

LEARNING OUTCOME, ACADEMIC PERFORMANCE AND ATTITUDE OF THE STUDENTS TOWARDS “ARITHMETICS”

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ABSTRACT

The Present study was designed to explore the attitude of the students towards Mathematics and its relationship with learning outcomes and academic performance of the students of ninth standard. Correlation design followed by the t-test analysis was applied to meet the objectives of the study using standardized tools to take the observation of the participants on the studied variables. The result showed the significant and positive relationship of attitude towards mathematics with the learning outcomes and academic performance of the participants. The participants of the Govt. school students outperformed the participants of private school on their attitude towards mathematics, learning outcomes and academic performance.

The information on arithmetic is a pivotal instrument in our social request that can be utilized in one's every day life to beat the challenges of life (Bishop, 1996) and consequently, has been considered as perhaps the main subjects in a school educational plan. In any case, standard tests and assessments revealed that students' outcome in the subject has not reached yet to their expected level. Which in science is has become a worldwide concern throughout the long term (PISA, 2003). As indicated by Annual status of Educational Report 2016 (ASER) has announced that Only 47.8% of students of class V can perform just class II level test and has declined from earlier performance of 48.1% and has fared severely in number juggling and English cognizance. The extent of class VIII students in rural India who can divide three-digit number by a solitary digit has plunged to 43.2% in 2016 from 44.2% in 2014.

NCERT National Achievement Survey (2015-2016) revealed that majority of students about to enter middle school face gigantic difficulties in fundamental science and furthermore found in the yearly report of ASER, (2016) that 27.7% students in rural India could do two-digit subtraction and 43.3% students could accurately do a 3 - digit by 1-digit division issue. Further India, intends to make the skilled workforce on the world and Govt's New Education Policy was the dire needed step in this regard but the excellence in the crucial learning outcomes is overlooked till day which requires

normalized appraisal program, cross-curricular instructing, important and successful school educational program and so forth.

Indeed, high accomplishment in mathematics is a component of many interrelated factors identified with students, families, and schools that can impact math execution. Among students factors, attitudes is a significant key factor to be considered when endeavouring to comprehend and clarify variability in student performance in maths (Nicolaidou and Philippou, 2003; Köğçe, Yıldız, Aydın, and Altındağ, 2009; L. Mohamed and H. Waheed, 2011). Attitude towards arithmetic as " a disposition towards mathematics that has been obtained by a person through one's convictions and encounters and that can be changed." Fraser and Kahle (2007) underlined that learning conditions at home, at school, and peers are the crucial factor towards difference in student's perspectives plus, class disposition. Zimmmerman (2000) asserted that perception of mathematics, self-regulation, self-efficacy, self- concept are influencing the attitude towards mathematics besides, parents, teachers and peers influence (Wilkins and Ma, 2003).

Attitudes can be viewed as more or less positive. A positive attitude towards mathematics reflects a positive emotional disposition in relation to the subject and, in a similar way, a negative attitude towards mathematics relates to a negative emotional disposition (Zan and Martino, 2008). These enthusiastic attitudes affect a person's conduct, as one is probably going to accomplish better in a subject that one appreciates, believes in or finds valuable (Fraser and Kahle, 2007). Thus, positive attitudes towards mathematics are desirable since they may affect one's eagerness to learn and furthermore the advantages one can get from mathematics. Exploration on the relationship of students' attitude and learning conclusions has likewise been uncertain. Explores that have been led to decide the connection between understudies' mentality towards Mathematics and accomplishment in Mathematics have yielded opposing outcomes. Researches that have been conducted to determine the relationship between students' attitude towards Mathematics and achievement in Mathematics have yielded contradictory results regarding attitude and Mathematics accomplishment (Minato and Yanase, 1984, Randhawa and Beamer, 1992, Schenkel, 2009). A few investigations have, notwithstanding, showed that the connection between attitude towards Mathematics and accomplishment in Mathematics was fairly feeble and couldn't be viewed as of pragmatic essentialness (Vachon, 1984; Wolf and Blixt, 1981). Mama and Kishor (1997) found that attitude towards Mathematics and accomplishment in Mathematics was emphatically and dependably connected however not hard. Subsequently, the current investigation was intended to investigate the relationship between students' attitude towards Mathematics and achievement in Mathematics with the following objectives:

- To explore the learning outcomes of 9th grade students of Govt and Private Schools in terms of their attitude towards mathematics.
- To explore the Academic performance of 9th grade students of Govt and Private Schools in terms of their attitude towards mathematics.
- To explore the difference between Govt and Private Schools in terms of their learning outcomes, academic performance and attitude in mathematics.

