Research Paper

Low Achievement in Mathematics at Secondary Level

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Abstract

Mathematics is seen by society as the foundation of scientific technological knowledge that is vital in social-economic development of a nation. In fact, studies suggest that mathematics as a subject affects all aspects of human life at different levels. The sample of the present study consisted of 50 secondary school students of class 12th classes from 04 Govt.and private schools in Ujjain district. The data were collected though Intelligence Test, Academic Achievement Motivation and Socio-Economic Status Scale. Data were analysed mean, SD and t-ratio. . The intelligence levels of the low achievers in mathematics do not differ significantly in relation to their gender, locale and type of school. The male and female low achievers in mathematics differ significantly in relation to their academic achievement motivation.

Introduction

The mathematics is a backbone of students to achieve & develop the skill in reasoning and thinking level. In elementary stage, the base on mathematics should be imposed for development of mental observation, creativity and innovativeness. Students' mathematical achievements in secondary school have an influential effect on their performance in college and their future careers. Having a solid background in mathematics helps students develop sophisticated perspectives and offers more career options.

Secondary education remains the responsibility of state governments and the Ministry of Human Resource Development. As secondary education prepares students for higher education as well as for the world of work, it becomes essential that school leavers should acquire a higher level of knowledge and skills to face the challenges of life confidently. To achieve this aim, qualitative education is made available, accessible and affordable to all young people in the age group of 15-16 years. Rashtriya Madhamik Shiksha Abhiyan (RMSA) has been launched in 2009 to achieve the target of Universal Secondary Education.

Importance of Mathematics

Science and Mathematics have always been important areas of study for students both in elementary and secondary schools. As the 21st century draws closer, citizens of the whole world, have a greater need of high quality science and mathematics. According to Steen (1989) mathematics does not only empower people with the capacity to control their lives but also provides science a firm foundation for effective theories, and also guarantees society a vigorous economy. Therefore, special attention is being paid to Mathematics and Science because these two subjects play a vital role in the development of any country.

Low Achievement in Mathematics

Achievement is generally used in the sense of "ability to do, capacity to do or tendency to do". Academic achievement means level of success of proficiency attained in some special area concerning scholastic or academic work. On the other hand, low achievement means when a student passes the examination by attaining low marks. The students getting marks between 33-40 are considered as low achievers.

Intelligence

Intelligence is an umbrella term which describes a property of the mind including related abilities, such as the capacities for abstract thought, understanding, communication, reasoning, learning, learning from past experiences, planning and problem solving.

Academic Achievement Motivation

Motivation can be defined as the driving force. Generally, motivation is derived from the word 'movere' which means 'to move'. It is the process of raising action, maintaining activity in progress, regulating and directing pattern of activity transformations in the

tissues of the organism. It is an art of inculcating and stimulating interest in studies and in other such activities in the pupils. It is generally agreed that motivation has positive impact upon learning-it stimulates, sustains, and give direction to an activity.

Socio-Economic Status

In modern society, the status is acquired on the basis of occupation, membership of certain associations and organisations, the area in which his house is located, type of house in which a person lives, the ownership of various household materials, e.g., T.V.,car, telephone, cell phone, etc. as well as the education, the type of schools in which he had studied, type of newspaper, caste and prestige acquired by the individuals. The economic factor plays an important role in determining social status, which includes the total income of the family, savings and capacity to collect money in emergency.

Significance of the Study

It is clear that secondary education is of decisive importance in the economy of developing countries. At the secondary stage science and maths are important because they play an important role in the development of critical reasoning in the minds of the people. In modern times, the future of every country depends on scientific and technological development. In fact the distinction between the developed and under developed and developing countries is largely based on their achievements in the field of science. Mathematics is the pillar of science. The study of mathematics as a subject has a unique position in any school curriculum. Many methods and techniques have been used to develop the mathematical and scientific attitude among students. Since many efforts are being made by our government to improve the standard of mathematics at school level, it is disappointing to see a high percentage of students continuously failing in mathematics for more than 20 years. In spite of efforts made by government the problem still persists. The achievement of students in mathematics is low, though mathematics occupies a place of importance all over the country. In Punjab also the achievement of students in mathematics is always low in comparison to other subjects. It is clear that our efforts to improve the status of mathematics at school levels over the past decades have been largely ineffective.

