

SECONDARY SCHOOL STUDENTS ACHIEVEMENT IN MATHEMATICS IN RELATION TO THEIR PARENTAL INVOLVEMENT

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ABSTRACT

This study examines the achievement in mathematics of ninth class Private school students in relation to their parental involvement. The findings were based on the responses of 472 Private school adolescents (241 were males and 231 were females) selected from ten Private schools of Chandigarh. Parental Involvement Scale and Mathematics Achievement test developed and standardized by the investigator were used for data collection. Results show that achievement in mathematics of adolescents studying in Private schools is significantly and positively related with general welfare, monitoring, leisure time activities, psychological autonomy and academic growth dimensions as well as parental involvement (total). The study concluded that there is significant difference in achievement in mathematics of ninth class Private school students in relation to their parental involvement.

INTRODUCTION

The second decade of living is a time when the person lessens his emotional (if not material) dependence on his parents and develops an established set of values and responsible self-direction. This is a period when adolescents begin to think operationally. Intelligence reaches its climax during this period. Intellectual powers like logical thinking, abstract reasoning and concentration are almost developed up to end of this period. The power of critical thinking and observation are developed. This is also the age of specialization. By now, aptitudes begin to show and the individual has developed his reasoning and stabilized his interest and begins to conceive great ideals and aspires for doing something in life (Vishala, 2008). The effect of globalization, modernization and the media boom has made the life of adolescents, their

expectations and values very different from those of older generation. Understanding adolescents empathetically and helping them to develop life skills to deal with the conflicting situations occurring due to oneself, peers, society and parents is not only the responsibility of schools but also of parents themselves (Yadav,2010). When parents are involved in education, teens are more likely to behave better, do well in school and develop better social skills (Gustafson, 2014).

Mathematics is one of the compulsory subjects of secondary education. The main aim of teaching mathematics at secondary school level is to train the mind, develop the power of understanding and critical thinking among pupils. Mathematics is essentially a program of education, which fosters higher order mental processes such as questioning, reasoning, analyzing, inducing and logical thinking (Mishra & Jain, 2013). Children, as they progress through the elementary years of schooling are also undergoing various developments within themselves as well as in their social interactions. If these experiences are brought into their learning of school subjects, particularly mathematics, it may make the learning not only interesting and motivating but also will be perceived as relevant and useful by the learners (Chakraborty, 2011).

Mathematics Achievement

Mathematics achievement refers to understanding of mathematical concepts and knowledge attained in the subject. It is also the level of skill developed and application of knowledge to the new situations.

According to Kulkarni (1970), “Mathematical achievement 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.”

Parental involvement

Parental involvement includes an extensive array of behaviors but generally refers to parents and family members’ use and investment of resources in their children’s schooling. These investments can take place in or outside the school, with the objective of improving children’s teaching and learning. Parental involvement at home can comprise of activities such as deliberations about school, helping with home tasks and reading with children. Involvement at

school may include parents volunteering in the classroom, attending workshops, or attending school plays or supporting events. It also includes school based involvement, focused on such activities as driving on a fieldtrip, coming to school for scheduled conferences or informal conversations, volunteering at school, and serving on a parent teacher advisory board (Hoover-Dempsey, Bassler& Burrow, 1995).

Kulkarni(1992) define parental involvement as parent's dedication and as a facilitator of both identification and internationalization of social values.

Grolnick and Slowiaczek (1994) define parental involvement as the allocation of resources to the child's academic endeavors. In other words, it denotes the extent to which parents take a keen interest and actively participate in their child's education.