In order to meet the objectives of the study correlation design was used to explore the relationship of the leaning outcomes and academic performance of the students with their attitude towards mathematics followed by the t -test analysis to see the difference between Govt and Private schools in terms of these variables.

Participants:

In total 160 students 80 each selected randomly from the lists of 9th class students studying in the Govt. and Private schools of Shimla city whose parents gave their consent to participate their ward in the study.

Tools Used:

The following tools have been applied in the present study to record the observation of the participants in the studied variables:

Attitude Scale developed by Anandha and Mohaideen (2011) was used in the present study. It is a 3-point scale having 4 dimensions i.e., self-confidence, enjoyment, value and motivation. Reliability coefficient computed by split-half method and found to be 0.76 and has established content Validity by the suggestions and modification of the scale by the expert and the educators of the field. High score on the scale revealed the positive attitude towards mathematics and vice-versa. **Learning Outcome Scale** test was developed in Hindi and English following the international guidelines for the eight standard learning outcomes in mathematics having Cronbach alpha value .75. **The percentage of marks obtained** in their eight standards on the mathematics subject was taken as the academic achievement of the participants in mathematics.

Result and Discussion:

In order to understand the learning outcomes and academic performance in mathematics of the Govt and Private school Students in terms of their attitude towards Mathematics correlation analysis was computed and the t -test was analysed to see the difference of Govt. And Private schools on these variables and result was detailed and discussed in the light of available evidence.

Attitude towards Mathematics and Learning Outcomes:

The result of the correlation analysis showed the significant and positive correlation (See Table 1.) between Overall attitude towards mathematics and learning outcomes of the students of Govt. schools ($r = .677^{**}$ $P < .01$) and as well of the private schools ($r = .630^{**}$ $P < .01$) While with the sub factors of attitude towards mathematics the correlation of Self – confidence ($r = .657^{**}$ $P < .01$), enjoyment ($r = .641^{**}$ $P < .01$), value ($r = .662^{**}$ $P < .01$), and motivation ($r = .727^{**}$ $P < .01$) is also positive and significant among Govt. school students and the same is true in case of private school (See Table 1) students i.e., Self – confidence ($r = .421^{**}$ $P < .01$), enjoyment ($r = .593^{**}$ $P < .01$), value ($r = .727^{**}$ $P < .01$), and motivation ($r = .687^{**}$ $P < .01$).

Table 1.
Corelation Table of Attitude Towards Mathematics and Learning Outcomes of Govt. and Private School students.

Sr. No.	Attitude Towards Mathematics	Learning Outcomes in Mathematics	
		Govt. School Students	Private School Students
1	Overall attitude	.677**	.630**
2	Self – confidence	.657**	.421**
3	Enjoyment	.641**	.593**
4	Value	.642**	.727**
5	Motivation	.727**	.687**

** Significant at .01 level of confidence.

Further the result of the t -test analysis (See Table 3) clearly indicated the significant difference ($t = 11.747^{**}$ $< P.01$) between Govt School students and private school students (See Table 3) in terms of their learning outcomes and the mean value of Govt. school students ($M = 18.11$) is higher than the Private school students ($M = 10.39$). Besides, the t value in case of overall attitude towards mathematics also revealed the significant difference ($t = 4.093^{**}$ $P < .01$) between the Govt school and private school students in terms of their attitude towards mathematics and its sub factors viz. self – confidence ($t = 2.637^{**}$ $P < .01$), enjoyment ($t = 2.909^{**}$ $P < .01$), value ($t = 2.399^{**}$ $P < .01$) and motivation ($t = 4.929^{**}$ $P < .01$). While the mean values of Govt. school students are higher than the Privates school students in all the sub-factors i.e., enjoyment ($M = 25.48/23.45$), value ($M = 25.12/23.13$), motivation ($M = 25.75/22.45$) except Self – confidence ($M = 22.19/25.55$).

