

Influence of Recreational Activities on Enhancing Learners' Creativity and Performance in Mathematics

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Abstract

This thesis entitled, "Influence of Recreational Activities on enhancing learners' creativity and performance in mathematics," aimed to determine the influence of recreational activities on enhancing learners' creativity and performance in mathematics. It followed the order of objectives enumerated as follows: to find out the level of recreational activities and learners' creativity; Assess the learners' level of performance; difference between the learners' performance in terms of pre-assessment and assessment; significant influence of recreational activities on enhancing learners' creativity and performance in Mathematics.

Descriptive method of the research was used to be able to observe a large mass of target population and make required conclusions about the variables. The primary respondents were the selected one hundred forty (140) Grade 7 – learners of Don Manuel Rivera Memorial National High School, Pila, Laguna, S.Y. 2023-2024.

The level of recreational activities was remarked as extremely effective, while level of learners' creativity was very high. The learners' level of performance during pre-assessment perceived a verbal interpretation of fairly satisfactory, while the level of learners' performance during post-assessment was marked as very satisfactory. Moreover, the result revealed that there is a difference between the learners' performance in terms of pre-assessment and post-assessment. Furthermore, this study found out that recreational activities have influence on enhancing learners' creativity and performance in mathematics.

Based on the findings above, the following conclusions were hereby drawn. There a significant difference between the learners' performance in terms of pre-assessment and assessment. Recreational activities have a significant influence on enhancing learners' creativity and performance in mathematics. Therefore, both hypotheses stated were rejected. This indicates that recreational activities have positively influenced students' comprehension and mastery of mathematical concepts. These activities which encompass interactive and collaborative games and simulations provide an engaging and dynamic learning environment.

In the formulated conclusions from the findings, it was recommended that Mathematics teachers may integrate and utilize recreational activities so that they can create a learning environment that is more interactive, immersive, collaborative, participative and integrative. Also, learners may enjoy and be eager to participate in different recreational activities to deeply understand mathematics concept and effectively enhance mathematical skills into a fun and convenient way. Moreover, future researchers may conduct studies regarding the utilization of recreational activities to further develop and create more engaging and effective activities that would enhance and nurture learners' creativity and performance in mathematics.

Keywords: Influence; Recreational Activities; performance in mathematics;

1. Introduction

Mathematics is a critical subject taught in elementary and secondary education that provides learners with fundamental knowledge and skills to organize their lives (Ariyanti & Santoso, 2020). Unfortunately, the COVID-19 pandemic has intensified the current education crisis and widened the learning gap in mathematics among young learners (Sooknanan & Seemungal, 2023).

The situation has led to a decline in math learning, as learners may need more remediation to progress to new lessons, leading to learning gaps (Torres, 2021). In support to the MATATAG Basic Education Agenda and as a sub-program under the National Learning Recovery Program (NLRP) aimed at addressing learning loss, the Department of Education (DepEd) roll out the National Learning Camp (NLC) during the 2022-2023 End-of-School Year (EOSY) break.

The NLC is a voluntary program that will start its phased implementation with Grades 7 and 8 focusing on English, Science, and Mathematics. It aims to create a camp-like atmosphere by integrating fun and engaging activities to foster learner interests, socio-emotional skills, personal growth, and character development.

Recreational activities can help in effective mathematics learning. It plays a vital role in making the subject an interesting one. Mathematical fun and games provide an excellent environment to explore ideas of mathematical skills in terms of analysis, problem solving and even logical reasoning. Games and activities also help the learners understand a particular lesson through self-directed exploration, develop the ability to think and solve complex problems.

Recreational activities can also be a tool on improving learners' mathematical skills in terms of analysis, problem solving and logical reasoning. This study aims to determine the effectiveness of integrating recreational activities in mathematics on improving learners' mathematical skills.

1.1 Statement of the Problem

Specifically, it aims to answer the following questions:

1. What is the level of recreational activities in terms of:
 - 1.1 Interactive;
 - 1.2 Immersive;
 - 1.3 Collaborative;
 - 1.4 Participative; and
 - 1.5 Integrative?
2. What is the level of learners' creativity in terms of:
 - 2.1 Divergent thinking;
 - 2.2 Originality;
 - 2.3 Inquisitiveness;
 - 2.4 Adaptability; and
 - 2.5 Interdisciplinary thinking?
3. What is the level of learners' performance in terms of:
 - 3.1 Pre-assessment; and
 - 3.2 Post-assessment?
4. Is there a significant difference between the learners' performance in terms of pre-assessment and post-assessment?
5. Do recreational activities have a significant influence on enhancing learners' creativity and performance in mathematics?