Grolnick and Slowiaczek (1994) stated a multidimensional depiction of parental involvement that focuses not on one particular activity, but on various dimensions. According to this conceptualization, parents may show their involvement in the child's schooling in four different ways through:

- 1) **Behavioral involvement:** Parents may manifest their involvement through their behavior i.e. their overt actions may serve as indices of their involvement. This would include engaging in activities such as going to the child's school, meeting their teachers, attending parent-teacher meetings.
- 2) **Personal involvement:** The affective experience and emotional climate at home is the personal involvement of parent in children's schooling. This encompasses activities such as knowing about the child's day-today activities; his whereabouts; friends; what he usually does at school; how well he gets along with others; how well he is doing in studies; how regular and apt he is in his school; how well he performs in the examinations and the like.
- 3) **Cognitive simulation:** Exposing the child to cognitively stimulating activities and materials represents a new role of parents in fostering children's cognitive development. Parental cognitive simulation refers to the efforts by the parents to focus their infants' attention to objects and events within the environment. These attempts can be physical or verbal in nature. By directing the child's attention to specific objects and activities,

parents try to stimulate the child's thought and expression in ways that may lead to his/her academic learning.

- 4) **Intellectual involvement:** Parents may themselves engage in various types of cognitive activities such as reading newspaper, books magazines or going to the library and the like. This form of intellectual involvement of parents may also be crucial for the child's scholastic development.

Review of related literature

Alexander (2000) examined the separate and combined effects of parental involvement, family structure and parent's educational background on student's academic performance. The effects of parental involvement (more involved, less involved), family structure (single parent, two parents, grandparents/guardian) and parents' educational attainment (less than high school, high school, less than college/ college graduate) on the academic performance of 4th grade students in the reading, writing and in mathematics. Results showed that fourth grade students whose parents were less involved in school activities performed better on the mathematics section than did those whose parents were highly involved in school activities. The combination of the variables parental involvement, family structure and parents' educational attainment has no influence on the academic performance of fourth grade students in the reading, writing and in mathematics.

Jones and White (2000) conducted a study on family compositions, parental involvement and young children's academic achievement and examined whether first to third graders' language and mathematics achievement was affected by family context and type of school related activities practiced by parents. Results showed that achievement was related to family size, number of adult care givers and parent's educational level. Students with parents engaging in bearing activities at home were more likely than others to obtain high language and mathematics achievement scores.

Komako (2001) investigated parental involvement and group work as support systems applicable in the learning and teaching of mathematics. The findings indicated an association between mathematics achievements and the availability of or lack of parental support. Of all the four schools there seemed not to be a significant difference as far as dynamic variables (parents' motivation, parents' intellectual interest, parents' capacity for guidance, language efficiency and

work) that were tested are concerned. The learners in school type I (schools in upper stratum and better facilities and highly funded by the government) scored high than those in school type II (schools in lower stratum and less facilities and low funding from government).

Okpala, Okpala and Smith (2001) investigated the influence of parent involvement on the mathematics achievement of fourth graders in a low income North Carolina county. Results showed that instructional supplies, expenditures per pupil and parental volunteer hours were not statistically significant in explaining test scores. However, low income was negatively related to student's academic achievement in mathematics.

Randle (2001) conducted a study to find out independent and combined effects of parental involvement, ethnicity and marital status of the parents on the academic performance of selected high school students in reading, writing and mathematics. Results showed that only parents' ethnicity had some influence on the reading, math and writing scores of high school students.

Haghighat (2005) conducted a study on social capital and pupil's academic performance using nationally representative sample of eighth graders in the United States. Results showed that with other things equal, school environment has a significant and positive effect on mathematics and reading test scores of pupils. School outreach shows a positive and significant effect on mathematics achievement as well, but not on the pupil's reading test scores. Parental involvement initiated mainly by the parents does not show a significant result.

Powell (2010) studied the effect of parental involvement on mathematics achievement of African American middle school students and found that parental involvement has little or no influence on students' mathematics achievement.

Objectives

1. To find out the relationship of achievement in mathematics of ninth class private school adolescents with parental involvement.
2. To study achievement in mathematics of ninth class private school adolescents in relation to parental involvement.

Hypotheses

1. There exists significant positive relationship of achievement in mathematics with parental involvement of ninth class adolescents studying in private schools.
2. There exists significant difference in achievement in mathematics of ninth class private school adolescents in relation to their parental involvement.

Design of Study

A systematic procedure to collect data, which helps to test hypotheses of the study under investigation, was adopted. The method was essentially descriptive survey method.

