

The Integration of Manipulatives and Cooperative Learning in the Learning Measurement of Grade Four Bhutanese Students

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Abstract

The objectives of this study were to investigate the effectiveness of the integration of manipulatives and cooperative learning strategies on grade four Bhutanese students' learning achievement in measurement and to explore their perceptions towards it. Quantitative data was gathered through pretest and posttest, and qualitative data was gathered through semi-structured interviews. The quantitative data was then analyzed using paired sample t-test and the qualitative data was analyzed using thematic analysis. The data analysis showed a significant improvement in students' posttest scores compared to the pretest scores. The mean (\bar{x}) difference ($\bar{x} = 9.67$) between posttest ($\bar{x} = 16.67$) and pretest ($\bar{x} = 7.00$) indicated that the use of manipulatives and cooperative learning strategies improved the learning achievement of students. Similarly, analysis of semi-structured interview data revealed that the students developed positive perceptions towards the use of manipulatives and cooperative learning strategies in learning mathematics. Therefore, the results of the pretest, posttest and semi-structured interviews demonstrated that the integration of manipulatives and cooperative learning strategies was effective in learning measurement for grade four Bhutanese students.

Keywords: Manipulatives, Cooperative learning, Mathematics, Grade four, Measurement

Introduction

Mathematics serves as a backbone to all the technological advancements in the world. There can be no meaningful development in this modern world of technology without adequate and sufficient knowledge of mathematics. Mathematics is considered as an essential subject in our life. According to Hom (2013), mathematics is the building block for everything that we do in our daily life. It deals with the logic of shape, quantity, and arrangement. Furthermore, Kusmaryono (2014) states that as a branch of science mathematics has a profound contribution to the advancement of science and technology. According to Tshewang (2015), the Bhutanese education system started its own mathematics curriculum only since 2006 although the modern education system started in the country as early as the 1960s. Mathematics is considered as a major and compulsory subject from classes PP to X and students are required to pass this

subject in order to be promoted to higher classes. Drukpa (2015) rightly points out that mathematics is considered as a major and compulsory subject in the Bhutanese curriculum.

Mathematics in the past was taught with the use of traditional methods, where the emphasis was on memorization of basic facts such as multiplication tables, formulas and study examples. Content coverage was the focus rather than students learning the subjects. Another reason was due to the students' attitude towards learning the subject. The performance of students was worse for those who found mathematics difficult and boring when compared to those who liked the subject (BCSEA, 2019). A positive attitude can motivate students' critical thinking. Therefore, being active in the classroom, working together in groups, and improving interaction and communication skills can boost the performance of a particular subject especially Mathematics (Setapa et al., 2016)

As per the study carried out by Willingham & Vang (2017) the achievement of students in mathematics was improved with the use of manipulatives, increasing the understanding and development of a positive attitude towards the mathematical concepts. In the early developmental stage children learn effectively when they move from concrete to abstract which is facilitated by the use of manipulatives. It is also stated that students are actively, engaged and interested when manipulatives are used in the lessons. Therefore, the use of manipulatives can help young children in developing a positive attitude towards learning mathematics.

According to the study conducted by Carbonneau et al. (2020), the integration of manipulatives and cooperative learning helped students to work in groups, which enhanced the students' mathematical skills such as problem solving, developed a positive attitude towards learning, improved the students' performances, and developed critical and analytical thinking skills.

Hossain and Ariffin (2018) state that cooperative learning strategy is one of the important strategies that helps in producing a high degree of academic results as compared to other forms of instructional methods. It helps in the process of learning from each other to enhance academic achievements.

Similarly, Bryan (2017) states that the test scores of students increase with the integration of manipulatives and cooperative learning strategies. Therefore, the integration of manipulatives and cooperative learning strategies are useful tools for enabling students to be inspired and motivated to learn mathematics which would lead to better test score. The integration of manipulatives and cooperative learning leads to the interaction of the students with objects that help them to develop problem solving, logical reasoning, and communication skills and develop the ability to think abstractly. Nevertheless, teachers play an important role in facilitating and improving students' achievement in mathematics through the use of cooperative learning strategies in the classrooms (Gillies, 2016).

