EFFECTIVENESS OF INTEGRATING RIDDLES IN TEACHING MATHEMATICS AMONG VIII STANDARD STUDENTS

By

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ABSTRACT

Mathematics is considered as dry subject and students do not find anything interesting in it. This impression about Mathematics can be reversed with the help of recreational activities in Mathematics. The present study tries to find out the effectiveness of integrating riddles in teaching mathematics among eighth standard students. Two equivalent group experimental-designs are employed for this study. The investigator has chosen 40 eighth standard students for the study. According to the scoring of pre-test, 20 students were chosen as control group and 20 students were chosen as experimental group. Finally the results show that there is a significant difference between the means of students thought through conventional method and puzzles and riddles way of learning group. There is a significant difference between the means of the Post-Test scores of control group and experimental group students with respect to the knowledge, understanding and application objectives.

Keywords: Riddles, Mathematics, Effectiveness, VIII Standard Students.

INTRODUCTION

At present majority of mathematics teachers follow the traditional methods of instruction in schools. What is required is learner centered-approach to enable them to work on their own with little from the support from the teachers. When teachers carry out instructional process in the classroom, learner tends to be more passive listeners. No lesson can be effective unless there is effective pupil participation in it. In order to enable the learners to participate in the instructional process, there is an imperative need to adopt some kind of learner- centered new approaches in the classroom (Sudhir Kumar. 2000). The teacher should always try to keep the interest of child in mind. Correlating the subject matter with the problem of life can awaken interest. Teaching should be child centered. New knowledge and experiences should be linked with the previous knowledge to arouse interest of the people. So the investigator attempts investigate "Effectiveness of integrating Riddles in teaching Mathematics among VIII standard students in Dindigul district."

Operational Definition of the Key Terms

Effectiveness

Effectiveness refers to the adequacy of accomplish a purpose as well as producing the intended or expected results. This study measures the effectiveness in terms of the achievement scores of the students if the riddles way of instruction is used in Mathematics in learning. The effectiveness of riddles integrated in teaching mathematics has been studied through an experimental method.

Riddles Approach in Teaching

A riddle is a statement or question having a double or veiled meaning, put forth as a puzzle to be solved. Riddles way of instructional programme, which utilizes the attributes to create a meaningful mathematical learning environment where learning is fostered and supported. It is a method of teaching mathematics when the riddles are used along with the produce of teaching.

Mathematics

Mathematics is a collection of symbols, notations and numbers. (Anice James, 2005)

Eighth Standard Students

The students those who are studying eight standard in school.

Objectives of the Study

- To find out the difference between the post test mean

scores of students thought through conventional method and integrating riddles way of learning group.

- To find out the difference between the means of the Post-Test scores of control group and experimental group students with respect to the knowledge, understanding and application objectives.
- To find out the difference between the means of the Pre-Test and Post-Test scores of experimental group students with respect to the knowledge, understanding and application objectives.

Hypotheses of the Study

- There is no significant difference between the means of students thought through conventional method and integrating riddles way of learning group.
- There is no significant difference between the means of the Post-Test scores of control group and experimental group students with respect to the knowledge, understanding and application objectives.
- There is no significant difference between the means of the Pre-Test and Post-Test scores of experimental group students with respect to the knowledge understanding and application objectives.

Methodology

Two equivalent group experimental-designs are employed for this study.

Selection of the Sample

The sample of the study consisted of 40 students of 8th standard in R.C. High School, Silukuvarpatti, Dindigul district. According to the scoring of intelligent test, 20 students from eighth standard students were chosen as control group and another 20 students were chosen as experimental group.

Tools Used for the Study

The following are the tools used for the present study

- Riddles of the selected content
- Performa of the samples and
- Achievement test in mathematics

Reliability and Validity

For establishing the reliability of the developed tool, test-retest technique was followed and correlation co-efficient was calculated and the value is 0.82. The correlation value indicates that the tool is reliable. For establishing the content-validity of the tool, the investigator consulted the experts. Additions and deletions were made as per their suggestions. Thus it was established that the test contained 25 items for evaluating the learning outcomes in Mathematics.

