

Achievement in Mathematics of Scheduled Caste in Relation to Creativity in Mathematics

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Abstract

Mathematics is an important subject in secondary schools because it is associated with more academic and career opportunities. The history of human civilization reveals the necessity of counting, measuring, weighing and drawing in all aspects of environment. Mathematics has not become important only today but it occupied and kept this important place from the earlier times and is perhaps the only subject which merits this destination. This paper highlights the relationship between achievement in mathematics and mathematical creativity of scheduled caste. Achievement in mathematics showed positive relationship with the mathematical creativity. There exists a strong relationship between the achievement in mathematics and mathematical creativity of urban and rural scheduled caste students.

KEYWORDS : Achievement in Mathematics , Creativity in Mathematics

Introduction

The main goal of mathematics education is the mathematization of the student's thinking. The literature indicates that achievement in mathematics is most often measured by speed and accuracy of student's computation with a little emphasis on problem solving and pattern finding and no opportunities for students to work on rich mathematical tasks that require mathematical creativity. Traditional math education focused mostly on convergent thinking in which a student memorized existing mathematical rules and theorems and then applied them to problems to find one exclusive solution rather than to apply these rules and theorems in new and different ways. Actually mathematics has a great scope for creativity. In fact the learning of mathematics is greatly facilitated when students are made to use their ingenuity to discover in many uses and properties. Students should be encouraged to give illustrations, formulate hypotheses, make guesses, construct logical arguments, relate different mathematical ideas and solve problems. Because of teachers tendency to accept only close ended answer limits the use of creativity in the classroom and reduces mathematics to a set of skills to master and also reduces enthusiasm for mathematics affecting their achievement.

MATHEMATICS

Anyone can be a mathematician mostly people do not agree with this. But, I insist that anyone with average intelligence if properly guided can master the science of mathematics.

The history of human civilization reveals the necessity of counting, measuring, weighing and drawing in all aspects of environment. Mathematics is an integral part of the world, and its every aspect is quantitative.

Mathematics has not become important only today but it occupied and kept this important place from the earlier times and is perhaps the only subject which merits this destination.

ACHIEVEMENT IN MATHEMATICS

According to Crow and Crow (1956) Achievement means the extent to which learner is profiting from instructions in a given area of learning.

According to Kulkarni (1970) Achievement in mathematics refers to understanding of mathematical concepts, application of knowledge to new situations and logical reasoning as involved in interpretation of data, identification of missing links etc.

Good's Dictionary of Education (1973) defines achievement as the knowledge attained or skills developed in school subjects usually designated by the test scores or by marks assigned by the teacher or by both.

Garret (1981) defined achievement as the actual performance; it is what a person does regardless of his capabilities. Most psychologists agree that it is the people's need for achievement that give rise to some of the strongest social motive. The need for achievement motivates people to strive for bigger and better accomplishment.

MATHEMATICAL CREATIVITY

Poyla (1957) defined mathematical Creativity as the ability to solve problems requiring independence, judgment, originality and creativity.

Torrance (1962) expressed mathematical creativity as the process of sensing problems in mathematical fields, searching for solutions, making guesses about them and finally communicating results.

According to Laycock (1970) Creative mathematics is the ability to analyse a given problem in many ways, observe patterns, see likeness and differences and on the basis of what has worked in similar situations to decide on a method of attack in unfamiliar situation.

Jensen (1973) defined mathematical creativity as the ability to give numerous, different and applicable responses when presented with a mathematical situation in written, graphic, or chart form.

Krutetski (1976) Mathematical creativity can be manifested in five different ways: (a) through problem posing, (b) using alternative methods, (c) by inventing proofs, by generating formulas and (d) creating unique methods to solve mathematical problems.

STATEMENT OF THE PROBLEM

ACHIEVEMENT IN MATHEMATICS AMONG SCHEDULED CASTE STUDENTS IN RELATION TO THEIR CREATIVITY IN MATHEMATICS.

OBJECTIVES

1. To investigate the significance of difference in achievement in mathematics among rural and urban scheduled caste students.

2. To find the relation between achievement in mathematics and mathematical creativity of scheduled caste students.
3. To find the relation between achievement in mathematics and mathematical creativity of rural scheduled caste secondary students.
4. To find the relation between achievement in mathematics and mathematical creativity of urban scheduled caste students.

HYPOTHESES

Directed towards the objectives of the study and on the basis of review of the related literature, following null hypotheses were formulated for the verification:-

H1. There was no significant difference between achievement in mathematics among rural and urban scheduled caste students.

