Effect of Motivational beliefs strategies on achievement level of college students in Mathematics

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ABSTRACT *The difficulties in teaching and learning mathematics have received considerable attention by educators, researchers and professional organizations throughout the world. Factors associated with learning quantitative and qualitative contents such as introductory mathematics are complicated. Review of the research literature suggests that inclusion of metacognitive strategies may increase the ability of learning and understanding the key concepts of mathematics among college students, which in turn increases the achievement and positive attitudes. The paper shows the study of various colleges in Punjab State using three different streams BA, B.Sc and B.Com. The results clearly indicate that there is significant relation of motivational Beliefs with achievement in mathematics among college students*

INTRODUCTION
National Research Council (1989) says that mathematically powerful students are quantitatively literate. They are capable of interpreting the vast amounts of quantitative data they encounter on a daily basis, and of making balanced Judgments on the basis of those interpretations. They use mathematics in practical ways, from simple applications such as using proportional reasoning for recipes or scale models, to complex budget projections, statistical analyses, and computer modeling. Eccles et al. (1983) has done a study on mathematics reasoning, numbers, sets and functions of undergraduate students and reported that there is no gender differences in expectancies for success in the then current math class, but found that male students had higher expectancies than female students for success in future math classes. Pintrich et al. (2003) says that motivated strategies for learning are an important aspect of student academic performance in the classroom, especially for the college and university students. Tella et al. (2007) investigated the impact of motivation on academic achievement in mathematics. The participants of the study were 450 secondary school students of both sexes drawn from ten schools of Ibadan. Data were collected by employing achievement test in mathematics as a measure of academic achievement. The results revealed significant differences in the academic achievement of male and female students in mathematics. Male students were found to have better achievement in mathematics. George Michael (2012) has shown that a significant majority of students in remedial mathematics do not remediate successfully. Some would argue that the instructor should directly compel students to commit themselves to the course and its work. This can be done by mandating attendance and/or by instructor student intervention. However, such tactics may be self defeating because of the way in which they may negatively affect student autonomy, which has been shown to be a positive factor in education. Kim, C et al. (2010) investigate the effects of motivation, volition and belief change strategies, implemented with personal and group email messages, on students' attitudes, study habits and achievement in a calculus course for non-mathematics majors. This article argues that student autonomy should be taken into consideration when choosing strategies through which students are motivated for achievement. Motivational beliefs components Intrinsic Goal orientation (IGO), Extrinsic Goal orientation (EGO), Task value (TV), Control beliefs (CLB), Self efficacy (SE) and Text Anxiety (TA) are taken as keywords.

OBJECTIVE OF STUDY
- To study achievement in mathematics among the college students of Punjab in relation to stream and gender.
- To study motivational beliefs among the college students of Punjab in relation to stream and gender.
- To study relationship of achievement in mathematics with motivational beliefs and to identify significant predicator.

HYPOTHESES
- There is no significant gender and stream difference of achievement in mathematics among the college students of Punjab.
- There is no significant gender and stream difference in motivational beliefs among the college students of Punjab.
- There is significant predictor of achievement in mathematics namely motivational beliefs.

RESEARCH METHOD
Descriptive survey method of research was used for the conduct of the present study.

Sample
Data was collected from 1200 male and female students in three different streams namely B.A, B.Sc, and B.Com from five districts: Ludhiana, Patiala, Jalandhar, Nawanshahr and Ropar randomly. Further three colleges from each district were selected. Each 400 students with 200 boys and 200 girls were taken from different streams for further study.

Research Tool
- Mathematics Achievement Test
- Motivational Strategies for Learning Questionnaire (MSLQ) Developed by Pintrich et al. (1991)

ANALYSIS AND INTERPRETATION OF DATA
Keeping in view the objective of study the results were interpreted under given sub headings.

Achievement in Mathematics of College Students with respect to gender
Results demonstrates that the mean values and SDs of the college students on achievement in mathematics showing male and female achievement score are 43.6, 44.8 and 10.54, 11.36 respectively. Degree of freedom came out to be 398 that resulted t-value to be 1.12 which is in significant at 0.01 levels. Hence it is interpreted that there prevails no significant difference in achievement in mathematics of college students showing male and female achievement of college students.

Achievement in Mathematics of College Students with re-

spect to Stream

Results shows that 122 (30.5%) college students lie above the class intervals in which mean (44.21) falls. 106 students with percentage (26.5%) lie in the class interval of 43 to 49 in which mean falls and 172 (43%) students find their places in the class interval of 22 to 42 that lie below the class interval in which mean falls. Skewness of the frequency distribution comes out to 0.12 means it is nearly normal distribution of scores. F-value obtained by applying ANOVA is 0.66 which is in significant at 0 .01 level of significance. It shows that there is in significant difference among the college students of three streams.

