

# Enhancing the Performance in Science Using the Carousel Learning Strategy in Grade 10 Learners

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DOI: <https://doi.org/10.51584/IJRIAS.2025.1001008>

Received: 25 November 2024; Revised: 08 January 2025; Accepted: 10 January 2025; Published: 30 January 2025

## ABSTRACT

Science education is facing challenges globally, and in the Philippines, innovative teaching methods are crucial to enhance student learning outcomes. This study employed a quantitative classroom-based action research design to assess the effectiveness of the Carousel Cooperative Learning Strategy in fostering students' understanding, engagement, and performance in science through interactive and collaborative learning activities. Conducted during the 2023-2024 academic year in a junior high school in Ozamiz City, Misamis Occidental, Philippines, the study aimed to improve the educational performance of Grade 10 biology students. Participants were selected using purposive sampling based on criteria such as low performance in science. Data collection involved pre-and post-test assessments and lesson plans implementing the Carousel Cooperative Learning Strategy. Descriptive statistics, including frequency, percentage, mean, and standard deviation, were utilized to analyze student performance before and after implementing the strategy, with a t-test employed to determine significant differences. The results revealed a substantial improvement in student performance, increased interest in science, positive group dynamics, and enhanced confidence in understanding science topics following the strategy's implementation. This study emphasizes the importance of innovative teaching methods in addressing challenges in science education. It highlights the effectiveness of interactive and collaborative learning strategies like the Carousel Cooperative Learning Strategy in enhancing student learning outcomes. Educators are encouraged to integrate such approaches to foster student engagement and performance in science education while further research can explore their long-term effects and scalability.

**Keywords:** academic performance, carousel learning strategy, student engagement, collaborative learning

## CONTEXT AND RATIONALE

Learning science can be challenging for students because it involves understanding complex concepts and figuring out the details of scientific principles. It is not just about memorizing things but also grasping complex ideas. Only 22% of students in the Philippines reached Level 2 or above in science. The 2022 PISA results, published by the OECD, revealed that the Philippines scored 373 in science. This suggests a need for improvements in science education to enhance students' overall proficiency and promote advanced problem-solving skills (OECD, 2018).

Globally, science education faces challenges, highlighting the urgent requirement for curriculum reform. It is crucial to clearly define the vision and mission and ensure fairness among stakeholders in the redesign process. This is essential for developing a curriculum that effectively meets the diverse needs of students. Science education is crucial in equipping future citizens with the skills to make informed decisions in a world dominated by science-based discussions. To effectively prepare learners for active engagement in Science, Society, and Issues (SSI) discourse, providing them with an environment conducive to practicing the necessary skills is essential. This includes participating in discussions and gaining a deeper understanding of the scientific content related to specific issues. By integrating skill development and content learning, science

education can empower learners to actively contribute to informed discussions about scientific matters in the contemporary world (Sadler, T.D. 2011).

Students possess a natural curiosity that aligns well with the exploration-focused nature of science education. Science offers a platform for students to engage with their surroundings, fostering the discovery of new things through hands-on labs and experiments. This makes science particularly suitable for younger children, and it serves as a vital building block in the educational foundation of all students. While many acknowledge the necessity of science in education, some perceive it merely as a means to achieve specific goals, potentially overlooking the ongoing importance of continued learning. Despite this perspective, the connection between society and knowledge is inseparable, emphasizing the perpetual need for education to remain integral to societal development (Das et al., 2014).

The landscape of science education in the Philippines underwent a significant transformation with the implementation of the K to 12 curricula in 2012. This substantial revision in the science curriculum responded to external pressures, notably concerns about the Philippines trailing behind other countries in international assessment results, as evidenced by the Trends in International Mathematics and Science Study (TIMSS) (Tirol, 2021). The science curriculum encompasses diverse learning components that contribute to a comprehensive understanding of scientific principles. It incorporates distinct branches such as earth science, delving into the intricacies of our planet's geological processes; biology, exploring the wonders of living organisms and ecosystems; chemistry, signifying the composition and interactions of matter; and physics, comprising fundamental laws governing motion, energy, and the behavior of the physical world. This curriculum aims to provide students with a well-rounded scientific education, fostering curiosity and critical thinking across a spectrum of scientific domains.

Biology is essential for understanding the workings and interactions of living organisms at various levels. Progress in this field has enabled scientists to create improved medicines, treat diseases, assess environmental impacts on plants and animals, ensure sufficient food production for a growing population, and predict how dietary changes or exercise can influence our bodies (Lim, A.& Dutfield, S. 2022).