H2. There will be no significant relationship between achievement in mathematics and mathematical creativity of scheduled caste students.

H3. There will be no significant relationship between achievement in mathematics and mathematical creativity of rural scheduled caste students.

H4. There will be no significant relationship between achievement in mathematics and mathematical creativity of urban scheduled caste students.

OPERATIONAL DEFINITIONS OF THE VARIABLE

Achievement in mathematics

Achievement means that what a student can acquire after completion of a particular task or course. Achievement in Mathematics is the ability of the student to understand the mathematical concepts and to apply the knowledge to new situation. It was measured by the scores obtained by the student on the mathematical achievement test to be developed by the investigator.

Mathematical Creativity

According to Sharma and Sansanwal (2012) Mathematical creativity is overcoming fixation as well as proposing and even testing unusual solutions of problems of Mathematics and the aspects of mathematical creativity namely fluency, flexibility and originality. The total scores on fluency, flexibility and originality that were measured by the S²MCT (Sharma and Sansanwal mathematical creativity test) were taken as mathematical creativity in the present study.

Fluency of thinking: As the ability to call up ideas, where the quantity and not quality or idea is emphasized. The measure of fluency was the fluency score obtained by the subject on S²MCT.

Flexibility of thinking: It is the ability to produce a diversity of ideas or categories in a situation that is relatively unstructured. Its measure was the flexibility score on S²MCT.

Originality: It is the ability to produce remotely associated or uncommon responses. The measure was the originality scores obtained by the subject on the S²MCT.

Attitude towards mathematics

Attitude towards mathematics means student’s opinion towards mathematics whether he likes or dislikes the subject mathematics. In this study the attitude towards mathematics means score obtained by the student on the scale to be developed by the investigator.

1.15 DELIMITATIONS OF THE STUDY

The present study was delimited to the following areas:

1. Creativity was considered as the mathematical creativity only.
2. The Study was restricted to scheduled caste students of P.S.E.B. of 10th class only.
3. The study was delimited to the Punjab State only.

Results and Discussions

Table 1 : Significance of difference in achievement in mathematics of rural and urban scheduled caste students (N=400)

	Mean	Standard deviation	t-ratio
Rural scheduled caste students	26.63	7.19	0.578
Urban scheduled caste students	26.95	8.64	(N.S.)

N.S. means non-significant

Table 1 reveals that the values of mean for rural and urban scheduled caste students are 26.63 and 26.95 respectively. The value of t- ratio is 0.578 which is non significant at both the levels of significance. Thus there is no significance difference in the achievement in mathematics of rural and urban scheduled caste students. This leads to acceptance of null hypothesis 1 which states that ‘There will be no significant difference between achievement in mathematics of rural and urban scheduled caste students’.