2. Methodology

The research design used in this study was descriptive method to determine the influence of recreational activities on enhancing learners' creativity and performance in Mathematics.

This design seems to be the most appropriate since the study wanted to determine if recreational activities have significant influence on enhancing learners' creativity and performance in Mathematics.

3. Results and Discussion

This chapter enumerates and discusses the results that were yielded from the treatment of the gathered data in this study. The following tabular presentations and discussions further characterize the significant influence of recreational activities on enhancing learners' creativity and performance in mathematics.

Level of Recreational Activities

In this study, the effectiveness of recreational activities in teaching mathematics is measured through five key dimensions: interactivity, immersiveness, collaboration, participation, and integration. These dimensions are crucial in understanding how such activities can enhance the educational experience by making learning more engaging and effective. By assessing these aspects, we can determine how well recreational activities support mathematical learning and identify areas for improvement.

Interactivity is a fundamental component in educational settings, especially in the context of teaching mathematics. Interactive activities require students to actively engage with the content, their peers, and instructors, fostering a more dynamic and participative learning environment. Interactivity in this context refers to the ways in which students can manipulate mathematical concepts, participate in discussions, solve problems collaboratively, and receive immediate feedback on their actions.

Table 1 presents the level of recreational activities in terms of being interactive.

Table 1 *Level of Recreational Activities in terms of being Interactive*

Interactive (<i>engaging and interesting</i>)	MEAN	SD	REMARKS
<i>The activity encourages me to interact with my groupmates.</i>	4.84	0.42	Strongly Agree
<i>Active communication within our group was very evident during the activity.</i>	4.83	0.38	Strongly Agree
<i>The activity is full of discovery and fun while learning.</i>	4.86	0.34	Strongly Agree
<i>The activity is interesting and holds my attention.</i>	4.85	0.36	Strongly Agree
<i>The activity builds teamwork and strong connection in our group.</i>	4.81	0.43	Strongly Agree
Weighted Mean	4.84		
SD	0.39		
Verbal Interpretation	Extremely Effective		

The weighted mean value of 4.84 with a standard deviation of 0.39 revealed that the level of recreational activities in terms of being interactive was interpreted as *Extremely Effective* among the respondents.

From this result, it can be inferred that recreational activities had great impact to the learners which encourages them to interact with each other, builds teamwork and lead them to discover new learnings.

Table 2 presents the level of recreational activities in terms of being immersive.

Table 2 Level of Recreational Activities in terms of being Immersive

Immersive (complete involvement and understanding)	MEAN	SD	REMARKS
<i>Everything to do in the activity is clear.</i>	4.87	0.34	Strongly Agree
<i>I've experienced new environment of learning compare to a normal day.</i>	4.82	0.38	Strongly Agree
<i>I learned concepts easily through innovative game tools.</i>	4.81	0.47	Strongly Agree
<i>I was able to recall and explore ideas needed in the activity.</i>	4.76	0.54	Strongly Agree
<i>I was able to move through a variety of increasingly harder activity as I learn more math skills.</i>	4.79	0.50	Strongly Agree
Weighted Mean	4.81		
SD	0.45		
Verbal Interpretation	Extremely Effective		

The weighted mean value of 4.81 with a standard deviation of 0.45 revealed that the level of recreational activities in terms of being immersive was interpreted as *Extremely Effective* among the respondents.

It implies that recreational activities served as an innovative tool to help learners generate and explore ideas, moving through a variety of increasingly harder activity.

Table 3 presents the level of recreational activities in terms of being collaborative.

Table 3 Level of Recreational Activities in terms of being Collaborative

Collaborative (working together with others to achieve a common goal)	MEAN	SD	REMARKS
<i>I enjoy doing the activity with my groupmates.</i>	4.79	0.52	Strongly Agree
<i>The activity allows our group to have brainstorming to do the task.</i>	4.74	0.58	Strongly Agree
<i>The activity improves our group's technique to accomplish the task.</i>	4.76	0.56	Strongly Agree
<i>The activity facilitates the exchange of ideas and thoughts within our group.</i>	4.80	0.50	Strongly Agree
<i>The activity guide us to find innovative solutions and new ideas to solve problems.</i>	4.75	0.58	Strongly Agree
Weighted Mean	4.77		
SD	0.55		
Verbal Interpretation	Extremely Effective		

The weighted mean value of 4.77 with a standard deviation of 0.55 revealed that the level of recreational activities in terms of being collaborative was interpreted as *Extremely Effective* among the respondents.