Literature review

According to Dolma (2016), the modern education system in Bhutan came into existence in the 1960s. However, the Bhutanese education system started its own mathematics curriculum since 2006. Then in the year 2016, a curriculum review took place on the theme- "Re-thinking Curriculum," as a major exercise with the hope to create a curriculum that was more responsive to the needs of the students in the 21st century (REC, 2016). Furthermore, the

incorporation of cooperative learning and the use of manipulatives can students to acquire better knowledge of mathematics by learning faster and easily with enjoyment.

Teaching with manipulatives helps individuals to perceive and understand mathematical concepts through practical experience (Griffiths et al., 2017). The use of manipulatives in the learning of mathematics helps students develop self-esteem, creativity, and confidence. It is very useful in scaffolding the students to build mastery in mathematics, which leads to a sense of achievement by the students (Munday, 2019). The use of Manipulatives helps students build a foundation in mathematics as they have hands-on experience and can build connections amongst the different aspects of mathematical skills, which builds confidence to complete difficult tasks and problems.

Another important learning technique that has been useful for improving performance in mathematics is cooperative learning strategies. According to Lewis (2019) Johnson and Johnson (2018), cooperative learning is defined as the instructional strategy in which small groups of students work together to accomplish shared learning goals. Cooperative learning by its nature is a very active learning method. Moreover, cooperative learning is a student-centered and instructor-facilitated instructional strategy in which a small group of students are responsible for its learning and the learning of all group members.

Measurement is a process whereby we are able to describe the world with the help of numbers. Numbers are used to describe different things such as weight, length, temperature, volume, area, and perimeter. Through the use of measurement, we are able to know about the world around us. In terms of mathematical measurement, it is considered as one of the important tools that provide a useful connection between the real world and mathematics. It is a process or a technique where the properties of an object are determined by comparing them to a standard. Measurements can be used to determine length, weight, perimeter, area, volume, mass, and temperature. For measurement, some units and formulas are used to find out different things.

Similarly, Chakraborty (2016) emphasizes that measurement plays an important role in describing and understanding length, weight, capacity, area, and perimeter. It is one of the basic concepts of mathematics. It is always important to measure something correctly; for example it is important to have accuracy with distance and time which can be possible only through measurement. We are in a better position to understand the world around us through measurements. The outcome of measurements can be a good guide for us to make right decisions.

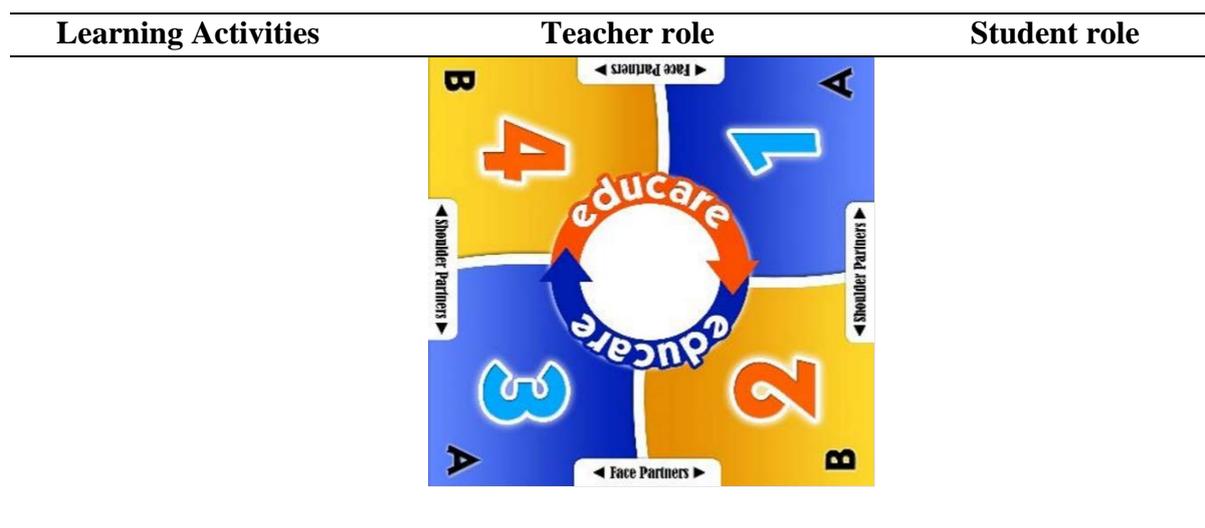
Use of manipulatives with cooperative learning strategies to teach mathematics in a classroom