Thus, the result of the present study clearly revealed the significant and positive relation of attitude towards mathematics and its subfactors with the learning outcomes of the both govt and private school students i.e., “higher (Positive) the attitude towards mathematics higher the learning outcomes of the Govt. school students and private school students and vice -versa”.

The result of the present study does find support directly and indirectly though research is lacking in terms of learning outcomes. Nasser and Majid (2011) found that there is direct relationship between the efficiency of the students with their motivation attitude in the classes. examined the effectiveness of the education and attitude on essential learning outcomes in their participants of the study. The result empirically supported that education gets effected on both attitude toward life and essential learning outcomes which partially mediated by the attitude of the students. Langer (2017) studied the student’s attitude and its effects on their learning and achievement in mathematics and revealed that most students had positive attitude towards mathematics and that they perceived mathematics as doable. The findings also showed that the perceptions and beliefs, perceived abilities and competencies and previous performance of students in mathematics affected their level of motivation leading to low outcomes.

In general, the concepts students hold about Mathematics determine how they approach the subject. In many cases, students have been found to approach Mathematics as practical and rule focused which prevents them from experiencing the learning of Mathematics and the approaches to develop capability in the subject. Farooq and Shah (2008) found that students’ success in Mathematics depended on attitude towards the subject.

Some studies have demonstrated a strong and significant relationship between Mathematics attitude and Mathematics achievement (Randhawa & Beamer, 1992, Schenkel, 2009). Schenkel’s (2009) study of elementary school pupils, positive correlation between student attitude and student performance was found. Student beliefs and attitudes were found to have the potential to either facilitate or inhibit learning. In a comparative study of factors influencing Mathematics achievement, Burstein (1992) found that there is a direct link between students’ attitudes towards Mathematics and student outcomes. Cheung (1998) discovered the positive correlation between attitude and Mathematics achievement. The correlation showed that the more positive the attitude, the higher the level of achievement in the student. Hence, the result of the present study confirmed the positive and significant relations between the student’s attitude towards mathematics and their learning outcomes.

Attitude towards Mathematics and Academic Performance:

The “r” value showed the significant and positive correlation (See Table 2.) of overall attitude towards mathematics with the academic Performance of the Govt. school students ($r = .677^{**}$ $P < .01$)

and the private school students ($r = .630^{**}$ $P < .01$). Whereas in case of the sub factors of attitude towards mathematics the “r” value of Self – confidence ($r = .393^{**}$ $P < .01$), enjoyment ($r = .236^{**}$ $P < .01$), value ($r = .312^{**}$ $P < .01$), and motivation ($r = .356^{**}$ $P < .01$) are also positive and significant with the academic performance of Govt. school students. while the correlations are also significant and positive between the attitude towards mathematics and academic performance in case of private school (see Table 2) students i.e., Self – confidence ($r = .379^{**}$ $P < .01$), enjoyment ($r = .578^{**}$ $P < .01$), value ($r = .750^{**}$ $P < .01$), and motivation ($r = .729^{**}$ $P < .01$).

Further the result of the t-test analysis (See Table 3) clearly indicated the significant difference ($t = 11.747^{**}$ $< P < .01$) between Govt School students and private school students (See Table 3) in terms of their learning outcomes and the mean value of Govt. school students ($M = 18.11$) is higher than the Private school students ($M = 10.39$). Besides the t values also showed the significant difference ($t = 8.891^{**}$ $< P < .01$) between (See Table 3) Govt school and Private school students on their academic performance and the mean value is higher in case of govt, school students ($M = 70.75$) than the private school students ($M = 67.45$).

