*Asian Journal of Multidisciplinary Studies*
*Vol. 4, No. 2, (2021)*
**ISSN 2651-6691 (Print)**
**ISSN 2651-6705 (Online)**

# Games and Puzzles as Teaching Strategies in Mathematics

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**Abstract -** *This study assessed the games and puzzles as teaching strategies in Mathematics in the Secondary Public Schools in Bauang District, Division of La Union during the School Year 2016 – 2017 as bases of proposed intervention measures. The study had eleven (11) Mathematics teachers and one hundred (100) Grade 7 learners as respondents. This study was a descriptive research design and used a documentary analysis. The primary objectives of this paper were 1) described the games and puzzles as teaching strategies in Mathematics in Secondary Public Schools, 2) described the level of attainment of the objectives of games and puzzles as teaching strategies in Mathematics, 3) described the level of effectiveness of games and puzzles as teaching strategies in Mathematics, 4) the extent of the effects of games and puzzles as strategies in teaching Mathematics, 5) described the degree of seriousness of the problems encountered in using games and puzzles as teaching strategies in Mathematics, and 6) the level of implementability of the strategies to address the problems encountered in using games and puzzles as strategies in teaching Mathematics. Findings revealed that 1) the objectives of games and puzzles as teaching strategies in Mathematics were perceived as "highly attained," 2) the games and puzzles as teaching strategies in Mathematics were perceived to be "moderately effective," 3) there was a "great extent" of the effects of games and puzzles as strategies in teaching Mathematics, 4) the problems encountered in using games and puzzles as teaching strategies in Mathematics were perceived to be "moderately serious," and 5) the strategies to address the problems encountered in using games and puzzles as strategies in teaching Mathematics were perceived to be "highly implementable." Based on the findings of the study, it proposed intervention measures to improve the teaching of Mathematics using games and puzzles in the Secondary Public Schools.*

***Keywords*** – Games, Puzzles, Implementability, Intervention Measures, Teaching Strategies

## INTRODUCTION

Education is the most important and most noble of human endeavors. All other activities have their foundation in education, and they are enhanced as time goes by. Education enables humans to achieve their fullest personal, spiritual, mental, social, and physical potentials. The ability to be educated is what distinguishes humans from animals.

Education transforms an individual and allows him to effect change in his environment. Since every learner expected to behave according to the school's pre-defined Code of Conduct, it is in this way that education imparts discipline in a person. Through education, a child starts to acquire the basic knowledge necessary for more complex learning. Learning becomes interesting if lessons are taught through games and stories. Further, education builds the character, moral values, and personality of a man. A person of good character and high moral values always respects and takes care of others.

One of the core subjects of education is Mathematics. It is a creation of the human mind concerned chiefly with ideas, processes, and reasoning. It is an important subject in understanding lessons in Arithmetic, Algebra, Geometry, Trigonometry, Statistics, and Calculus.

Mathematics is a way of thinking, a form of organizing a logical proof. As a way of reasoning, it gives an insight into the power of the human mind. Mathematics is the cradle of all creations, without which the world cannot move an inch.

Mathematics is essential for every learner because it is the "bedrock" of other subjects. Another thing to note is that adequate knowledge in Mathematics boosts the reasoning faculty of learners. Knowledge of Mathematics

helps learners to understand their environments better through analysis of the existing facts. www.preservearticles.com

However, some learners failed their Mathematics subjects despite thorough instruction. The contributors to the failures are poor motivational techniques, lack of skills and resourcefulness, inability to make the subject practical and simple, and poor knowledge of the course attributable to the teachers.

On the other hand, learners also contribute to Mathematics's massive failures due to dislike of the subject and the teacher, lazy attitude in studying, and lack of discipline. The parents also take part wherein they do not support their children in their activities in Mathematics.

One way of addressing the noted failures is by introducing different techniques to make studying Mathematics more interesting. It includes using visuals, making connections, using Formative Assessments, and teaching strategic thinking. Other teachers incorporate the strategies of games and solving puzzles as tools in teaching Mathematics. www.gameseduc.press

Experience says learning Mathematics can be made easier and enjoyable if the curriculum includes Mathematical activities and games. Mathematics puzzles and riddles encourage and attract an alert and open-minded attitude among youngsters and help them develop clarity in their thinking. Emphasis should develop a clear concept in Mathematics in a child, right from the primary classes.