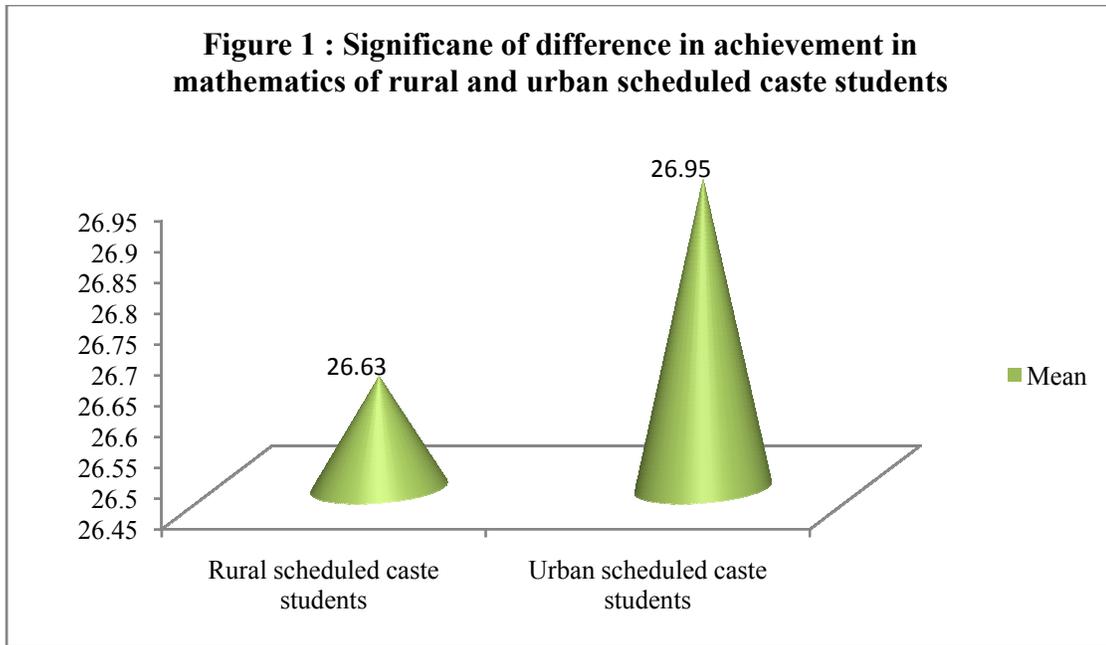


Table 2 : Significance of relationship between achievement in mathematics and mathematical creativity of scheduled caste students

Variables	N	R
Achievement in mathematical	800	0.112**
Fluency dimension of creativity in mathematics		
Achievement in mathematical	800	0.185**
Flexibility dimension of creativity in mathematics		
Achievement in mathematical	800	0.114**
Originality dimension of creativity in mathematics		

***Significant at 0.01 level of significance*

Table 2 reveals that for scheduled caste students the value of correlation for achievement in mathematics and fluency dimension of creativity in mathematics is 0.112 . the value of correlation for achievement in mathematics and flexibility dimension of creativity in mathematics is 0.185. The value of correlation for achievement in mathematics and originality dimension of creativity in mathematics is 0.114. All these values are significant at 0.01 level of significance. Thus there exist significant positive relation between achievement in mathematics and mathematical creativity for scheduled caste students. This leads to the rejection of null hypothesis 2 which states that ‘There will be no significant relationship between achievement in mathematics and mathematical creativity of scheduled caste students.’

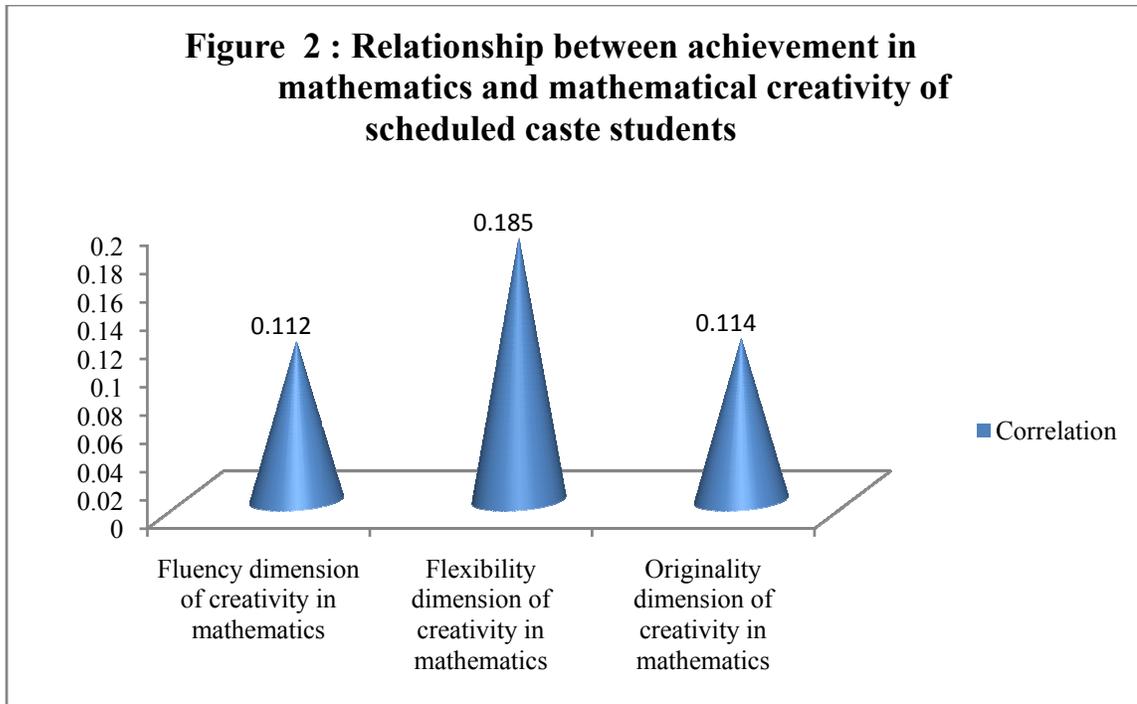


Table 3 : Significance of relationship between achievement in mathematics and mathematical creativity of rural scheduled caste students