From this result, it can be inferred recreational activities promote collaboration from which learners are working together, to have brainstorming to do the task and facilitates the exchange of ideas and thoughts to the learners.

Table 4 presents the level of recreational activities in terms of being participative.

Table 4 Level of Recreational Activities in terms of being Participative

Participative (involvement and participation of the team)	MEAN	SD	REMARKS
<i>The activity encouraged me to have an active part in decision-making.</i>	4.81	0.50	Strongly Agree
<i>The activity requires active participation within the members of the group.</i>	4.77	0.58	Strongly Agree
<i>Each member of the group has the opportunity to be part of the activity.</i>	4.86	0.35	Strongly Agree
<i>Cooperation within our group is very evident during activity.</i>	4.84	0.37	Strongly Agree
<i>Ideas within are group are recognized and valued during activity.</i>	4.72	0.59	Strongly Agree
Weighted Mean	4.80		
SD	0.48		
Verbal Interpretation	Extremely Effective		

The weighted mean value of 4.80 with a standard deviation of 0.48 revealed that the level of recreational activities in terms of being participative was interpreted as *Extremely Effective* among the respondents.

It implies that recreational activities developed active participation among learners inside the classroom. Each member of the group has given the opportunity to be part of the activity, ideas within are group are recognized and valued during activity.

Table 5 presents the level of recreational activities in terms of being integrative.

Table 5 Level of Recreational Activities in terms of being Integrative

Integrative (combining and coordinating diverse elements into a whole)	MEAN	SD	REMARKS
<i>I easily understand and relate math concepts through recreational activities.</i>	4.81	0.39	Strongly Agree
<i>Activity tasks are easily accomplished through the use of innovative tools</i>	4.73	0.59	Strongly Agree
<i>The activity makes me think critically and logically.</i>	4.71	0.59	Strongly Agree
<i>I was able to recall and explore ideas needed in the activity.</i>	4.80	0.40	Strongly Agree
<i>I was able to move through a variety of increasingly harder activity as I learn more math skills.</i>	4.79	0.41	Strongly Agree
Weighted Mean	4.77		
SD		0.48	
Verbal Interpretation	Extremely Effective		

The weighted mean value of 4.77 with a standard deviation of 0.48 revealed that the level of recreational activities in terms of being integrative was interpreted as *Extremely Effective* among the respondents.

From this result, it can be inferred that recreational activities helped the learners to easily understand and relate math concepts. They move through a variety of increasingly harder activity as they learn more math skills.

Level of Learners' Creativity

In this study Learners' creativity in learning mathematics measured in terms of divergent thinking, originality, inquisitiveness, adaptability and interdisciplinary thinking.

Table 6 presents the level of learners' creativity in terms of divergent thinking.

The weighted mean value of 4.77 with a standard deviation of 0.47 revealed that the level of learners' creativity in terms of divergent thinking was interpreted as very high among the respondents. ideas and collectively work towards one goal, boosting our team morale.

Table 6 Level of Learners' Creativity in terms of Divergent Thinking

Divergent Thinking (generate creative ideas by exploring many possible solutions)	MEAN	SD	REMARKS
Generate multiples and creative ideas to accomplish the task.	4.82	0.38	Strongly Agree
Think and apply multiple solutions to task.	4.74	0.58	Strongly Agree
Use inductive reasoning (generalized conclusions).	4.73	0.59	Strongly Agree
Take more time for a free-flowing and spontaneous yet brilliant ideas.	4.81	0.39	Strongly Agree
Compare ideas and collectively work towards one goal, boosting our team morale.	4.75	0.43	Strongly Agree
Weighted Mean	4.77		
SD	0.47		
Verbal Interpretation	very high		

In table 7, it shows that the weighted mean value of 4.79 with a standard deviation of 0.48 revealed that the level of learners' creativity in terms of originality was interpreted as *very high* among the respondents.

It can be inferred that through recreational activities, learners were able to generate their own creative ideas, make connections to their previous knowledge and learned additional ways on how to think independently in a logical manner.