Incorporating students directly into learning activities through the NHT approach can foster student engagement, inspire participation, and enhance their understanding of science subjects. Consequently, employing the NHT learning model is anticipated to significantly improve student learning outcomes in science topics. Adopting this approach can serve as a strategic move toward offering students more lively, engaging, and effective learning experiences (Hadi & Novaliyosi, 2019). Additionally, it is essential to highlight that the Numbered Head Together (NHT) learning model can positively influence certain aspects of the science learning journey in elementary school. The collaborative nature of students' involvement in group learning activities under NHT may facilitate knowledge exchange and collaborative problem-solving. Within NHT sessions, every student assumes a meaningful role within the group, potentially enhancing their sense of accountability and engagement. Beyond fostering participation, the NHT approach can cultivate students' social competencies, necessitating effective communication, idea-sharing, and peer support (Owens et al., 2020).

Despite these studies, empirical evidence and insights are needed regarding how the carousel cooperative learning strategy influences the academic performance of grade 10 students at one of the secondary public schools in Ozamiz City. To bridge this gap, the researcher would like to implement a carousel cooperative learning strategy in teaching biology to improve the academic performance of grade 10 learners at a particular public school in Ozamiz City, Misamis Occidental, Philippines.

## Strategy

The carousel learning strategy is a dynamic and collaborative teaching approach where students move through different learning stations or activities in a systematic rotation. This strategy is designed to actively involve students in various facets of a topic, offering a comprehensive understanding through hands-on experiences, discussions, and exposure to diverse perspectives. It encourages engagement and interaction, fostering a well-rounded learning experience beyond traditional methods. The carousel learning strategy promotes a more

interactive and holistic approach to education by incorporating hands-on activities and collaborative discussions.

The instructional design was initially introduced to facilitate individual student learning, incorporating some group activities resembling the Carousel model. This cooperative learning strategy aims to actively engage students in small group discussions, encourage movement within the learning space, and promote reflective practices (Al et al., 2017). Cooperative learning has garnered increased attention in recent decades as it has demonstrated its efficacy in enhancing students' interest, fostering critical thinking, nurturing social skills and group reflection, and creating an environment conducive to focusing on receptive and productive skills (Casal, S. 2018).

### **Steps in using the Carousel Learning Strategy**

Implementing the Carousel Learning Strategy involves a structured approach fostering active and collaborative student learning. First, identify the key concepts or topics to be covered in the lesson and break them down into different learning stations. These stations can represent various aspects of the subject matter or different activities related to the lesson. Once the stations are established, divide the class into small groups, ensuring each group is diverse regarding student abilities and backgrounds.

Each group starts at a designated station, and after a set period, they rotate to the next station in a carousel fashion. Students engage in specific activities at each station, such as discussions, hands-on experiments, problem-solving tasks, or multimedia presentations. This rotation continues until all groups have visited each station. The teacher is facilitative, providing instructions, guidance, and support.

The Carousel Learning Strategy encourages active participation, peer interaction, and a comprehensive understanding of the subject matter, making it an effective method for catering to diverse learning styles and promoting collaborative learning in the classroom. Regular assessment and feedback help fine-tune the strategy for optimal learning outcomes.

## **ACTION RESEARCH QUESTIONS**

The study aimed to implement a carousel cooperative learning strategy in teaching biology to improve the academic performance of grade 10 learners.

Specifically, this study sought to answer the following questions:

1. What is the level of performance of the learners before the implementation of the carousel cooperative learning strategy?
2. What is the level of performance of the learners after the implementation of the carousel cooperative learning strategy?
3. Is there a significant difference before and after the implementation of the carousel cooperative learning strategy?
4. What other developments among the learners after the implementation of carousel learning strategy?

## **ACTION RESEARCH METHODS**

### **Research Design**

The researcher used a quantitative approach for this study, employing a descriptive research design. In this approach, numerical data were collected and analyzed to provide a detailed understanding of the implementation of carousel cooperative learning in teaching biology to improve the academic performance of grade 10 learners.

### **Site**

This research was conducted in a junior high school, specifically focusing on Grade 10 students, in Ozamiz

City. The school covers Grades 7 to 12 and provides various curricula, including Regular, Special Science, Arts Program, Technology Vocational Education, and Open High School. Known for its commitment to providing accessible and quality education, the school is dedicated to serving the local community.

