interactive classroom activities to improve learners' participation and comprehension in Mathematics. School heads may also provide instructional supervision, training programs, and learning resources that support the implementation of cooperative learning strategies. Furthermore, activities such as peer tutoring, guided division exercises, and group-based mathematical games may be conducted to help learners strengthen their computational and analytical skills. Parents may likewise assist learners through regular practice and reinforcement activities at home to further improve learners' performance in division.

Table 2. Level of Grade 3 learners' division performance before the implementation of the Numbered Heads Together strategy.

Performance	Frequency	Percentage	M	SD
Satisfactory	2	5.3	21.00	0.00
Fairly Satisfactory	2	5.3	19.00	0.00
Did Not Meet Expectations	34	89.4	8.24	2.88
Overall performance	38	100.0	9.47	4.57

Note: 27–30 (Outstanding); 24–26 (Very Satisfactory); 21–23 (Satisfactory); 18–20 (Fairly Satisfactory); 1–17 (Did Not Meet Expectations).

3.2 Grade 3 learners' division performance after the implementation of the Numbered Heads Together strategy

Table 3 presents the level of Grade 3 learners' division performance after implementing the Numbered Heads Together strategy. Overall, the learners' performance was at the Outstanding level, with an overall mean of (M = 28.60, SD = 0.85). Among the 38 learners, most obtained an Outstanding performance rating (n = 23, 60.5%), with a mean score of (M = 28.60, SD = 0.99). Meanwhile, some learners were classified under the Satisfactory level (n = 8, 21.1%) with a mean score of (M = 22.40, SD = 0.92). This was followed by the Very Satisfactory level (n = 4, 10.5%, M = 24.30, SD = 0.50), while the least number of learners fell under the Fairly Satisfactory category (n = 3, 7.9%, M = 19.00, SD = 1.00). No learners were categorized under the Did Not Meet Expectations level after implementing the Numbered Heads Together strategy.

The findings indicate that implementing the Numbered Heads Together strategy positively influenced the division performance of Grade 3 learners. The high overall mean suggests that most learners understood and applied division concepts effectively after participating in collaborative learning activities. The large percentage of learners who achieved an Outstanding rating further implies that the strategy improved learners' comprehension, participation, and confidence during Mathematics instruction. Moreover, the absence of learners in the Did Not Meet Expectations category may indicate that the strategy effectively addressed learners' previous difficulties in division and supported their academic development. Since learners benefit from active interaction and peer collaboration, the Numbered Heads Together strategy may have provided meaningful learning experiences that enhanced learners' mathematical performance and engagement in class activities.

The findings revealed that the Numbered Heads Together strategy effectively improved learners' Mathematics performance and understanding of division concepts. Cooperative learning approaches enhance learners' academic achievement and engagement by promoting participation and teamwork during classroom discussions (Abd Algani, 2021). Learners exposed to cooperative learning strategies also demonstrate better mathematical problem-solving skills and conceptual understanding compared to those taught using traditional instructional methods (Istiqlal & Kustianingsih, 2020). Furthermore, collaborative learning activities improve learners' confidence, motivation, and classroom participation in Mathematics lessons (Mahmudah & Rasyid, 2022). Similarly, cooperative learning strategies strengthen learners' interaction and accountability within group activities, leading to improved academic outcomes (Tamara, 2025). These findings indicate that the Numbered Heads Together strategy is an effective instructional approach in enhancing learners' division performance and overall mathematical understanding.

The findings imply that teachers and school administrators may continue integrating cooperative learning strategies, particularly the Numbered Heads Together strategy, into Mathematics instruction further to strengthen learners' conceptual understanding and academic performance. Teachers may also design more interactive group activities, problem-solving tasks, and collaborative exercises that encourage active participation and teamwork among learners. Moreover, schools may provide instructional materials, classroom support, and professional development programs focused on effectively implementing cooperative learning strategies. Parents may likewise be encouraged to reinforce learners' mathematical skills at home through guided practice activities and collaborative learning experiences to sustain learners' achievement and interest in Mathematics.

The findings imply that teachers and school administrators may continuously integrate the Numbered Heads Together strategy in Mathematics instruction to strengthen learners' conceptual understanding and academic performance. Teachers may also develop more collaborative and learner-centered activities such as group problem-solving tasks, peer discussions, and interactive Mathematics exercises to sustain learners' participation and interest during lessons. Furthermore, schools may provide instructional materials and conduct seminars or training programs for teachers on effectively implementing cooperative learning strategies in the classroom. Parents may also be encouraged to support learners' learning at home through guided practice and collaborative activities that reinforce division concepts and skills learned in school.

Table 3. Level of Grade 3 learners' division performance after the implementation of the Numbered Heads Together strategy.

Performance	Frequency	Percentage	M	SD
Outstanding	31	81.6	24.00	0.93
Very Satisfactory	7	18.4	20.7	0.49
Overall performance	38	100.00	22.35	0.71

Note: 22–25 (Outstanding); 20–21 (Very Satisfactory); 18–19 (Satisfactory); 15–17 (Fairly Satisfactory); 1–14 (Did Not Meet Expectations).

3.3 Difference in division performance before and after the implementation of the Numbered Heads Together strategy

Table 4 presents the significant difference in the division performance of Grade 3 learners before and after implementing the Numbered Heads Together strategy. The results revealed a very highly significant difference in learners' division performance, as indicated by the computed t-value and p-value ($t = 21.6$, $p < 0.001$). This led to the rejection of the null hypothesis (H_{01}). The mean score increased from before implementation ($M = 9.47$, $SD = 4.57$) to after implementation ($M = 26.05$, $SD = 33.47$), indicating a substantial improvement in learners' division performance.