Sample

In the present study, 472 private school adolescents (241 were males and 231 were females) selected from ten private schools of Chandigarh. The ninth class students were taken. Two -stage random sampling technique was employed.

Tools Used

The following tools were used to collect data:

1. Parental Involvement Scale developed and standardized by the investigator.
2. Mathematics Achievement test developed and standardized by the investigator.

Statistical techniques

To analyze the data statistically Mean, Standard Deviation, t-ratio and coefficient of correlation were computed and the results were interpreted accordingly.

RESULTS AND DISCUSSION

Table 1: *Correlation of Achievement in Mathematics with Different Dimensions of Parental Involvement of Ninth Class Adolescents Studying in Private Schools (N=472)*

Variables	Achievement in Mathematics
Parental Involvement	
General welfare	0.159**
Monitoring	0.160**
Psychological autonomy	0.123**
Leisure time activities	0.255**
Academic growth	0.199**
Parental involvement(total)	0.287**

**** Significant at 0.01 level**

Table 1 shows that achievement in mathematics of adolescents studying in private schools is positively and significantly related with different dimensions of parental involvement. The significant and positive correlation of achievement in mathematics with general welfare dimension of parental involvement suggests that the more the parents of adolescents interact with their children, fulfill their requirements, and spend time with them, the higher is their achievement in mathematics. A positive and significant correlation of mathematics achievement with monitoring dimension of parental involvement indicates that the more the parents of adolescents monitor about their whereabouts, the type of friends they make, and accomplishments in school subjects, the higher they score in mathematics.

There is a positive and significant relationship of psychological autonomy dimension of parental involvement with mathematics achievement. It indicates that the higher the freedom is given to adolescents to make decisions in their work, the higher is their achievement in mathematics. Further, a positive and significant relationship of leisure time activities dimension of parental involvement with mathematics achievement of adolescents studying in private schools, suggests that adolescents whose parents are more involved in all their recreational activities and after school activities, have higher achievement in mathematics.

The positive and significant relationship of academic growth dimension of parental involvement with mathematics achievement of adolescents studying in private schools also

suggests that the more parents encourage their children to work hard for good academic performance, and provide congenial environment for the study, the higher they achieve in mathematics. In addition, a significant and positive correlation between total parental involvement and mathematics achievement of adolescents studying in private schools indicates that the more the parents are involved in the studies of adolescents, the higher is their achievement in mathematics.

Thus, it can be concluded that mathematics achievement of adolescents studying in private schools is significantly related with different dimensions of parental involvement, i.e. general welfare, monitoring, psychological autonomy, leisure time activities, academic growth and total parental involvement.

On the basis of above discussion, it can be concluded that all the dimensions of parental involvement are significantly related with mathematics achievement of adolescents studying in private schools. This implies that the more the parental involvement, the higher is the achievement in mathematics of ninth class adolescents studying in private schools. Hence, the Hypothesis 1, namely, “There exists significant positive relationship of achievement in mathematics with parental involvement of adolescents studying in private schools” has been accepted.

Table 2

Mean Differentials in Achievement in Mathematics of Ninth Class Private School Adolescents with Low and High Scores in Different Dimensions of Parental Involvement

Dimensions of Parental Involvement	M₁ (N=127)	M₂ (N=127)	SD₁	SD₂	t value	Level of Significance
General welfare	35.57	43.09	12.23	12.23	4.89	0.01
Monitoring	35.76	42.20	12.45	12.86	4.05	0.01
Psychological autonomy	36.09	40.79	12.69	13.46	2.86	0.01
Leisure time activities	34.46	43.24	12.70	12.91	5.46	0.01
Academic growth	33.76	42.02	12.62	12.69	5.19	0.01
Parental involvement(total)	32.41	44.40	12.25	12.45	7.73	0.01

M₁= Mean mathematics achievement scores of private school adolescents with low scores in different dimensions of parental involvement.

M₂= Mean mathematics achievement scores of private school adolescents with high scores in different dimensions of parental involvement.