Review of Literature

Hriday Kant Diwan, Namrita Batra & Inder Singh Chabra (2012), in the study "Mathematics up to the Secondary Level in India" highlighted the paucity of trained and qualified mathematics teachers

to meet the challenges of new teaching- learning strategies set by the NCERT. The study also highlighted the gender and socio-economic disparities existing in the Indian society which have been barriers to achieve the goal of education.

Akhtar et al. (2011) aimed to explore the effects of socioeconomic status (SES) on learning achievement of students. The population was the secondary school students enrolled in four

districts of Pakistan. Multistage sampling technique was used to select 1580 students. The SES questionnaire was delivered to sampled students. It was filled by their parents. The five class SES structure was used to categories the students socio-economic status. The obtained scores on Secondary School Certificate (SSC) examination were used as students learning achievement. By the Pearson's correlation data was analyzed. The findings showed that upper class students are A and B grade achievers. The middle class students showed significant positive relationship with D grade. The lower class students remained low achievers. In this way the study verify the results of different studies in other countries that socio-economic status effects learning achievement. The above discussion showed that the lower middle class is struggling more. They are concerned with their achievement. Their performance is better than other groups. This shows the socio-economic status affects the learning achievement of students. It is concluded that a relationship exists between the socioeconomic status and learning achievement of secondary school students.

Charan (2011) studied the effect of intelligence and academic motivation on academic achievement of tribal and non-tribal students of standard X. The research was conducted on a sample of 250 tribal and 250 non-tribal students studying in secondary schools of Panchmahal district. The findings show that there is significant effect of intelligence on the level (High, Medium Academic Achievement) of the Academic Achievement between tribal and non-tribal students. There is significant effect of academic motivation on the levels of the academic achievement of tribal and non-tribal students.

Alam (2009) conducted a study on the relationship between academic achievement, creativity and academic achievement motivation. The students of class X drawn from different government schools of Darbhanga district in Bihar. Their age ranged from 15 to 16 years. Only the government schools were surveyed for the sake of similarity in infra structure and educational environment of the students. Creativity Test by Mehdi, Achievement Motivation Scale by Beena Shah was taken as tools. Aggregate marks of the annual examination were collected from official records of schools. Results indicated the correlation of academic achievement with creativity and achievement motivation of the students. Creativity has significant positive relationship with academic achievement for the total sample boys, girls, urban and rural students. In case of achievement motivation and academic achievement of the students, the coefficients of correlation for the total and sub-samples are again

significant and positive. The significant positive relationship shows that academic achievement increases with achievement motivation and vice-versa.

Wendy and Johnson (2007) investigates 436 (188 males, 248 females) participants (ages were between 18-79 from Australia, Great Britain and North America). Their result have shown that there was a very small gender difference in general mental ability but males clearly performed better on Visio-spatial tasks while females performed better on tests of verbal usage and perceptual speed.

Objectives of the Study

1. To identify the low achievers in Mathematics in secondary schools.

2. To study intelligence, academic achievement towards mathematics and socio-economic status of the subjects having low achievement in mathematics.

3. To compare intelligence, academic achievement motivation, towards mathematics and socio-economic status of low achievers in mathematics in relation to their gender, locale and type of school.

Hypotheses of the Study

H01: There is no significant difference in intelligence level of low achievers in mathematics in relation to their gender, locality and type of school.

H02: There is no significant difference in academic achievement motivation of low achievers in mathematics in relation to their gender, locality and type of school.

H03: There is no significant difference in socio-economic status of low achievers in mathematics in relation to their gender, locality and type of school.

Variables of the Study

In the present study Intelligence, academic achievement motivation and socio-economic status was Independent variable while low achievers in mathematics were dependent variable.

Methodlogy

Descriptive Survey method was used in this study. Class XII Students, belonging to different government and private schools of MP Board of Education in Ujjain district constituted the population of the study. Students from two genders were included in the sample. The collected data, through Intelligence Test, Academic Achievement Motivation Test and Socio-Economic Status Scale, were analyzed to find out the relationship among Intelligence of the low achievers in mathematics, Academic Achievement Motivation of the low achievers in mathematics and Socio-Economic Status of the low achievers in mathematics. Mean and standard deviation were calculated to achieve the

objective of the study. T-test technique was also applied to find out the significant difference among the means.