### **Participants**

The study participants were the grade 10 students at a particular school in Ozamiz City. The participants were selected using purposive sampling. The participants were selected based on the following criteria: 1.) Students enrolled at a particular secondary institution in Ozamiz City in grade 10 for the academic year 2023-2024; 2.) Students who were observed to have low performance in science; 3.) Students who gave their full consent served as respondents to the study. The researcher checked that all these conditions would be met before conducting the survey.

### **Data Gathering Methods**

#### **Pre-Implementation Phase**

The investigator engaged in a thorough exploration of students' current challenges in learning about contemporary issues. This involves delving into the existing literature, including previous studies, to gain a broader understanding of the research topic. Subsequently, the researcher will initiate the research proposal development and request permission and approval from the principal at the Ozamiz City Junior High School Department to conduct the research. The data collection process and the implementation of interventions will predominantly occur through face-to-face interactions.

#### **Implementation Phase**

During the implementation phase, data collection occurred, encompassing the administration of a pre-test to gather baseline information from the participants. The researcher then actively applied the designated strategy to the respondents within a specified timeframe. Continuous monitoring of participants' performance will take place throughout this period, followed by a post-test assessment. Subsequently, data analysis will be conducted, enabling the researcher to assess the strategy's effectiveness significantly.

#### **Post-Implementation Phase**

The post-implementation phase encompassed concluding, offering recommendations, proofreading, editing, and finalizing the research study. Additionally, it involved effectively disseminating the research results to a specific audience or group of individuals.

### **Ethical Issues**

All research studies ensured the protection of human participants by adhering to appropriate ethical guidelines. Ethical considerations must be addressed at every stage of the study to weigh the potential risks against the anticipated benefits. The proper information must be given to respondents about the research, their involvement, their rights, benefits, and any harm. The ethical aspect of the study was maintained by adhering to the ethical considerations emphasized by the Republic Act No. 10173, otherwise known as the Data Privacy Act of 2021, which highlights the importance of safeguarding individuals' personal information and respecting their rights to privacy and data protection. Also, the study maintained its ethical aspect by following the ethical considerations of (Bryman, Bell, and Harley, 2022).

The respondents were not harmed throughout the study, and their permission was obtained before data collection. Accepting the informed consent form showed that the participants wanted to participate in the study. Furthermore, the research's objectives, advantages, and possible risks were conveyed to the respondents. Participants can opt out of the survey anytime, and we will keep their responses private. Throughout the study, maintaining anonymity and secrecy was of the highest importance. Any misleading information, as well as biased depiction of main data results, was avoided.

## Data Analysis Plan

The researcher used Minitab statistical software. The following processes were performed in the analysis of the data gathered:

The researcher employed statistical tools such as mean, standard deviation, frequency, percentage, t-test, and p-value to evaluate learners' performance before and after implementing the carousel learning strategy.

Thematic analysis was used to explore the other improvements observed after using the carousel learning strategy in teaching science subjects with the aid of Hyper Research software.

## RESULTS AND DISCUSSION

Using carousel activities in teaching science to Grade 10 students improved their understanding, engagement, and performance. This method involves rotating students through interactive stations, each covering a specific topic or activity. By incorporating hands-on experiments, digital tools, visual aids, and discussions, the approach supports various learning styles, encourages collaboration, and simplifies complex concepts into manageable parts.

Table 1. Performance of the Learners Before the Implementation of Carousel Learning Strategy

Performance	Frequency	Percentage	M	SD
Very Satisfactory (VS)	1	2.44	23.00	-
Fairly Satisfactory (FS)	2	17.07	18.571	0.976
Did Not Meet Expectation (DME)	33	80.49	10.394	3.132
Overall Performance	41	100	12.098	4.549

Note: Scale: 17-20 (Outstanding); 15-16 (Very Satisfactory); 13-14 (Satisfactory); 11-12 (Fairly Satisfactory); 1-10 (Did Not Meet Expectation)

### Learners' Performance Before the Use of Carousel Learning Strategy

Table 1 shows the performance of Grade 10 students before implementing the Carousel Cooperative Learning Strategy. With most students needing to meet expectations and a wide spread of scores, there was a clear need for a more effective teaching strategy. The Carousel Cooperative Learning Strategy aimed to address these gaps by engaging students in interactive, hands-on activities and collaborative learning experiences, enhancing their understanding and overall performance in science.