Davies (2009) used games and puzzles in Mathematical programs to develop a positive attitude among the learners since both provide opportunities for building self-concept and developing positive attitudes towards Mathematics by reducing the fear of failure and error. Mathematics teachers also observed this in the Secondary Public Schools of Bauang District, Division of La Union.

Compared to more formal activities, there is more significant learning in games and puzzles due to the increased interaction between children, opportunities to test intuitive ideas, and problem-solving strategies. Further, games allow learners to operate at different levels of thinking and to learn from each other. Learner's thinking often becomes apparent through the actions and decisions they make during the game.

The use of games and puzzles helps in fast strategic thinking and problem-solving since learners have to utilize logic to think three (3) steps to solve problems and complete levels. Also, many games contain certain aspects that help children with specific skills to solve Mathematical problems.

Considering the existing facts, the researcher assessed the games and puzzles as teaching strategies in Mathematics in the Secondary Public Schools in Bauang District, Division of La Union during the School Year 2016 – 2017 as bases of proposed intervention measures.

Hence, this study conceptualized.

**OBJECTIVES OF THE STUDY**

This study assessed the effectiveness of games and puzzles as teaching strategies in Mathematics in the Secondary Public Schools in Bauang District, Division of La Union during the School Year 2016 – 2017 as bases of proposed intervention measures.

Specifically, it sought answers to the following questions: 1) What is the level of attainment of the objectives of games and puzzles as teaching strategies in Mathematics as perceived by Mathematics teachers and the Grade 7 learners? 2) What is the level of effectiveness of games and puzzles as teaching strategies in Mathematics as perceived by Mathematics teachers and the Grade 7 learners? 3) What is the extent of the effect of games and puzzles as teaching strategies in Mathematics as perceived by Mathematics teachers and the Grade 7 learners? 4) What is the degree of seriousness of the problems encountered in using games and puzzles as teaching strategies in Mathematics as perceived by Mathematics teachers and the Grade 7 learners? 5) What is the level of implementability of the strategies to address the problems encountered in using games and puzzles as teaching strategies in Mathematics as perceived by Mathematics

teachers and the Grade 7 learners? 6) Based on the findings of the study, what intervention measures can be proposed to improve the teaching of Mathematics using games and puzzles in the Secondary Public Schools in Bauang District, Division of La Union?

## MATERIALS AND METHODS

This study was conducted in the Secondary Public Schools in Bauang, District, Division of La Union during the School Year 2016 – 2017.

The study used descriptive research design and documentary analysis. Descriptive research describes the nature of a situation as it exists at the time of the study and explores the causes of a particular phenomenon.

teaching strategies in Mathematics. Part III gathered the extent of the effect of games and puzzles as teaching strategies in Mathematics. Part IV dealt with the degree of seriousness of the problems encountered in using games and puzzles as teaching strategies in Mathematics. Part V delved into the level of implementability of the strategies to address the problems encountered in using games and puzzles as teaching strategies in Mathematics.

The research instrument was piloted to five (5) Mathematics teachers and ten (10) Grade 7 learners in the Secondary Public Schools of Naguilian District. The pilot test aimed to establish the research instrumentation's validity as to content, format, and language. The computed Spearman rho (0.92) used to determine the reliability of the instrument used and found to be "Highly Reliable."

Following ethical considerations, the questionnaire for Mathematics teachers conducted during the Teacher's Meeting held on February 17, 2017, while the questionnaire for Grade 7 learners administered with The School Heads and Teachers' supervision.

The retrieval of the questionnaire was done on the same day.

The statistical tools used were frequency counts, percentages, weighted means, and ranking in the presentation and interpretation of data. The descriptive ratings (DR) used the

The study involved eleven (11) Mathematics teachers and one hundred (100) Grade 7 learners as respondents through the purposive sampling technique.

The researcher used a constructed questionnaire as the main data gathering tool for this study. There was a common questionnaire for the Mathematics teachers and Grade 7 learners.

The research instrument comprised five (5) parts. It was adopted from the study of researcher Milan (2011), from collated reading books, and Instructional Materials (IMs).

Part I elicited the level of attainment of the objectives of games and puzzles as teaching strategies in Mathematics. Part II focused on the level of effectiveness of games and puzzles as Likert scale, where 1 as the lowest and 5 as the highest.