Variables	N	R
Achievement in mathematical	400	0.107*
Fluency dimension of creativity in mathematics		
Achievement in mathematical	400	0.107*
Flexibility dimension of creativity in mathematics		
Achievement in mathematical	400	0.120*
Originality dimension of creativity in mathematics		

**Significant at 0.05 level of significance*

Table 3 reveals that for rural scheduled caste students the value of correlation for achievement in mathematics and fluency dimension of creativity in mathematics is 0.107. The value of correlation for achievement in mathematics and flexibility dimension of creativity in mathematics is 0.107. The value of correlation for achievement in mathematics and originality dimension of creativity in mathematics is 0.120. All these values are significant at 0.05 level of significance. Thus there exist significant positive relation between achievement in mathematics and mathematical creativity for rural scheduled caste students. This leads to the rejection of null hypothesis 3 which states that ‘There will be no significant relationship between achievement in mathematics and mathematical creativity of rural scheduled caste students.’

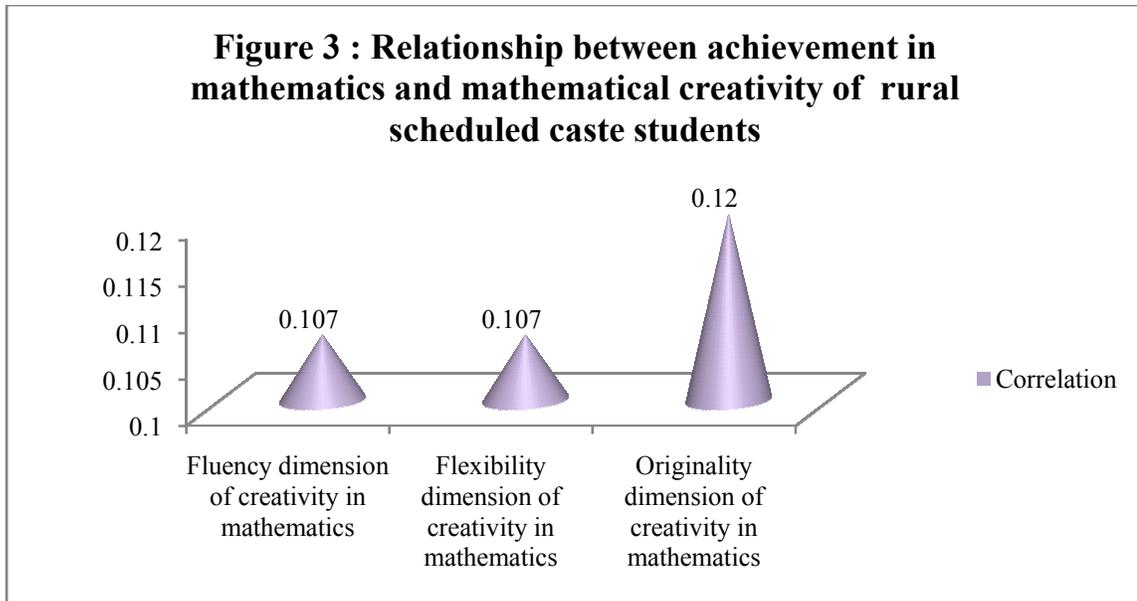


Table 4 : Significance of relationship between achievement in mathematics and mathematical creativity of urban scheduled caste students

Variables	N	R
Achievement in mathematical	400	0.115*
Fluency dimension of creativity in mathematics		
Achievement in mathematical	400	0.515**
Flexibility dimension of creativity in mathematics		
Achievement in mathematical	400	0.120*
Originality dimension of creativity in mathematics		

*Significant at 0.05 level of significance

**Significant at 0.01 level of significance

Table 4 reveals that for urban scheduled caste students the value of correlation for achievement in mathematics and fluency dimension of creativity in mathematics is 0.115. The value is significant at 0.05 level of significance. The value of correlation for achievement in mathematics and flexibility dimension of creativity in mathematics is 0.515. The value is significant at 0.01 level of significance. The value of correlation for achievement in mathematics and originality dimension of creativity in mathematics is 0.120. The value is significant at 0.05 level of significance. Thus there exist significant positive relation between achievement in mathematics and mathematical creativity for rural scheduled caste students. This leads to the rejection of null hypothesis 4 which states that ‘There will be no significant relationship between achievement in mathematics and mathematical creativity of urban scheduled caste students’.

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