The disparity in performance suggests that while some students excel, others are struggling, underscoring the need for a more effective teaching strategy in science education. Educators could develop approaches that enhance teaching methods and actively involve parents in learning. This dual strategy could help create a more supportive and conducive learning environment, ultimately improving student outcomes in science (Ahmed et al., 2019). It can be conclusively inferred that inadequate instructional materials significantly impede the teaching and learning of Integrated Science. Moreover, the medium of instruction emerges as a substantial hindrance for teachers and pupils in effectively engaging with Integrated Science concepts (Quansah et al., 2019).

The performance of Grade 10 students in science before using the Carousel Cooperative Learning Strategy showed that many students needed to meet expectations, indicating a need for a better teaching approach. The Carousel strategy, which involves hands-on activities and group work, aims to improve understanding and performance in science. Teaching methods could help both struggling and high-achieving students. Additionally, the study implied that the need for more suitable instructional materials makes learning science difficult. Also, using a language that students and teachers understand better can help in teaching science effectively.

Table 2. Performance of the Learners After the Implementation of Carousel Learning Strategy

Performance	Frequency	Percentage	M	SD
Outstanding (O)	16	39.02	28.875	1.544
Very Satisfactory (VS)	8	19.52	23.500	0.756
Satisfactory (S)	3	7.32	21.333	0.577
Fairly Satisfactory (FS)	10	24.39	18.800	0.789
Did Not Meet Expectation (DME)	4	9.76	15.500	0.577
Overall Performance	41	100	23.512	5.001

Note: Scale: 17-20 (Outstanding); 15-16 (Very Satisfactory); 13-14 (Satisfactory); 11-12 (Fairly Satisfactory); 1-10 (Did Not Meet Expectation)

### Learners' Performance After Integrating of Carousel Learning Strategy

Table 2 shows the performance of Grade 10 students after implementing the Carousel Cooperative Learning Strategy. The results demonstrate a significant improvement in student performance, which indicates a high level of understanding and mastery of the subject. The class's overall performance improved notably, indicating a broad yet improved range of scores.

Carousel Cooperative Learning Strategy was considered an effective teaching method for enhancing student performance in science. Promoting active participation, collaboration, and diverse learning experiences helps students grasp complex concepts more effectively. As a result, educators can consider incorporating this strategy into their teaching practices to foster a more engaging and productive learning environment. This method boosted academic performance and encouraged students to develop critical thinking and teamwork skills essential for their future educational and professional endeavors.

Using carousel activities to improve students' writing abilities in descriptive texts provided valuable insights into the significant improvement observed in the current class. The results show increased understanding and mastery, leading to notable class-wide improvements (Avisteva, 2017). Also, the enhanced performance and broader score range indicate the effectiveness of the instructional materials in fostering better understanding and mastery of the subject. Study on instructional materials correlates with the class's notable performance improvement. The materials effectively enhanced understanding and mastery of the subject, reflecting their crucial role in meeting educational objectives and supporting diverse learning needs. This underscores the potential of high-quality instructional resources to drive academic progress in engaging learning environments, as demonstrated by the class's improved outcomes (Jonasky, 2019).

The Carousel Cooperative Learning Strategy significantly improved Grade 10 students' science performance, indicating better understanding. This method fosters active participation and collaboration, enhancing concept comprehension. Educators should adopt this strategy for a more engaging learning environment. Improving instructional materials can also support student learning and overall classroom success.

Table 3. Difference in the Performance of the Learners Before and After the Implementation of Carousel Learning Strategy

Variables	M	SD	t-value	p-value	Decision
Before Using Carousel Cooperative Learning Strategy	12.098	4.549	15.58	0.000	Reject Ho
After Using Carousel Cooperative Learning Strategy	23.512	5.001			

Ho: There is no significant difference in the performance of the students in geometry before and after the use

of tangram.

Note: Probability Value Scale: \*\* $p < 0.01$  (Highly Significant); \* $p < 0.05$  (Significant); \* $p > 0.05$  (Significant);  $p > 0.05$  (Not Significant)

### **Significant Difference in the Learners' Performance Before and After the Use of Carousel Learning Strategy**

Table 3 shows the performance of Grade 10 students before and after implementing the Carousel Cooperative Learning Strategy. Implementing the carousel method had a substantial positive impact on students' performance. The marked increase in average scores and the statistical evidence support the effectiveness of this interactive and collaborative learning approach. The strategy helped improve individual student scores and reduced the variability in performance, indicating a more consistent understanding of the subject matter across the class.

Carousel Cooperative Learning Strategy was considered a powerful tool for enhancing student performance in science. Promoting active participation, collaboration, and diverse learning experiences helps students better grasp complex concepts. By running the activity stations independently, the students demonstrated a high sense of independence, and the teacher-researcher saw that they were actively participating in each one. They showed strong collaboration by working calmly, energetically, and diligently. These observations show that during the activity carousel, the pupils were motivated (Owen & Thomas, 2019).