According to Farmer (2017) the use of Kagan's structure supports student engagement, and it is effective for solving mathematical problems. Among the many cooperative learning structures, the researcher emphasized RallyTable and RoundTable for this study. According to Kagan (2009), RallyTable can be applied with textbook activities, question sheets, oral questions or board work particularized by the teacher. In pairs, students take turns; one student solves a problem while the other observes and helps when necessary. Roles are then switched. Therefore, in the course of practice, the pairs combine their power of understanding and assist

each other whenever necessary. In RoundTable, each student gets to brainstorm in a group by expressing and solving the question provided by the teacher since they pass the same paper around until everyone in the group has a chance to solve it. According to Khadafi (2017), RoundTable can be utilized across all subjects and all levels of students. Incorporating this structure right from primary school level can help to develop basic social skills such as listening, sharing, taking turns, thanking each other and decision making. A summary of the integration of manipulatives and cooperative learning is shown in the table below.

Table 1 Manipulatives and cooperative learning

| Learning Activities | Teacher role | Student role |
|---|--|---|
| Manipulatives Demonstrate measuring an area using a geo- board, rubber bands and a square grid. Carry out the activity using manipulatives such as a geo-board, rubber bands, and a square grid to find the area. Demonstrate finding the perimeter using different methods (geo- board, square grid, interlinking cubes and tiles). | Make sure materials are ready before activity. Provide materials to each group. Demonstrate how to use the manipulatives. Give instruction on how to use the manipulatives. Walk around and help students if necessary. | Observe the demonstration and use manipulatives as per the teacher's instructions. Choose which manipulatives to use for solving the problems. |
| Cooperative Learning Find the area in pairs using a geo-board, rubber bands and a square grid. (<u>Either shoulder partner or face partner can work together</u>) Have students in groups find the perimeter using any of the manipulatives (geo-board, square grid, interlinking cubes, and tiles). | Pair-up students, and have them do the activities either with their face partner or shoulder partner. Divide the students in groups of four members each. Number them from 1-4. Have them sit as per the sitting plan shown in the picture below whereby numbers 1 and 2 are shoulder partners and numbers 1 and 4 are face partners. | Take turns to solve the problem with partners. In Round-Table take turns in teams to solve the problems. |



Related research studies

There are many research studies showing the effectiveness in the use of manipulatives and cooperative learning strategies in teaching mathematics. Karali and Aydemir (2018) examined students' achievement in academics and their attitude towards mathematics through the use of cooperative learning methods. The analysis of the data indicated that students' academic achievement was high and students' attitude towards mathematics was enhanced while using cooperative learning strategies. Similarly, Larbi and Mavis (2016) researched on the efficacy of using manipulatives in Junior High school at the Komenda Edina Eguafu Abirem municipality. It was observed that the use of manipulatives enhanced students' thinking process and was effective in enabling students' performance in mathematics. Likewise, there are many other related research that reveal improvements in mathematics using manipulatives and cooperative learning Strategies. Therefore, the use of these strategies has been proven to be very helpful and develop confidence, which improves problem-solving skills in students.

Research objectives

1. To study the effectiveness of integration of mmanipulatives and cooperative learning strategies on grade four Bhutanese students' learning achievement in measurement.
2. To examine grade four Bhutanese students' perception towards integration of Manipulatives and Cooperative learning in learning measurement.

Research question

1. How effective was the integration of manipulatives and cooperative learning strategies on grade four Bhutanese students' learning achievement in measurement?
2. How would grade four Bhutanese students perceive towards the integration of manipulatives and cooperative learning in learning measurement?

Conceptual framework

The integration of manipulatives and cooperative learning was an independent variable whereas the students' learning achievement and students' perceptions towards the use of manipulatives and cooperative learning were dependent variables.