Treatment of the Groups

The investigator had selected 2 units from the VII standard mathematics syllabus. The units were Algebra and trigonometry. The investigator taught these units to the Control Group by traditional method. After the completion of the teaching session, the investigator tested the Mathematics Knowledge using the same pre-test question paper and the scores of Control Group were noted. Special care was taken by the investigator in keeping away the Control Group from the Experimental Group to eliminate the impact of the integrating riddles in teaching mathematics among the Control Group students.

The Experimental Group was also exposed to the teaching session on the same units of the Mathematics, but through the technique of integrating riddles in teaching mathematics rather than traditional method. At the end of the teaching sessions, the Experimental Group was also administered the same achievement test and the scores were noted. This treatment was given to these two groups for 20 days, totally 20 hours for both experimental and control group.

The investigator has used some of the following riddles for integrating his teaching in mathematics. (i) Two brothers who always walk in the same direction? Answer: a person's legs (Durai kannu, A. 1995). This riddles is the example for equation. (ie) Equation has two equal parts. (ii) A bird built a house but the house has no doors and it has no windows ? Answer: An egg (Dary Francis and David Pritchard. 2002). This riddle explores the structure of open bracket. (iii) Two lions waiting on a hill? Answer: The two ears (Dharmaraj Joseph. 2004). This riddle gives the idea of square in the variable (ie) a2. etc.,

Statistical Techniques Used

Statistical techniques helps to classify, organize, summarize, the numerical facts and draw conclusions (Aggarwal, Y.P,1990). Descriptional, Differential and Inferential Statistics were used for the present study. This includes Mean, Standard Deviation and 't' test.

Data Analysis

Null Hypothesis 1

There is no significant difference between the post test mean scores of students thought through conventional method and integrating riddles way of learning group.

It is inferred from the above Table 1 that calculated 't' value is higher than the table value at 5% level of significance. Therefore the null hypothesis is rejected. The students perform well in the post test when they taught through integrating riddles in mathematics teaching.

Null Hypothesis 2

There is no significant difference between the means of the Post-Test scores of control group and experimental group students with respect to the knowledge, understanding and application objectives.

It is inferred from the above Table 2 that there is significant difference between control and experimental group students in their post test scores for attainment of knowledge, understanding and application objectives.

Null Hypothesis 3

There is no significant difference between the means of the Pre-Test and Post-Test scores of experimental group students with respect to the knowledge, understanding and application objectives.

It is inferred from the above Table 3 that there is a significant difference between the means of the Pre-Test and Post-Test scores of experimental group students with respect to the knowledge, understanding and application objectives.

Interpretation & Discussion

The 't' test result reveals that the experimental group students are better than the control group students in the post-test scores. This may be due to the fact that the Puzzles and Riddles integrated method has influenced the experimental group students in learning. Using Riddles in teaching helps the students to develop their skill of divergent thinking for attaining the solution. Moreover, this method increases their interest and attitude towards learning Mathematics.

The 't' test result shows that the experimental group students are better than the control group students in their post test scores for attainment of knowledge, understanding and application objectives. This may be due to the fact that the Riddles way of teaching method has developed the readiness of the students to acquire the knowledge of Mathematics. Also it motivated the students to understanding the concepts easily (Sudhir Kumar. 2000). Since this method gave pleasurable values in learning Mathematics Riddles approach method inculcated the skill of intuition in problem solving. So the experimental group is better than the control group in attainment of knowledge, understanding and application objectives.

The outcome of the study is a clearly pointing out to the fact that integrating riddles is more effective in learning

Groups	No. of Students	Mean	SD	't' Value	Table Value	Result
Control Group	20	65.45	10.63	5.052	2.02	Significant
Experimental Group	20	83. 80	12.27			

Table 1. Difference between Control and Experimental Group Students in the Post Test

Objectives	Group	Mean	SD	't' Value	Table Value	Result
Knowledge	Control	19.05	5.72	3.154	2.02	Sig
	Experimental	23.80	3.54			
Understanding	Control	20.60	4.90	2.993	2.02	Sig
	Experimental	25.40	5.23			
Application	Control	25.80	5.72	4.750	2.02	Sig
	Experimental	34.60	5.98			

Table 2. Difference between Control and Experimental Group Students in their Post Test Scores for Attaining the Objectives

Objectives	Test	Mean	SD	't' Value	Table Value	Result
Knowledge	Pre test	12.40	5.64	7.64	1.96	Significant
	Post test	23.80	3.54			
Understanding	Pre test	14.60	6.26	5.91	1.96	Significant
	Post test	25.40	5.23			
Application	Pre test	15.20	7.06	9.37	1.96	Significant
	Post test	34.60	5.98			