The significant result suggests that the Numbered Heads Together strategy had a strong positive effect on learners' understanding and performance in division. The large increase in the mean score implies that learners better understood and applied division concepts after participating in cooperative learning activities and group discussions. The strategy may have helped learners become more active, confident, and engaged during Mathematics instruction through peer interaction and shared responsibility in solving mathematical problems. Moreover, the improvement in learners' scores indicates that collaborative learning experiences can strengthen learners' problem-solving abilities and comprehension of mathematical concepts. The findings further suggest that the Numbered Heads Together strategy helped reduce learners' difficulties in division by providing opportunities for discussion, clarification, and guided participation.

Several studies support these findings, emphasizing the effectiveness of cooperative learning strategies in improving learners' Mathematics performance. Cooperative learning activities improve learners' academic achievement and classroom engagement by promoting active participation and teamwork (Abd Algani, 2021). Learners exposed to the Numbered Heads Together strategy also demonstrate better mathematical problem-solving abilities and conceptual understanding compared to those taught using conventional instructional approaches (Istiqlal & Kustianingsih, 2020). Furthermore, collaborative learning strategies enhance learners' confidence, motivation, and participation

during Mathematics instruction (Mahmudah & Rasyid, 2022). Similarly, cooperative classroom activities strengthen learners' collaboration and accountability, which contribute to improved academic outcomes and mathematical performance (Tamara, 2025). These findings indicate that the Numbered Heads Together strategy significantly improves learners' division performance and overall mathematical understanding.

Teachers and school administrators may consider integrating the Numbered Heads Together strategy as a regular instructional approach in teaching Mathematics, particularly in lessons involving division and problem-solving activities. Teachers are encouraged to design collaborative learning activities such as group discussions, peer-assisted problem-solving tasks, and interactive mathematics games that promote learners' active participation and teamwork. School heads may also organize seminars, workshops, and instructional support programs focused on effectively implementing cooperative learning strategies in the classroom. In addition, regular monitoring, remediation sessions, and enrichment activities may be conducted to ensure continuous improvement in learners' mathematical skills and learning outcomes. Parents may likewise support learners through guided practice and reinforcement activities at home to strengthen learners' understanding and mastery of division concepts.

Table 4. Difference in the division performance of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy.

Performance	M	SD	t-value	p-value	Decision
Before the implementation of NHT	9.47	4.57	21.6***	<0.001	Reject H_{01}
After the implementation of NHT	26.05	33.47			

Note: NHT = Numbered Heads Together. ***p < 0.001 (very highly significant); **p < 0.01 (highly significant); *p < 0.05 (significant).

4 Summary and conclusions

4.1 Summary

This study aimed to determine the effectiveness of the Numbered Heads Together (NHT) Strategy in enhancing the division performance of Grade 3 learners in Mathematics at a selected public elementary school in Ozamiz City during the School Year 2025–2026. Specifically, the study sought to determine the level of Grade 3 learners' division performance in terms of accuracy and fluency before the implementation of the Numbered Heads Together strategy, determine the level of Grade 3 learners' division performance in terms of accuracy and fluency after the implementation of the strategy, and identify whether there was a significant difference in the division performance of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy. The study employed a classroom-based action research design using a pretest-posttest approach. Data were gathered through a researcher-made Division Skills Test administered before and after the intervention. Mean, standard deviation, frequency, percentage, and paired-sample t-test were used to analyze the gathered data.

4.2 Findings

This study yielded the following findings:

1. The Grade 3 learners' division performance in terms of accuracy and fluency before the implementation of the Numbered Heads Together strategy was categorized as Did Not Meet Expectations.
2. After the implementation of the Numbered Heads Together strategy, the Grade 3 learners' division performance in terms of accuracy and fluency was categorized as Outstanding.
3. There was a highly significant difference in the division performance of Grade 3 learners before and after the implementation of the Numbered Heads Together strategy.

4.3 Conclusions

Based on the findings of the study, the following are the conclusions:

1. Grade 3 learners demonstrate low mastery of division concepts and skills before the implementation of the Numbered Heads Together strategy.
2. Grade 3 learners demonstrate improved understanding and mastery of division concepts after exposure to the Numbered Heads Together strategy.
3. The Numbered Heads Together strategy significantly improves the division performance of Grade 3 learners in Mathematics.

4.4 Recommendations

Based on the findings and conclusions of the study, it is recommended that:

1. Mathematics teachers may continuously implement the Numbered Heads Together strategy through collaborative discussions, peer-assisted learning activities, and group problem-solving tasks to improve learners' division accuracy and fluency.
2. School administrators may provide instructional supervision, training workshops, and adequate learning resources that support the effective integration of cooperative learning strategies in Mathematics instruction.
3. Learners may actively participate in group activities, classroom discussions, and cooperative learning tasks to strengthen their understanding of division concepts and improve their mathematical performance.
4. Parents may reinforce learners' division skills at home through guided practice activities, monitoring of assignments, and encouragement during Mathematics learning activities.
5. Curriculum planners may incorporate more learner-centered and cooperative learning approaches in Mathematics programs to enhance learners' participation, engagement, and academic achievement.
6. Future researchers may conduct related studies using different Mathematics competencies, larger groups of participants, or other cooperative learning strategies to further validate the effectiveness of the Numbered Heads Together strategy.

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