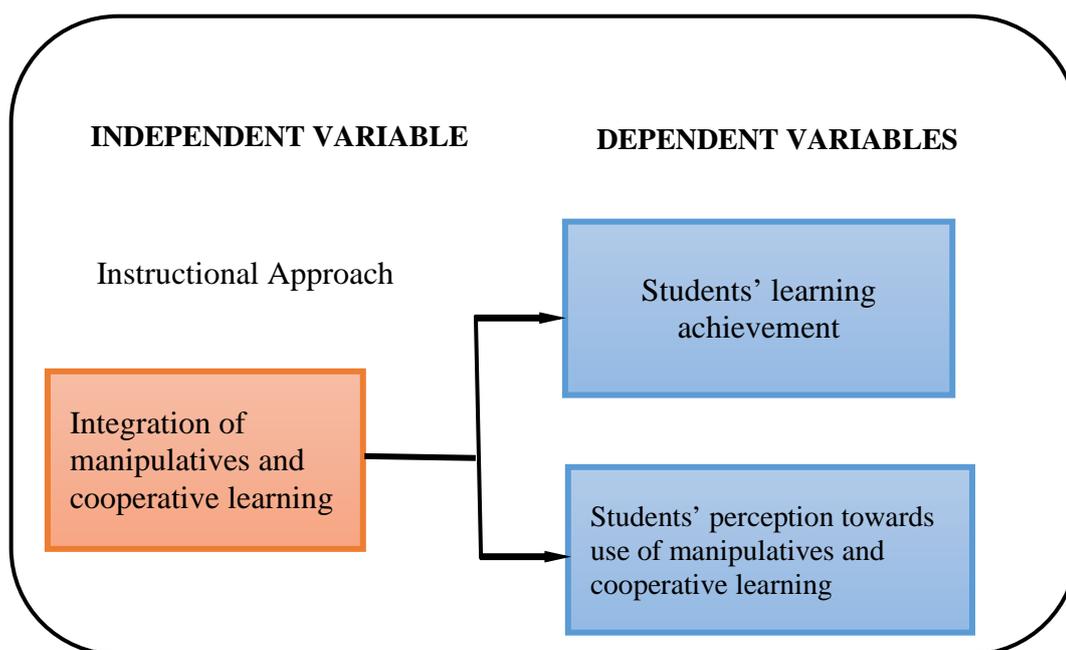


Figure 1 Independent variable and dependent variables

A mixed method approach was used in this study. The pretest and posttest were used to collect quantitative data in order to determine the learning achievement, while semi-structured interview were conducted for collecting qualitative data on students' perception towards the use of manipulatives and cooperative learning.

Methodology

Research participants

The total participants in the study consisted of 34 students (19 boys and 15 girls) studying in grade four in one of the middle secondary schools in Eastern Bhutan. Since there was only one section of grade four, all of them participated in the study. Their age ranged from 10 to 11 years with mixed genders and abilities in mathematics.

Research instruments

In this study, three instruments were used to collect the data. The instruments included four lesson plans, learning achievement tests (pretest and posttest), and semi-structured interviews. The researcher made four lesson plans of 90 minutes each (1 lesson plan for 2 sessions) to teach the topic 'Measurement' from the grade four mathematics curriculum. The lesson was taught incorporating manipulatives and cooperative learning strategies. The session consisted of two periods in a week for a duration of four weeks which totaled up to eight periods in a month. The learning achievement test (pretest) was conducted before the lesson to examine the baseline knowledge of the students while the posttest was conducted to assess how much students have learned after the delivery of the lesson. A set of questions consisted of multiple-choice questions and short answer question with the weightage of 20 marks, of which 10 marks was allotted to multiple question while another 10 marks were allotted to the short answer questions. The semi-structured interviews were conducted at the end of the study with 34

students. All the students participated to ensure that there was no bias in the collection of data. Five open-ended interview questions were framed to examine the students' perceptions towards the integration of manipulatives and cooperative learning strategies.

Validity

All the instruments for this study were tested for validity by three experts. The Item Objective Congruence (IOC) was calculated by using a statistical formula. Every item of the research instruments was rated +1 by all the three validators in education with some comments for further improvement. They assessed the language clarity, applicability, and content coverage of the instruments as per the research objectives.