Table 3. Difference between Pre-Test and Post-Test scores of the Experimental Group Students for Attaining the Objectives

Mathematics than the conventional teaching method. The present study reveals that the experimental group students who learn through integrating riddles learning achieved more in mathematics than control group students who learnt through conventional method. This is in congruence with the result of (Nalayini, 1991 & Xavier. 2005) who reported that the changes made in the design and presentation of the learning material resources improved the learning effectiveness of the joyful learning and teaching.

In general, riddles way of teaching Method is effective in learning Mathematics among VIII standard students. Since, this method inspired the exploration of mathematical ideas, nurtured and used various strategies, properties and relationships in learning Mathematics (Thiyagu, 2006). So the Riddles way of teaching Method is very useful in teaching and learning Mathematics to the high school students.

Recommendations of the Study

On the basis of the findings, the following recommendations are offered

Recommendations for Educational Administration

- Puzzles and Riddles can be used in teaching Mathematics.
- The teachers of Mathematics can be encouraged to integrating Puzzles and Riddles in teaching Mathematics.
- The teachers of Mathematics can be trained to use the Puzzles and Riddles in various new Mathematical concepts.
- The teachers can be asked the students to construct new puzzles and Riddles.
- The Mathematics teacher can inculcate the recreational activities in a classroom.
- The Mathematics teacher can motive the students by using Puzzles and Riddles.

Recommendations for Further Researchers

- It is hoped that the present study can be extended for further research and few titles are given below.
- Effectiveness of Puzzles and Riddles approach teaching method in teaching Mathematics to the college students.
- Development of Puzzles and Riddles with the help of computer packages could be studied.
- Effectiveness of integrating Puzzles and Riddles in teaching for the slow learners in Mathematics.
- Effectiveness of integrating Puzzles and Riddles in teaching for the high achievers in Mathematics.

Recreational activities bring variety and also develop taste for mathematics. Mathematics was mainly studied for its recreational value and as a leisure time activity. People enjoyed playing with numbers and other mathematical problems. Riddles in Mathematics provided fun and were quite witty. So try to make learning in joyful.

Conclusion

This study clearly indicated that the integrating riddle in teaching by the investigator for teaching of mathematics for the state board schools in VIII standard was effective. The effectiveness was found in terms of Post-Test of the students of experimental group taught through integrating riddles. Recreational activities such as puzzles, riddles etc. make the subject lively and interesting active mathematics club is one of the sure signs of students' interest. This impression about Mathematics can be reversed with the help of recreational activities in Mathematics. It is also possible to present a lively and interesting picture of Mathematics with the help of these activities.

References

[1]. Aggarwal, Y. P. (1990). *Statistical methods: Concept application and computation,* New Delhi: Sterling publishers Pvt. Ltd.

[2]. Anice James. (2005). *Teaching of mathematics,* Neel Kamal Publications, Pvt. Ltd. New Delhi.

[3]. Dary Francis and David Pritchard. (2002). *Puzzles and Teasers for Everyone, Gaurao Publishing House,* New Delhi.

[4]. Dharmaraj Joseph. (2004). *Arivukoormaikku Virunthu* (Tamil), Narmadha Pathipagam, Chennai.

[5]. **Durai kannu, A. (1995).** *Vedikkai Kanakughal* (Tamil), Sandha Publishers, Chennai.

[6]. **Nalayini, S. (1991).** "Effectiveness of using number games to teach arithmetic at primary level", *Fifth Survey of Research in Education,* Vol. II, NCERT, New Delhi.

[7]. **Sudhir Kumar (2000).** *The Teaching of Mathematics, Anmol Publications Pvt. Ltd.,* New Delhi.

[8]. **Thiyagu, K. (2006).** "A study on the effectiveness of web-based instruction in learning mathematics education among teacher trainees", Unpublished M.Ed Dissertation, Bharathidasan University, Tiruchirappalli.

[9]. **Xavier, P. (2005).** "Effectiveness of Puzzles-Integrated methods in teaching Mathematics to the high school students", Unpublished M.Ed Dissertation, Manonmaniam Sundaranar University, Tirunelvelli.

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