Table 7 presents the level of learners' creativity in terms of originality.

Table 7 Level of Learners' Creativity in terms of Originality

Originality (ability to think independently, unique and creatively)	MEAN	SD	REMARKS
Generate my own creative ideas.	4.79	0.52	Strongly Agree

<i>Make connections to my previous knowledge.</i>	4.76	0.58	Strongly Agree
<i>Fit uniquely appropriate ideas.</i>	4.86	0.35	Strongly Agree
<i>Learned additional ways on how to think independently in a logical manner.</i>	4.84	0.37	Strongly Agree
<i>Apply my own perspective on how to creatively accomplish the task.</i>	4.71	0.59	Strongly Agree
Weighted Mean	4.79		
SD		0.48	
Verbal Interpretation		very high	

Table 8 presents the level of learners' creativity in terms of inquisitiveness.

The weighted mean value of 4.74 with a standard deviation of 0.57 revealed that the level of learners' creativity in terms of inquisitiveness was interpreted as *very high* among the respondents.

Table 8 Level of Learners' Creativity in terms of Inquisitiveness

Inquisitiveness (intellectual curiosity and eagerness for knowledge)	MEAN	SD	REMARKS
<i>Explore new information and ideas.</i>	4.74	0.53	Strongly Agree
<i>Raise questions I'm curious about.</i>	4.64	0.68	Strongly Agree
<i>Seek and discover new techniques in solving problems.</i>	4.78	0.55	Strongly Agree
<i>Dive deep into interesting Math concepts.</i>	4.81	0.49	Strongly Agree
<i>Be eager and have a strong desire to accomplish the task.</i>	4.75	0.58	Strongly Agree
Weighted Mean	4.74		
SD		0.57	
Verbal Interpretation		very high	

It implies that through recreational activities, learners were able to explore new information and ideas, seek and discover new techniques in solving problems and dive deep into interesting Math concepts.

Table 9 presents the level of learners' creativity in terms of adaptability.

The weighted mean value of 4.74 with a standard deviation of 0.56 revealed that the level of learners' creativity in terms of adaptability was interpreted as *very high*

Table 9 Level of Learners' Creativity in terms of Adaptability

Adaptability (ability to adjust to changes in their environment)	MEAN	SD	REMARKS
<i>Adapt new learning strategies.</i>	4.71	0.61	Strongly Agree
<i>Be more flexible in order to accomplish the activity task.</i>	4.73	0.59	Strongly Agree

<i>Develop my self-regulated learning.</i>	4.87	0.34	Strongly Agree
<i>Be more responsible as member of our group.</i>	4.69	0.66	Strongly Agree
<i>Willing to accept new roles and accountabilities.</i>	4.71	0.60	Strongly Agree

Weighted Mean**4.74****SD****0.56****Verbal Interpretation****very high**

It implies that through recreational activities, learners were able to adapt new learning strategies, be more flexible, develop self-regulated learning and willing to accept new roles and accountabilities.

Table 10 presents the level of learners' creativity in terms of interdisciplinary thinking. The weighted mean value of 4.75 with a standard deviation of 0.49 revealed that the level of learners' creativity in terms of interdisciplinary thinking was interpreted as *very high* among the respondents.

It implies that through recreational activities, learners were able to find solutions based on a new understanding of complex situations, appreciate and recognize their own skills and capabilities.

Table 10 Level of Learners' Creativity in terms of Interdisciplinary thinking

Interdisciplinary Thinking (capacity to understand multiple viewpoints including an appreciation of the differences between ideas and disciplines)	MEAN	SD	REMARKS
<i>Realize the importance of analyzing and redefining Math problems/tasks deeply.</i>	4.76	0.47	Strongly Agree
<i>Appreciate and recognize my own skills and capabilities.</i>	4.74	0.44	Strongly Agree
<i>Find solutions based on a new understanding of complex situations.</i>	4.66	0.48	Strongly Agree
<i>Integrate my ideas to my groupmates' ideas.</i>	4.64	0.60	Strongly Agree
<i>Acquire and develop skills such as collaboration, critical analysis and problem-solving.</i>	4.73	0.48	Strongly Agree
Weighted Mean	4.75		
SD		0.49	
Verbal Interpretation		very high	

Level of Learners' Performance

In this study learners' performance in mathematics measured in terms of pre-assessment and post-assessment.