Reliability

To check the reliability of the achievement test, the researcher conducted a pilot test with a different group in the same research school. The achievement test questions consisted of 5-mark multiple choice questions and 5-mark short-answer questions. After that, the Kuder-Richardson formula (KR-20) was applied to find out the reliability coefficient of the learning achievement test. The result showed a score of 0.75, which was an indication that the test items were reliable.

Results and findings

The paired sample t-test was used for statistical analysis of the learning achievement test. Comparisons were made based on the mean, significant value and standard deviation. The differences in student learning achievement by comparing the pretest with the posttest were determined.

Data analysis of students' learning achievement

To answer the first research question, "How effective is the integration of manipulatives and cooperative learning strategies for grade four Bhutanese students' learning achievement in measurement? Quantitative data was collected from the pretest and posttest and analyzed using the paired sample t-test.

Table 2 Individual student's pre-test, post-test and improvement scores

| Student Number | Pretest Score 20 | Posttest Score 20 | Improvement Scores |
|-----------------------|-------------------------|--------------------------|---------------------------|
| 1 | 6 | 14.5 | +8.5 |
| 2 | 8 | 18.5 | +10.5 |
| 3 | 6 | 15.5 | +9.5 |
| 4 | 4 | 17 | +13 |
| 5 | 10 | 16 | +6 |
| 6 | 8 | 17.5 | +9.5 |
| 7 | 9 | 13 | +4 |
| 8 | 4 | 16 | +12 |
| 9 | 7 | 15.5 | +8.5 |

| Student Number | Pretest Score 20 | Posttest Score 20 | Improvement Scores |
|---|------------------|-------------------|--------------------|
| 10 | 10 | 15 | +5 |
| 11 | 4 | 17.5 | +13.5 |
| 12 | 4 | 18 | +14 |
| 13 | 4 | 19 | +15 |
| 14 | 7 | 15 | +8 |
| 15 | 9 | 16.5 | +7.5 |
| 16 | 11 | 19.5 | +8.5 |
| 17 | 4 | 16 | +12 |
| 18 | 6 | 17 | +11 |
| 19 | 7 | 19 | +12 |
| 20 | 9 | 13 | +4 |
| 21 | 7 | 17 | +10 |
| 22 | 7 | 17.5 | +10.5 |
| 23 | 4 | 18 | +14 |
| 24 | 8 | 17.5 | +9.5 |
| 25 | 13.5 | 19.5 | +6 |
| 26 | 7 | 16.5 | +9.5 |
| 27 | 4 | 15 | +11 |
| 28 | 6 | 20 | +14 |
| 29 | 8.5 | 17 | +8.5 |
| 30 | 3 | 18 | +15 |
| 31 | 6 | 13 | +7 |
| 32 | 10 | 20 | +10 |
| 33 | 9 | 15 | +6 |
| 34 | 8 | 14 | +6 |
| Mean (\bar{X}) scores | 7.00 | 16.67 | 9.67 |

Table 2 shows the students' pretest and posttest scores. The scores showed an improvement in the performance of the students after teaching using manipulatives and cooperative learning strategies. In the pretest, the highest score of the student was 13.5 and the lowest score was 3 whereas the highest score of the students was 20 and the lowest score was 13 in the posttest. Student numbers 30 and 13 showed a huge improvement with a difference of 15 points, while student number 7 showed the lowest increase of 4 points. The results showed that the posttest scores were higher than the pretest scores.

The mean (\bar{X}) scores of the pretest and posttest were 7.00 and 16.67, respectively, resulting in a mean (\bar{X}) difference of 9.67. This exhibited that all students improved in their learning achievement during the posttest.