Implementing the Carousel Cooperative Learning Strategy significantly improved Grade 10 students' performance in science, as shown in Table 3. This interactive and collaborative approach boosted individual scores and made student performance more consistent across the class. The carousel method helps students understand complex concepts better by encouraging active participation and teamwork. The high student autonomy and collaboration observed during the activities indicate strong student motivation. This suggests that incorporating the carousel strategy into science education can lead to better academic outcomes and a more engaging learning experience for students.

### **Development among the Learners after the Implementation of Carousel Learning Strategy**

The Carousel Cooperative Learning Strategy significantly increased students' interest in science by making lessons engaging and fun through hands-on activities and interactive group work. It promoted collaboration and mutual support, helping students learn from each other and enhancing their understanding of the material. Additionally, this approach boosted students' confidence in their science knowledge, making them feel more capable and self-assured.

#### **Increased Interest in Science**

The Carousel Cooperative Learning Strategy significantly increased students' interest in science by incorporating fun and hands-on activities. The interactive lessons made them much more engaging than traditional, boring lectures. The various activities kept the content fresh and exciting, further boosting students' interest. Additionally, group work made learning more enjoyable, allowing students to discuss and learn together. The carousel method made science classes more appealing and engaging for all students.

*My interest in science got a lot higher because the activities were fun. (P1)*

*My interest increased because the lessons were not boring anymore. (P3)*

*I found science more exciting because of the hands-on activities. (P4)*

*My interest in science grew because the carousel activities were fun and different. (P6)*

This strategy made lessons much more engaging compared to traditional lectures. The interactive nature and variety of activities kept the content fresh and exciting, further boosting students' interest in the subject. This

approach enhances academic achievement and fosters more enthusiasm for learning science (Rufon & Forlales, 2022).

The findings suggested that the Carousel Cooperative Learning Strategy effectively increased students' interest in science by incorporating fun, hands-on activities and interactive lessons. This approach made science classes more engaging compared to traditional lectures, leading to higher student enthusiasm and motivation. The carousel method boosted academic achievement and cultivated a lasting interest in science by fostering a collaborative learning environment where students could discuss and learn together. Educators should consider integrating such interactive and varied activities into their teaching practices to enhance student engagement and improve learning outcomes.

### **Positive Impact of Group Work**

Group work positively influenced students' learning experiences, fostering collaboration and mutual support. Through teamwork, students learned from each other, enhancing their understanding of the material. Working together made lessons more enjoyable and facilitated more accessible learning, as students could assist and explain concepts to each other. The exchange of ideas and joint problem-solving activities further deepened their comprehension. Group work created a supportive and collaborative learning environment that benefited all participants.

*Working in groups helped me learn from my friends and made the lessons more enjoyable. (P1)*

*It was great because we shared ideas and solved problems together. (3)*

*Working in groups was helpful because we could talk about the topics and help each other. (P8)*

In the carousel-style lessons, students engaged in teamwork, fostering collaboration and mutual support. This method allowed students to learn from each other, enhancing their understanding of the material. By working together, students found lessons more enjoyable and learned more efficiently, as they could help and explain concepts to each other (Owen & Thomas, 2019).

The findings suggested that group work positively influenced students' learning experiences by fostering collaboration and mutual support. Through teamwork, students learned from each other, which enhanced their understanding of the material. Working together made lessons more enjoyable and facilitated more accessible learning, as students could assist and explain concepts to each other. The exchange of ideas and joint problem-solving activities further deepened their comprehension. Group work created a supportive and collaborative learning environment that benefited all participants. This implied that incorporating group work into lessons could improve student engagement, enjoyment, and comprehension of the material.

### **Increased Confidence in Understanding Science Topics**

Students reported feeling more confident in understanding science topics after participating in the Carousel Cooperative Learning Strategy. They expressed feeling better able to grasp the material and felt more assured about their answers. The interactive and engaging nature of the activities allowed them to practice and learn in a fun way, which contributed to their increased confidence. More precise explanations and easier-to-understand lessons also boosted their confidence in their knowledge. Overall, the carousel method enhanced students' confidence in understanding science concepts, making them feel more capable and surer of themselves.