Sample and Sample Size

In the present study the population comprised the students who passed the matriculation examination with low achievement in mathematics. Sample of 50 students from Ujjain district who have passed matriculation examination from MP Board of Education during 2018-19 have been taken. The students who have scored 33-40 marks in Mathematics subject and more than 40% in other subjects (at least four subjects) have been selected as sample. Equal number of male and female low achievers in mathematics has been selected from rural and urban areas and from government and private schools for this study. The intelligence levels of the low achievers in mathematics do not differ significantly in relation to their gender, locale and type of school.

Statistical Tool

 The following tools were used to collect data related each variable of the study.

1. Intelligence Test of Ojha and Chowdhury (2006).

2. Sharma Academic Achievement Motivation Test (1984).

3. Socio-Economic Status Scale by Meenakshi (2009).

Analysis and Interpretation

Table No. 01

Comparison of Intelligence Scores of Low Achievers in Mathematics in Relation to their Gender

Gender	N	Mean	SD	t-value	p-value
Male	25	32.15	4.35	0.1679	0.8674
Female	25	31.96	3,62		

The t-value signifying the difference between intelligence level of male low achievers and female low achievers is 0.1679 which is not significant (p> 0.05). This shows that males and females do not differ significantly in relation to their intelligence level. It shows that male and female low achievers in mathematics are equally intelligent. Null hypothesis **H01** is accepted.

Table No. 02

Comparison of Intelligence Scores of Low Achievers in Mathematics in Relation to their Locale

Locale	N	Mean	SD	t-value	p-value
Rural	30	36.22	2.55	0.2943	0.7698
Urban	20	35.98	3.20		

The t-value signifying the difference between intelligence level of urban low achievers and rural low achievers is 0.2943 which is non-significant (p>0.05).This shows that the intelligence scores of low achievers do not differ significantly in relation to their locale. Null hypothesis **H01** is accepted.

Table No. 03

Comparison of Intelligence Scores of Low Achievers in Mathematics in Relation to Type of School

School	N	Mean	SD	t-value	p-value
Government	40	29.78	2.46	0.3066	0.7604
Private	10	30.04	2.11		

The t-value signifying the difference between intelligence level of low achievers of government schools and private schools in mathematics is 0.3066 which is not significant

(p> 0.05).This shows that intelligence scores of low achievers do not differ significantly in relation to their type of school. Null hypothesis **H0**1 is accepted.

Table No. 04

Comparison of Academic Achievement Motivation Scores of Low Achievers in Mathematics in Relation to their Gender

Gender	N	Mean	SD	t-value	p-value
Male	25	33.15	3.69	2.1893	0.0335
Female	25	35.28	3.17		

The t-value calculated as 2.1893 which is significant at 0.05 level (p<0.05). This shows that male low achievers and female low achievers differ significantly in relation to their academic achievement motivation. The female low achievers have more academic achievement motivation as compared to male low achievers. Null hypothesis **H02** is rejected.

Table No. 05

Comparison of Academic Achievement Motivation Scores of Low Achievers in Mathematics in Relation to their Locale

Locale	N	Mean	SD	t-value	p-value
Rural	30	31.05	3.08	2.2384	0.0299
Urban	20	28.77	4.12		

The t-value signifying the difference between academic achievement motivation of urban low achievers and rural low achievers is 2.2384 which is significant at 0.01 level (p<0.05).This shows that urban and rural low achievers differ significantly in relation to their academic achievement motivation. shows that rural low achievers in mathematics have better academic achievement motivation as compared to urban low achievers in mathematics. So urban low achievers in mathematics are less motivated than rural low achievers. Null hypothesis **H02** is rejected.

Table No. 06

Comparison of Academic Achievement Motivation Scores of Low Achievers in Mathematics in Relation to Type of School

School	N	Mean	SD	t-value	p-value
Government	40	34.51	2.44	0.4679	0.6420
Private	10	34.09	2.93		

The t-value signifying the difference between academic achievement motivation of low achievers of government and private schools is calculated 0.4679 which is not significant (p>0.05).This shows that academic achievement motivation of low achievers in mathematics do not differ significantly in relation to their type of school. Null hypothesis **H02** is accepted.