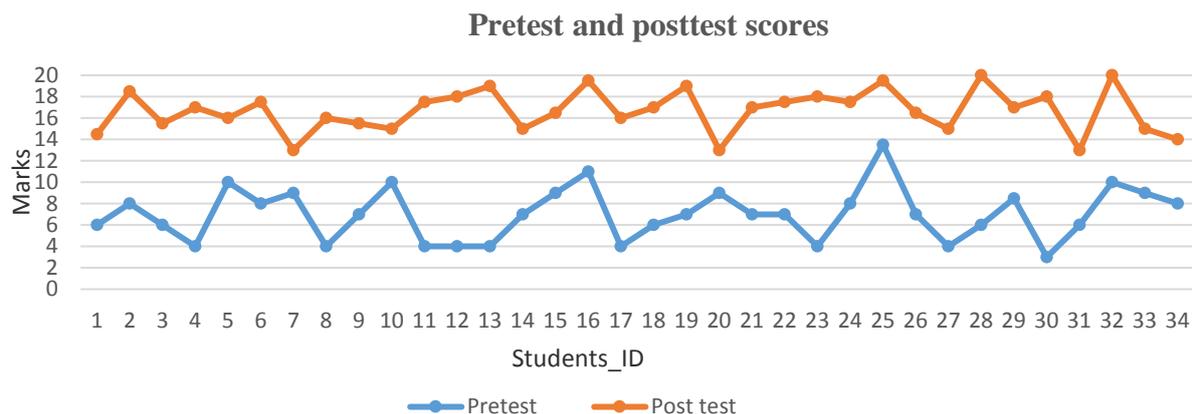


Figure 2 Pretest and posttest scores of students

There were 34 students who participated in this study. Since there was only one section of grade four, all of them participated in the study. The above figure represents the pretest and posttest scores of the students after teaching mathematics using manipulatives and cooperative learning strategies.

Table 3 Comparison of the pre-test and post-test: paired sample t-test

| | Pre-test | | Posttest | | Mean Difference | P Value |
|--------------|----------|------|----------|------|---------------------|---------|
| | Mean | SD | Mean | SD | | |
| Sample Group | 7.00 | 2.46 | 16.67 | 1.97 | 16.75 - 7.00 = 9.67 | 0.000 |

Significance level (p) : < 0.05 demonstrates significance

Based on the paired sample t-test in Table 3 the statistical data shows that the pretest mean score on learning achievement was 7.00 with a standard deviation of 2.46, while the posttest mean score was 16.67 with a standard deviation of 1.97. The results of the P-value .01 shows a statistically significant gain that indicated significant increase in scores on the posttests as compared to the pretest. For the study to be significant the P value should be less than 0.05.

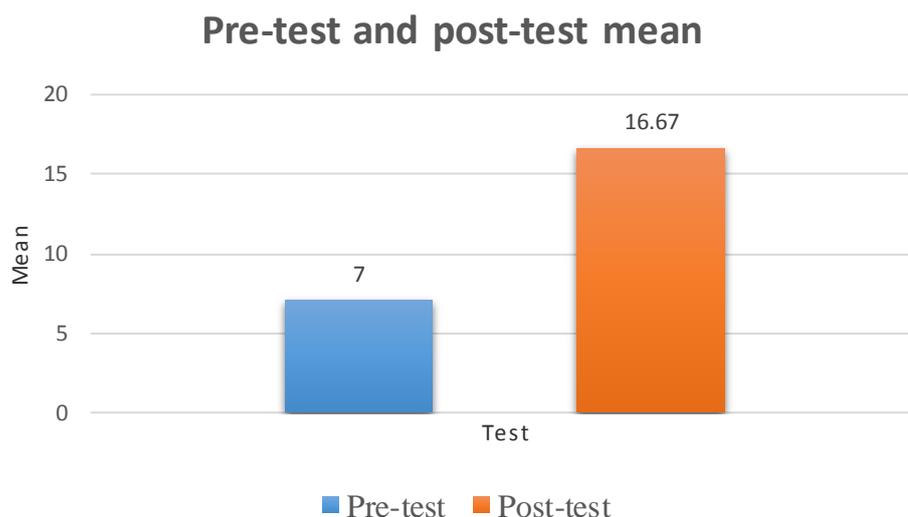


Figure 3 pretest and posttest mean (\bar{X}) comparison

From the comparison: the mean (\bar{X}) score of the posttest (16.67) was higher than that of the pretest (7.00). This indicated that there was a rise in the posttest scores compared to the pretest scores after the use of manipulatives and cooperative learning strategies. The blue bar represents the pretest mean score and the orange bar represents the posttest mean score of the students' learning achievement.