*Yes, I felt a lot more confident because I could understand the topics better. (P1)*

*Yes, I felt more sure of myself because I could learn in a fun way. (5)*

*Yes, I felt more confident because the lessons were clearer. (8)*

*Yes, I felt more confident because I could see the topics in different ways. (P10)*



The carousel activities enhanced students' writing skills, and the interactive and engaging nature of the carousel strategy in science allowed students to practice and learn in a fun way. This hands-on approach helped them grasp the material better and feel more assured about their answers, increasing their confidence in their understanding of science topics ( Avisteva, 2017).

The findings suggested that the Carousel Cooperative Learning Strategy significantly boosted students' confidence in understanding science topics. Students felt better able to grasp the material and more assured about their answers. The interactive and engaging nature of the activities allowed them to practice and learn in a fun way, contributing to their increased confidence. More precise explanations and easier-to-understand lessons also played a role in boosting their confidence. This implied that incorporating the carousel method into science education could enhance students' confidence in understanding science concepts, making them feel more capable and self-assured.

## **SUMMARY, FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS**

### **Summary**

Learning science can be challenging, especially for students who understand complex concepts rather than memorize information. In the Philippines, where only 22% of students reached Level 2 or above in science proficiency, there is a clear need for improved science education. Implementing the K to 12 curriculum aimed to address this issue, but challenges remained, necessitating innovative teaching strategies. The study conducted in a junior high school in Ozamiz City, Misamis Occidental, Philippines, during the academic year 2023-2024, aimed to enhance the academic performance of Grade 10 students in biology by implementing the Carousel Cooperative Learning Strategy. The study's results demonstrated the effectiveness of the Carousel Cooperative Learning Strategy in enhancing students' understanding, engagement, and performance in science. Through interactive and collaborative activities, students significantly improved their academic performance. Moreover, the strategy increased students' interest in science, fostered positive group dynamics, and boosted their confidence in understanding science topics. In conclusion, the study underscores the importance of innovative teaching strategies in enhancing student learning outcomes in science education.

### **Findings**

Before implementing the Carousel Cooperative Learning Strategy, Grade 10 students exhibited a concerning level of performance, with the majority scoring below the acceptable level. This highlighted a significant challenge in the effectiveness of traditional teaching methods in engaging students and facilitating understanding of science.

After engaging with the carousel method, students showed a high level of understanding and mastery of the subject, indicating its effectiveness in enhancing student performance in science.

Statistical analysis confirmed a significant difference in student performance before and after implementing the Carousel Cooperative Learning Strategy. Implementing the carousel method led to substantial improvements in student performance, highlighting its effectiveness as a teaching approach.

Implementing the Carousel Cooperative Learning Strategy improved students' science performance and positively impacted their interest in the subject. Students reported increased engagement and enjoyment in science lessons, attributing this to the interactive and hands-on nature of the carousel activities. Promoting active participation, collaboration, and diverse learning experiences addressed the challenges posed by traditional teaching methods and provided a more effective and enjoyable learning environment for students.

### **Conclusions**

1. Before implementing the Carousel Cooperative Learning Strategy, Grade 10 students needed help to meet expected performance levels in science. This underscored the limitations of traditional teaching methods in effectively engaging students and facilitating their understanding of science concepts.

2. Engaging with the carousel method significantly improved students' understanding and mastery of science topics. This indicates the effectiveness of the carousel approach in enhancing student performance in science education.

3. Statistical analysis confirmed a substantial difference in student performance before and after implementing the Carousel Cooperative Learning Strategy. The statistically significant improvement highlights the efficacy of the carousel method as a teaching approach.

Beyond academic performance, the carousel strategy positively impacted students' interest and engagement in science. Students reported increased enjoyment and active participation in science lessons, attributing this to the interactive and hands-on nature of the carousel activities.

### Recommendations

1. Teachers may continue using the Carousel Cooperative Learning Strategy because it helps students learn science better. Many students struggled with science before using the carousel method but improved significantly after using it. Teachers should use the carousel method to make learning science more enjoyable.

2. The activities in the carousel are interactive and hands-on, which students liked. This made them more engaged and excited about learning science. It is also essential for students to work together in groups during carousel activities. This helps them learn from each other and makes learning more enjoyable.

3. Teachers may change and improve how they use the carousel method based on what works best for their students. The carousel method can be adjusted to fit the needs of students and their classrooms. Teachers should get training on how to use the carousel method well. This will help them understand how to make science fun and engaging for their students.

4. Using the Carousel Cooperative Learning Strategy in teaching science can help students learn better and enjoy science more. Teachers should keep using it and finding ways to improve it for their students. Future researchers can also study more about how effective the carousel method is and how it can be improved.

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