For the Level of Attainment, the descriptive rating (DR) was 1 as Not Attained (NA) and 5 as Very Highly Attained (VHA).

For the Level of Effectiveness, the descriptive rating (DR) was 1 as Not Effective (NE) and 5 as Very Highly Effective (VHE).

For the Extent of the Effects, the descriptive rating (DR) was 1 as Not at All (NA) and 5 as Very Great Extent (VGE).

For the Degree of Seriousness, the descriptive rating (DR) was 1 as Not Serious (NS) and 5 as Very Highly Serious (VHS).

For the Level of Implementability, the descriptive rating (DR) was 1 as Not Implementable (NI) and 5 as Very Highly Implementable (VHI).

## RESULTS AND DISCUSSION

The significant findings of the study were the following.

The table showed a summary of the Mathematics teachers and Grade 7 learners' perceptions on the different variables used.

Table 1. The Summary Perceptions of Mathematics Teachers and Grade 7

| Variables | AWM | Descriptive Rating |
|---|---|---|
| Level of Attainment | | |
| -Teachers | 3.64 | Highly Attained |
| -Learners | 3.61 | Highly Attained |
| Level of Effectiveness | | |
| -Teachers | 3.28 | Moderately Effective |
| -Learners | 3.19 | Moderately Effective |
| Level of the extent of Effects | | |
| -Teachers | 3.67 | Great Extent |
| -Learners | 3.60 | Great Extent |
| Degree of Seriousness | | |
| -Teachers | 3.27 | Moderately Serious |
| -Learners | 3.26 | Moderately Serious |
| Level of Implementability | | |
| -Teachers | 3.72 | Highly Implementable |
| -Learners | 3.66 | Highly Implementable |

Based on the summary, data revealed the perceptions of the Mathematics teachers and Grade 7 learners on the study variables, such as the Level of Attainment, the Level of Effectiveness, the Level of the Extent of Effects, the Degree of Seriousness, and the Level of Implementability.

The Level of Attainment (3.64, 3.61) for games and puzzles for teachers and learners had descriptive ratings of Highly Attained (HA). The Level of Effectiveness (3.28, 3.19) of games and puzzles for teachers and learners had descriptive ratings of Moderately Effective (ME). The Level of the Extent of Effects (3.67, 3.60) of games and puzzles for teachers and learners had descriptive ratings of Great Extent (GE). The Degree of Seriousness (3.27, 3.26) of games and puzzles for teachers and learners had descriptive ratings of Moderately Serious (MS). The Level of Implementability (3.72, 3.66) of games and puzzles for teachers and learners had descriptive ratings of Highly Implementable (HI).

Data showed that there were an agreement in the perceptions of the teachers and learners. It implied that there were consistency and unity in their observations. Mathematics teachers and Grade 7 learners agreed that the objectives both in games and puzzles were Highly Attained (HA), that the games and puzzles were Moderately Effective (ME), that the games and puzzles had Great Extent (GE) of effects to the instruction, that the problems encountered were Moderately Serious (MS), and the strategies to address the Mathematics problems were Highly Implementable (HI).

## CONCLUSION AND RECOMMENDATION

Based on the salient findings of this study, these were the conclusions drawn.

The objectives of games and puzzles as teaching strategies in Mathematics realized and carried out in the Secondary Public Schools in Bauang District.

There are games and puzzles used in teaching Mathematics that are very effective and not so effective.

Games and puzzles as teaching strategies in Mathematics make learning enjoyable and interesting.

The problems encountered in using games and puzzles as teaching strategies in Mathematics are not grave and serious.

The strategies to address the problems encountered in using games and puzzles as teaching Mathematics strategies are suitable and doable.

In light of the provided conclusions, this study humbly recommended the following.

The proposed intervention measures may improve the teaching of Mathematics using games and puzzles in the Secondary Public Schools in Bauang District, Division of La Union.

Teachers and School Administrators may sustain the implementation of games and puzzles as teaching strategies in Mathematics.

Enhancement activities may conduct on the use of games and puzzles as teaching strategies in Mathematics.

Highly Serious (HS) problems encountered in using games and puzzles as teaching strategies in Mathematics may be given priority attention by Mathematics teachers and School Administrators.

Highly Implementable (HI) strategies to address the problems encountered in using

games and puzzles as strategies in Mathematics may be adopted.

A similar study is encouraged but applied in another setting to validate existing claims and arguments.

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