Analysis of the semi-structured interview

The interview were conducted at the end of the study with 34 grade four students in pairs. Five open-ended questions were framed to examine the students' perceptions towards the integration of manipulatives and cooperative learning strategies. The questions were then assessed and validated by the three experts. The data from the students' interview responses were recorded and translated in English for data analysis. The data was analyzed using a six steps approach (thematic analysis) which was introduced by Braun and Clarke (2006, as cited in Caulfield, 2020).

The data from the students' interviews were analyzed and categorized into five themes: 1) enjoyment, 2) developing learning interest, 3) understanding concepts 4) learning through collaboration and 5) fun to learn. Most students gave positive responses in using manipulatives and cooperative learning strategies in learning mathematics. It was encouraging to note that many students enjoyed learning mathematics while manipulative were used during the teaching-learning process. According to the responses, all the students expressed that they enjoyed learning mathematics using manipulatives. They shared that using manipulative motivated them to learn mathematics better. The reaction of students towards the use of cooperative learning strategies was no different and the integration of the two (i.e., manipulative and cooperative learning) was even better. It was found that almost all the students developed interest for learning mathematics since they could help each other and solve the problems in groups, which in turn build their confidence in learning mathematics.

Cooperative learning strategy is the strategy where the involvement of all the students is a must. Children generally learn better when they are involved actively. The students shared that they were able to understand the concepts quickly, and working with friends gave them the opportunity to share their ideas. Moreover, the use of manipulative and cooperative learning strategies helped them to remember the lesson for a longer duration. It was a good experience for the students to use manipulatives and cooperative learning strategies in the learning of mathematics. Given the advantage associated with the use, it is good to encourage our colleagues to strive for the integration of such strategies. The responses of the students indicated that using different manipulatives made the learning of mathematics fun and supplemented the learning process with greater exploration through a hands-on experience, which helped them to learn more easily and faster. During the use of cooperative learning strategies, the students were able to help each other in their groups. The learning was made fun which helped them develop interest for learning. They were able to solve the mathematical problems more easily when they were working in teams; for example, their classmates helped them in finding the area and perimeter using manipulatives. Generally, in groups the questions were rephrased by peers so as to promote understanding for all members, and they collaborated together to complete the work successfully.

Therefore, based on the interviews and questionnaires, the students were able to understand and learn mathematics better when manipulative and cooperative learning strategies were used. Consequently, any teacher teaching mathematics should use manipulatives and cooperative learning strategies so that our children can develop a taste for learning mathematics and so that mathematics can become a preferred subject choice.

Conclusion and discussions

The study had two major objectives. The first objective was to find out the effectiveness of integration of manipulatives and cooperative learning strategies on grade four Bhutanese students learning achievement in measurement. The second objective was to examine grade four Bhutanese students' perceptions towards integration of manipulatives and cooperative learning in measurement. To achieve the objectives, the quantitative data was collected through achievement tests and qualitative data was collected through semi-structured interview. According to the results of the study, there were two major findings.

Result of test score analysis

A comparative statistical analysis using paired sample t-test was carried out within the sample group to see the differences in the level of achievement between pretest and posttest. It was found that the mean score of the pretests was 7.00 which increased to 16.67 in the posttest, with a mean difference of 9.67. The difference in the mean score indicated that the students performed better in the posttest as compared to the pretest.

Result of the semi-structured interview data analysis

The second objective of the study was to examine grade four Bhutanese students' perceptions towards the integration of manipulatives and cooperative learning in learning measurement.

The semi-structured interviews were carried out at the end of the study with 34 students. Five open-ended interview questions were framed to examine the students' perceptions towards the integration of manipulatives and cooperative learning strategies. It was evident that the students had a positive perceptions towards the use of manipulatives and cooperative learning. The students expressed that they enjoyed the lessons when taught using manipulatives and cooperative learning strategy. They stated that the use of manipulatives not only engaged them, but also helped them to develop interest in learning mathematics. They also shared that solving mathematical problems became much easier with the use of manipulatives while also getting help from classmates through the use of cooperative learning strategies. Many students mentioned that they understood the concepts better when they learned and taught each other in groups. They were also motivated during the activities as they felt comfortable learning from their peers than through the teacher.

Discussions

The study had two major objectives. The first objective was to find out the effectiveness of integration of manipulatives and cooperative learning strategies on grade four Bhutanese students learning achievement in measurement. The second objective was to examine grade four Bhutanese students' perceptions towards the integration of manipulatives and cooperative learning strategies in the learning measurement.