Table No. 07

Comparison of Socio-Economic Status of Low Achievers in Mathematics in Relation to their Gender

Gender	N	Mean	SD	t-value	p-value
Male	25	36.84	3.27	0.3983	0.6922
Female	25	36.48	3.12		

The t-value signifying the difference between socio-economic-status of male and female low achievers in mathematics is 0.3983 which is not significant even at 0.05 level of significance ($p>0.05$) indicates that there is no significant difference in the socio-economic status scores of male and female low achievers in mathematics. This shows that socio-economic-status of low achievers in mathematics does not differ significantly in relation to their gender. Null hypothesis **H03** is accepted.

Table No. 08

Comparison of Socio-Economic Status of Low Achievers in Mathematics in Relation to their Locale

Locale	N	Mean	SD	t-value	p-value
Rural	30	34.49	2.88	2.5168	0.0152
Urban	20	36,82	3.65		

The t-value signifying the difference between socio-economic status of urban low achievers and rural low achievers is 2.5168 which is significant at 0.05 level ($p<0.05$).Urban low achievers in mathematics belong to high socio-economic status as compared to rural low achievers in mathematics. This shows that urban and rural low achievers in mathematics differ significantly in relation to their socio-economic status. Null hypothesis **H03** is rejected.

Table No. 09

Comparison of Socio-Economic Status of Low Achievers in Mathematics in Relation to their Type of School

School	N	Mean	SD	t-value	p-value
Government	40	29.11	1.89	3.8333	0.0004
Private	10	32.01	2.99		

The t-value signifying the difference between socio-economic-status of low achievers of government and private schools is 3.8333 which is significant (p<0.05) indicating that socio-economic status of low achievers in mathematics differ significantly in relation to their type of school. Low achievers studying in private schools have higher scores of socio-economic status as compared to the low achievers studying in government schools. Null hypothesis **H03** is rejected.

Findings

1. The intelligence levels of the low achievers in mathematics do not differ significantly in relation to their gender, locale and type of school.

2. The male and female low achievers in mathematics differ significantly in relation to their academic achievement motivation.

3. It is indicated that urban and rural low achievers differ significantly in relation to their academic achievement motivation. Urban low achievers in mathematics are lowly motivated as compared to rural areas.

4. Academic achievement motivation of low achievers in mathematics does not differ significantly in relation to their type of school.

5. Socio-Economic Status of low achievers in mathematics does not differ significantly in relation to their gender.

6. Urban and rural low achievers differ significantly in relation to their socio-economic status.

7. Socio-Economic-Status of low achievers in mathematics differs significantly in relation to their type of school.

Limitations of the Study

1. The study was confined to the students who were low achievers in mathematics in the matriculation examination of MP Board of Education in the March 2018-2019.

2. While studying the causes of low achievement in mathematics, the study was delimited to variables namely intelligence, academic achievement motivation, attitude towards mathematics and socio-economic status and perceptions of parents, teachers and students about the causes of low achievement in mathematics.

3. The study was restricted to Ujjain district.

Conclusion

1. Intelligence of low achievers in mathematics is positively related to their academic achievement motivation.

2. Intelligence of female low achievers is correlated significantly at 0.01 level whereas intelligence of male low achievers in mathematics is not significantly correlated to their academic achievement motivation.

3. Intelligence of urban low achievers in mathematics and of government schools is also significantly correlated to academic achievement motivation.

4. Intelligence of low achievers in mathematics belonging to rural and private schools is not significantly correlated to academic achievement motivation.

5. Intelligence of all low achievers in mathematics as well as male low achievers in mathematics is also correlated significantly with socio-economic status. Whereas intelligence of female, rural, urban, govt. and private low achievers in mathematics is not correlated significantly to socio-economic status.

6. Academic achievement motivation mathematics of all low achievers in mathematics and male, female, urban low achievers in mathematics and low achievers in mathematics studying in private schools is correlated significantly but academic achievement motivation mathematics of low achievers of government schools and low achievers belonging to rural schools is non- significant.

7. The relationship between academic achievement motivation and socio-economic status for entire group is totally negative and non-significant. Academic achievement motivation of only male low achievers in mathematics is negative but correlated significantly to their socio-economic status.

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