Table 11 presents the level of learners' performance in terms of pre-assessment.

The weighted mean of 8.14 revealed that the level of learners' performance in terms of pre-assessment was interpreted as *Fairly Satisfactory*. It implies that learners are really struggling in mathematics and need focus in boosting their interest and developing skills and creativity.

Table 11 Level of Learners' Performance in terms of Pre-assessment

Score	Frequency	Percentage	Descriptive Value
25-30	0	0%	Outstanding
19-24	0	0%	Very Satisfactory
13-18	5	4%	Satisfactory
7-12	91	65%	Fairly Satisfactory
0-6	44	31%	Did Not Meet Expectation
Mean	8.14	Interpretation	Fairly Satisfactory

Table 12 presents the level of learners' performance in terms of post-assessment.

The weighted mean of 22.96 revealed that the level of learners' performance in terms of post-assessment was interpreted as *Very Satisfactory*. It implies that recreational activities really help the learners to improve their performance in mathematics through an engaging and full of learning environment.

Table 12 *Level of Learners' Performance in terms of Post-assessment*

Score	Frequency	Percentage	Descriptive Value
25-30	49	35%	Outstanding
19-24	82	59%	Very Satisfactory
13-18	9	6%	Satisfactory
7-12	0	0%	Fairly Satisfactory
0-6	0	0%	Did Not Meet Expectation
Mean	22.96	Interpretation	Very Satisfactory

Strict guidelines must be followed to protect participants, trainers, and practice from negative outcomes. SBSA acceptability and success require methodical, evidence-based, and progressive approaches.

Difference between the Learners' Performance in terms of Pre-assessment and Post-assessment

Table 13 presents the difference between the learners' performance in terms of pre-assessment and post-assessment.

The table revealed that the computed t-value of -45.39 is beyond the critical t-value of 1.98, regardless of the sign. Therefore, it can be concluded that there is a significant difference between the learners' performance in terms of pre-assessment and post-assessment.

Table 13 *Difference between the Learners' Performance in terms of Pre-assessment and Post-assessment*

Learners' Performance	Critical t-value	Computed t-value	Remarks
Pre-assessment	1.98	-45.39	<i>Significant</i>
Post-assessment			

From this result, it can be inferred that through recreational activities, learners' performance can be improved and enhance. Learners were able to fully understand the math concept and deeply analyzed the given situations in mathematics.

Significant Influence of Recreational Activities on Enhancing Learners' Creativity and Performance in Mathematics

Table 14 presents the significant influence of recreational activities on enhancing learners' creativity and performance in mathematics.

Recreational activities in teaching mathematics appeared to have a significant influence on enhancing learners' creativity and performance in mathematics. This is in accordance with the computed p-values obtained from the tests which are less than the significance alpha of 0.05.

Table 14 *Significant Influence of Recreational Activities on Enhancing Learners' Creativity and Performance in Mathematics*

		f-value	p-value	Analysis
Recreational Activities	Learners' Creativity	2.86	0.004	Significant
	Performance (Post-assessment)	3.81	0.019	Significant

4. Conclusion and Recommendations

Based on the findings above, the following conclusions were hereby drawn:

A notable difference exists between the learners' performance in the pre-assessment and assessment. Therefore, the null hypothesis is rejected. This indicates that educational interventions, particularly the incorporation of recreational activities, have positively influenced students' comprehension and mastery of mathematical concepts.

Recreational activities have a significant influence on enhancing learners' creativity and performance in mathematics. Thus, the null hypothesis is rejected. These activities, which encompass interactive and collaborative games and simulations provide an engaging and dynamic learning environment.

In the formulated conclusions from the findings, it was recommended that:

1. Mathematics teachers may integrate and utilize recreational activities so that they can create a learning environment that is more interactive, immersive, collaborative, participative and integrative.
2. Learners may enjoy and be eager to participate in different recreational activities to deeply understand mathematics concept and effectively enhance mathematical skills into a fun and convenient way.
3. Future researchers may conduct studies regarding the utilization of recreational activities to further develop and create more engaging and effective activities that would enhance and nurture learners' creativity and performance in mathematics.

Reference:

- Ariyanti & Santoso (2020). Mathematics as a critical subject taught in elementary and secondary education.
- Sooknanan & Seemungal (2023). Learning gap in mathematics among young learners.
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