Students' learning achievement

Data collected through the learning achievement of grade four students by administering, pretest and posttest before and after the use of manipulatives and cooperative learning with a sample group of 34 students. The findings revealed that the posttest mean score ($\bar{x} = 16.67$) was significantly higher than the pretest mean score ($\bar{x} = 7.00$) with the mean difference of 9.67. The significance value (P) was 0.00. These findings indicated that there was an increase in the learning achievement of the students in mathematics after the use of manipulatives and cooperative learning strategies.

The above finding align with the findings of Sudihartinih (2020), and Syam et al. (2018) who carried out studies on the use of manipulatives and cooperative learning strategies which demonstrated an improvement in students' mathematics learning outcomes. Similarly, Kane (2018) studied the use of cooperative learning strategies and it was found that the use of these strategies students learn mathematics, build confidence, and develop social skills along with a sense of collaboration. The finding was parallel to the studies conducted by Karali & Ayemir (2018), who found high academic achievement and enhancement of attitude towards mathematics for those who were taught using cooperative learning methods. The study carried out by Agujar (2018) supported the fact that providing opportunity to the students in making use of manipulatives helped them understand and learn basic mathematical skills better.

The findings were also supported by Liggett (2017) and Allen (2017), who stated that the use of manipulatives helped students in improving and developing problem solving skills. It was also found that students were actively involved in the learning process and thereby helping them improve their learning achievements. The study conducted by Graham (2013) found a positive perception towards learning mathematics which was the result of a teaching

learning process that integrated the use of manipulatives and cooperative learning strategies. All the findings mentioned above reveal that the use of manipulatives and cooperative learning strategies helped in bringing about improvements in increasing the learning scores of students in mathematics.

Students' learning perception

The second major objective of the study was to examine grade four Bhutanese students' perception towards integration of manipulatives and cooperative learning in measurement. The semi-structured interviews that were carried out at the end of the study to find the students' perception towards the use of manipulatives and cooperative learning in measurement. The data collected was analyzed using the thematic analysis technique. The positive impacts included enjoyment, interest in learning, fun to use, understanding concepts and learning through collaboration; all of these impacts resulted in better performance in the subject. Almost all students enjoyed the mathematics session while using manipulatives and cooperative learning strategies during the period of teaching and learning session.

Similarly, the studies conducted by Graham (2013) pointed out that there was a positive social change and better understanding of mathematical concepts while using manipulatives. During the class activity, students were found participating actively in the class by responding to the questions, clarifying their doubts, sharing the information with classmates and teachers and helping their classmates. It was also noticed that they were confident and could openly share their concerns with the teachers and their classmates.

The study conducted by Charbonneau et al. (2020) revealed that the use of manipulatives and cooperative learning strategies helped students to work in groups which enhanced mathematical skills such as problem solving and developed a positive attitude towards learning. It also helped in improving student performances and developed critical and analytical thinking skills. The interviews with the students indicated a positive attitude towards learning mathematics as they stated that they enjoyed and were happy to learn mathematics using manipulatives and cooperative learning. It was also found that their critical and analytical thinking skills developed as they could reason out the problems during the teaching learning process. Additionally, the theory of constructivism supports that students can solve problem, interact and discover new knowledge through the use of manipulatives and cooperative learning. The students could solve the given questions more easily, and they performed better in the posttest.

Recommendations

Use of manipulatives and cooperative learning strategies are useful for enhancing students' learning achievement scores. Some of the recommendations that the researcher would like to make for future researchers include the following:

1. The study was carried out using only four manipulatives. Future researchers may consider making use of more manipulatives.
2. The study considered the concept of mathematical measurements to be taught using manipulatives and cooperative learning strategies. Future researchers may consider using the strategy with other topics as well to see the effectiveness of the strategy.

3. The study was carried out for the period of only one month. To see the reliability and effectiveness of the study, future researchers may consider carrying out the study for a longer period of time.

4. The study was carried out with primary school level students. Future researchers may consider looking at the possibility of conducting their study with students in a higher-grade level so as to see the effectiveness of the strategy with a wider range of students.

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