Table 2.
Corelation Table of Attitude Towards Mathematics and Academic Performance of Govt. and Private School students.

Sr. No.	Attitude Towards Mathematics	Learning Outcomes in Mathematics	
		Govt. School Students	Private School Students
1	Overall attitude	.466**	.644**
2	Self – confidence	.393**	.379**
3	Enjoyment	.236*	.578**
4	Value	.312**	.750**
5	Motivation	.356**	.729**

** Significant at .01 level of confidence.

The result of the present study clearly indicated the significant and positive correlation of attitude towards mathematics of both the Govt. and private school with the learning outcomes and academic performance of their students. Besides, the t value in case of overall attitude towards mathematics revealed the significant difference ($t = 4.093^{**}$ $P < .01$) between the Govt school and private school students in terms of their attitude towards mathematics and its sub factors viz. self – confidence ($t = 2.637^{**}$ $P < .01$), enjoyment ($t = 2.909^{**}$ $P < .01$), value ($t = 2.399^{**}$ $P < .01$) and motivation ($t =$

4.929** $P < .01$). While the mean values of Govt. school students are higher than the Privates school students in all the sub-factors i.e., enjoyment ($M=25.48/23.45$), value ($M=25.12/23.13$), motivation ($M = 25.75/22.45$) except Self – confidence ($M = 22.19/25.55$). Hence the result of the present study clearly revealed the significant and positive relation of attitude towards mathematics with the academic performance of the govt and private school students i.e., higher (Positive) the attitude towards mathematics higher the academic performance of the students and vice-versa.

Table 3.
t- Test Analysis of Govt. and Private School Students

Variables	Govt, school Students		Private School Students		t- Value
	Mean	Sd.	Mean	Sd.	
Overall attitude towards Mathematics	99.97	24,06	90.91	24.18	4.093**
Learning Outcomes	18.11	3.99	10.39	4.30	11.747**
Academic Performance	70.75	3.96	67.45	4.41	4.927**
Self - Confidence	22.19	7.97	25,55	4.05	2.637**
Enjoyment	25.48	3..97	23..45	4.84	2.909**
Value	25.12	5.50	23.13	4..95	2.399**
Motivation	25.75	3.97	22.45	4.42	4.929**

Nicolaidou and Philippou (2003), Students having positive attitudes towards mathematics would achieve better and reflect a significant relationship between attitudes and performance. According to Mato and De La Torre (2010) students having more positive attitude showed better academic performance and exhibited more positive attitudes towards math than those with low performance. Lipnevich et al. (2011) demonstrated the importance of attitudes in predicting academic achievement, and showed that attitudes towards mathematics explained a variance of 25% to 32% in mathematics achievement independent of student's ability in math. The correlation showed that the more positive the attitude, the higher the level of achievement in the student". (Maria de Lourdes mata et al, (2012). Kogce et al, (2009) explained the student attitudes as a key factor to be taken into

account when attempting to understand and explain the student achievement in mathematics. In fact that students' success in Mathematics depends upon the learners' attitude towards the subject as this determines their ability, willingness to learn, choice of action and response to challenges. It determines the level of engagement, interest, personal effort without which one can hardly perform (Garden & Smith, 2001). Negative dispositions induce tendencies of fear, anxiety and stress where one resorts to other non-productive practices which finally prevents them from experiencing the richness of Mathematics and many approaches that could be used to develop competencies in the subject. Consequently, the student exhibit low motivation, decreased level of participation, boredom and behaviour problems including class or lesson avoidance. It is important that failure to learn or achieve in mathematics is not confined to ability, when students build positive attitudes towards the subject, they become engaged in the subject and are motivated to excel in that because they value it, enjoy it and get interested in the subject.

Hence, from the above discussion, students' attitude towards mathematics has been emerged as a crucial factor in the success of students as is the learning ability and competence in mathematics as a subject. In true sense the learning abilities and positive minds of the students enabled them to view the subject as something learnable, achievable and were related to most of the environmental activities. The beliefs about their competencies affected their attitudes towards mathematics which in turn results in their learning outcomes and academic performance in the subject.

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