Motivational Beliefs of College Students with respect to gender

All the components of motivational belief IGO, EGO, TV, CLB, SE and TA of students differ significantly from one another. Hence, the mean scores of all the students differ significantly from one another.

Table 1
Distribution of Score of Motivational Belief along with different components

Class Int.	IGO		EGO		TV		CLB		SE		TA	
	f	p	f	p	f	p	f	p	f	p	F	p
5.8-7	493	41.0	472	39.3	386	32.2	431	35.9	472	39.3	29	2.4
4.2-5.7	399	33.3	381	31.8	376	31.3	358	29.8	360	30.0	71	5.9
3.6-4.1	174	14.5	193	16.1	226	18.8	219	18.3	212	17.6	306	25.5
2.3-3.5	107	8.9	114	9.5	162	13.5	165	13.8	147	12.3	552	46
2.2-1	27	2.3	40	3.3	50	4.2	27	2.2	9	0.8	242	20.2
Total	1200	100	1200	100	1200	100	1200	100	1200	100	1200	100

The statistical data shows that 493 students with percentage (41%) college students lie above the class intervals in which mean (5.21) falls, 472 students with percentage (39.3%) college students lie above the class intervals in which EGO mean (5.13) falls, 386 students with percentage (32.2%) college students lie above the class intervals in which TV mean (4.84) falls, 431 students with percentage (35.9%) college students lie above the class intervals in which CLB mean (4.98) falls, 472 students with percentage (39.3%) college students lie above the class intervals in which SE mean (5.13) falls, 406 students with percentage (33.84%) college students lie above the class intervals in which TA mean (3.22) falls as shown in Table 1.

Results shows the mean values and SDs of the college students on motivational belief (IGO) showing male and female score are 5.09, 5.32 and 1.39, 1.22 respectively. Degree of freedom came out to be 1198 that resulted t-value to be 3.067 which is significant at 0.01 levels. Hence it is interpreted that there prevails significant difference in motivational belief (IGO) of college students of Punjab.

Degree of freedom of other components of motivational beliefs such as EGO, TV, CLB, SE and TA came out to be 1198 that resulted t-value to be 0.380, 1.491, 3.2, .896 and .263 respectively, which is in significant at 0.01 levels, Hence it

is interpreted that there prevails no significant difference in motivational belief (EGO, TV, CLB, SE and TA) of college students of Punjab.

Motivational Beliefs of College Students with respect to Stream

It is revealed that mean score of college students in motivational belief is 5.19 with median and mode 5.0 and 7.0 respectively it shows the scores lie nearly in normal distribution whereas range of the scores came out to be 6.0. The results shows that 183 (45.75%) college students lie above the class intervals in which mean (5.19) falls. 107 students with percentage (26.75%) lie in the class interval of 4.2 to 5.7 in which mean falls and 110 (27.5%) students find their places in the class interval of 1 to 4.1 that lie below the class interval in which mean falls. Skewness of the frequency distribution comes out to -0.47 means there are many students in a group with their scores higher than the average score of the group.

F-value obtained by applying ANOVA on various components of motivational beliefs such as IGO, EGO, TV, CLB, SE and TA came out to be 0.17, 31.78, 42.01, 18.45, 2.57, 21.06 respectively which is in significant at 0.01 level of significance. It shows that there is in significant difference among the college students of three streams.

CONCLUSIONS
- Boys and Girls had similar motivational beliefs, these important similarities in boys and girls may also be caused by numerous aspects of formal schooling that are generally common across Indian societies and appear to exclude overt gender typing.
- The presence or absence of gender differences in motivation, and the direction of any such differences, are likely to be dependent on myriad of local and broad cultural circumstances. Rather than looking to determine in a definitive manner the nature of motivational difference as a function of gender, the role of research ought to be the mapping of variation between gender groups.
- The motivational beliefs components intrinsic goal orientation shows significant difference between boys and girls students. It shows intrinsic motivation is positively related to a number of desired cognitive and motivational outcomes such as students' academic performance This study therefore concluded that goal orientation had an immense influence on academic achievement of the students.
- There is significant positive relation of motivational beliefs with achievement in Mathematics. Directing students' attention to the strategy aspects of a learning task can have positive effect on students' self-efficacy and their motivation. Strategy instruction is an instructional format designed to teach procedures for thinking about math processes. When introducing a new task, teachers explain the strategies required for the task and state that they are learnable and can be used to advance mathematical achievement.

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