SD₁= Standard deviation of in mathematics achievement scores of private school adolescents with low scores in different dimensions of parental involvement.

SD₂= Standard deviation of achievement in mathematics scores of private school adolescents with high scores in different dimensions of parental involvement.

Entries made in Table 2 show that all the mean differentials calculated between the mean scores of achievement in mathematics of private school adolescents with low and high scores in different dimensions of parental involvement, i.e. general welfare, monitoring, psychological autonomy, leisure time activities, academic growth, and total parental involvement were significant at 0.01 level of significance.

Table 2 shows that the mean score of achievement in mathematics of adolescents with high scores in general welfare dimension of parental involvement is higher than the mean score

of adolescents with low scores in this dimension of parental involvement. This suggests that adolescents whose parents are more involved in the general welfare i.e. interact with their children, fulfill all their requirements, make sacrifices to keep them happy and, spend more time with them as compared to those whose parents are less involved in the general welfare of their children show significantly higher achievement in mathematics.

The higher mean score of mathematics achievement of private school adolescents with high scores in monitoring dimension of parental involvement as compared to those with low scores in this dimension suggests that achievement in mathematics of those adolescents whose activities are monitored more by their parents is higher than their counterparts who are less monitored by their parents.

Table 2 further shows that the mean score of achievement in mathematics of private school adolescents with high scores in psychological autonomy dimension of parental involvement is higher than the mean score of adolescents with low scores in this dimension. This suggests that achievement in mathematics of the adolescents whose parents give them more freedom to make decisions in their work is higher than their counterparts. The higher mean scores of mathematics achievement of adolescents with high scores in leisure time activities dimension of parental involvement as compared to those private school adolescents with low scores in this dimension suggests that mathematics achievement of those adolescents whose parents are more involved in the recreational activities of their children is higher than their counterparts.

Results further reveal that the mean score of mathematics achievement of private school adolescents with high scores in academic growth dimension of parental involvement is higher than the mean score of adolescents with low scores in this dimension of parental involvement. This suggests that achievement in mathematics of those adolescents who are more encouraged to work hard, are given reward for showing good performance in studies and are provided with congenial environment for the study is better than their counterparts whose parents are less involved in the academic growth of their children.

The mean score of mathematics achievement of private school adolescents with high scores in total parental involvement is higher than the mean score of adolescents with low scores in total parental involvement. This suggests that achievement in mathematics of the adolescents whose parents are more involved in the activities of their children is better than their counterparts whose parents are less involved.

On the basis of discussion of results based on Table 2, it can be concluded that achievement in mathematics of private school adolescents with high scores in parental involvement i.e. the adolescents whose parents take keen interest in their day to day activities, interact more with them, monitor all their activities, give more freedom to their wards in making independent decisions and are more involved in recreational activities of their children and promote academic growth of their children is higher as compared to their counterparts with low score. This suggests that achievement in mathematics of private school adolescents with high and low scores in parental involvement differ significantly i.e. more parental involvement leads to higher achievement in mathematics. Hence, Hypothesis 2, namely, “There exists significant difference in achievement in mathematics of ninth class private school adolescents in relation to parental involvement.” has been accepted. The above findings contradict the findings by Alexander (2000) who has reported that students whose parents were less involved in school activities performed better on the mathematics section than did those whose parents were highly involved in school activities. The present results support the findings of Jones and White (2000) who have reported that students with parents engaging in bearing activities at home were more likely than others to obtain high mathematics achievement scores. However, the findings by Okpala, Okpala and Smith (2001) and Powell (2010) don't support the present results as they have reported that parental involvement was not statistically significant in explaining mathematics achievement.

The results of the study support the significant role played by parental involvement in the mathematics achievement of adolescents. Parents should therefore devise means by which they would be involved in the academic activities of their children also adolescents can be afforded the opportunities for independence, yet experience parent involvement strategies that help to

raise their mathematics achievement. The schools should organize orientation and training programs for parents as to how they can be involved with their children's studies.

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