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Learning Strategies of Secondary School Students as Correlates of Academic Achievement and Gender

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ABSTRACT

The objectives of the study were: (i) to study the learning strategies of Secondary school students, (ii) to study gender differences in the learning strategies of secondary school students (iii) to study the relationship between learning strategies and academic achievement of secondary school students.1200 secondary school students of Punjab were administered Motivational Strategies for Learning Questionnaire (Pintrich et al, 1991) The results show that significant differences have not been found between high and low achievers as well as between male and female school students on the rehearsal, elaboration, organization, critical thinking and meta-cognitive of self-regulation of learning strategies. Even the interaction effect of gender and academic achievement was not found significant on these dimensions except the last one i.e. meta-cognitive self-regulation dimension.

Key words: Learning strategies, school students, academic achievement

Introduction

Hasanbegovic (2006) stated that "learning strategies refer to students' self-generated thoughts, feelings, and actions, which are systematically oriented toward attainment of their goals". Without making the use of good learning strategies learners often learn passively and eventually become unable to achieve their aims. These strategies not only make one an independent learner but also an active learner by teaching him how to

make use of what he or she has learned to be successful. It can also be corresponding to self-regulated learning. Learning strategies are the behaviors and thoughts expected of learners during learning and influential in their process of encoding, and facilitating their learning. They are the cognitive plans designed so as to fulfill a duty (Weinstein & Mayer, 1986).Learning strategies accessed by the Manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ) are Cognitive and Meta-cognitive strategies (Pintrich, Smith, Gracia and Mckeachie, 1991).

The cognitive and meta-cognitive strategies namely: rehearsal, elaboration, organization, critical thinking and meta-cognitive self- regulation are defined and differentiated. Rehearsal strategies include naming items from a list to be learnt, actively reading assignments according to a plan, listening in lectures and rewriting class notes (Pintrich et al, 1991). Elaboration strategies help student store information in long- term memory by building internal connections between terms to be learnt. Such strategies require student to edit notes, compare reading assignment with lecture notes, summarize, paraphrase and find their own examples from real world events and problems, as well as to use generative note- taking. Organizing strategies include clustering outlining, grouping, selecting the main idea from reading passage and paying attention to headings, subheadings, diagrams, tables, figures, charts and graphs. These strategies help students select appropriate information and also make connections with the information to be learnt. Further critical thinking refers to the degree to which student report applying previously acquired knowledge to new situation in order to solve problems, reach decisions or make critical evaluations with respect to student of excellence.

Meta-cognition consists of two components: Knowledge and regulation. Meta cognitive knowledge includes knowledge about oneself as a learner and the factors that might impact performance. Strategies and knowledge about when and why to use strategies is also required.Meta-cognitive regulation is the monitoring of one's cognition and includes planning activities, awareness of comprehension and task performance and evaluation of the efficacy of monitoring processes and strategies.

Butler et al (2008) investigated the impact of e-learner cognitive style on the productive value of student's success in online distance education course. The result revealed that cognitive learning styles influence learners online course satisfaction. Furthermore, certain students demographic, characteristic effect online course satisfaction. Successful experience in an online learning environment increase student's achievement.

Al Khatib (2010) examined the predictive association between meta-cognitive self regulation learning, motivational beliefs and United Arab Emirates (UAE) college student's academic performance. It was revealed that four of the independent variables (intrinsic goal orientation, self-efficacy, test anxiety, and meta-cognitive self-regulated learning) were found to be significant predictors of college students' performance.

Simsek and Balaban (2010) examined learning strategies of successful and unsuccessful university students. Results showed that successful students used more varied, and better learning strategies than unsuccessful students. Female students were more effective in selecting and using, appropriate strategies than male students.

Radovan (2011) examined the relation between distance students' motivation, their use of learning strategies, and academic success. The results show the importance of motivational factors, such as intrinsic goal orientation, task value and self-efficacy on the one hand, and effort regulation strategies on the other.

Kahraman and Sungur (2011) examined the contribution of motivational beliefs to students' meta-cognitive strategy use.. Results showed that the elementary students who feel self-efficacious in science and study for the reasons of learning and understanding (mastery approach goals) the course material tend to use meta-cognitive strategies at higher levels.

The objectives of the study were: (i) to study the learning strategies of Secondary school students, (ii) to study gender differences in the learning strategies of secondary

school students (iii) to study the relationship between learning strategies and academic achievement of secondary school students. The hypotheses framed for this study were: (i) there are no significant differences in the learning strategies of secondary' school students on the basis of gender, (ii) there is no significant relationship between learning strategies and academic achievement of secondary school student

Method and Procedure

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

SAMPLE

Secondary school students of Punjab affiliated with PSEB pursuing three streams (arts, science, and commerce) of study were the universe of the study. A sample of nearly 1200 secondary school students, from randomly selected 40 schools each were selected by giving due weight age to different streams and gender. Only those courses have been included which have matriculation examination as basic qualification.

Research Tools

- Motivational Strategies for Learning Questionnaire (Pintrich, et al. (1991), had been employed to assess five cognitive and meta-cognitive learning strategies (rehearsal, elaboration, organization, critical thinking, meta-cognitive. self-regulation) and six motivational belief components (intrinsic goal orientation, extrinsic goal orientation, task value, control of learning, self-efficacy for learning and performance, test anxiety) of Secondary School students.
- Academic achievement was taken as percentage of marks of their matriculation.

Results and Discussion

In order to study learning strategies in relation to academic achievement of secondary school students showing across gender , ex-post facto factorial design was formulated as academic achievement x Gender (2x2 Factorial Design).

The distribution of academic achievement of secondary school students were used for identifying low and high achievers by Q_1 and Q_3 criteria (Q_1=58.13 ; Q_3=74.58) The secondary school students scoring below 58 were treated as low achievers and those scoring above 73 were treated as high achiever secondary school students. The secondary school students having academic achievement scores in the range of 58 to 73 falling in average were not considered in this research design. In the high achieving group of 260 students, there were 89 males and 171 females. In the low achieving group, males were 149 and 84 are females out of 233 students.

Learning Strategies In Relation To Academic Achievement and Gender Among Secondary School Students

I. Rehearsal: - The means and SDs scores of rehearsal dimension of learning strategies in relation to achievement x gender of secondary school students are given in Table 1.

Table 1.

Means and SDs of Rehearsal Dimension of Learning Strategies Among (Academic Achievement x Gender Factorial Design) Secondary School Students

Achievement		Gender		
		Female	Male	Total
High Achiever	N	171	89	260
	Mean	18.83	18.00	18.54
	SD	5.11	5.85	5.39
Low Achiever	N	84	149	233
	Mean	18.71	18.63	18.66

	SD	5.14	4.64	4.83
Total	N	255	238	493
	Mean	18.79	18.39	18.60
	SD	5.12	5.136	5.133

This table indicates that the total mean score of rehearsal Dimension of learning strategies of the female secondary school students (M= 18.79) is higher than the male secondary school students (M= 18.39). Moreover, it is indicated from Table that rehearsal score of high achiever secondary school students (M= 18.54) have comparatively lower rehearsal score than low achiever secondary school students (M= 18.66). The mean scores of all groups within academic achievement and gender factorial design in rehearsal dimension of learning strategies lies between 18.00 and 18.83.

In order to study the main effect of academic achievement and gender on all dimensions of learning strategies of the secondary school students along with their interaction effect, statistical technique of two way ANOVA (2x2 factorial design involving two types of gender i.e. female and male, achievement levels (high achievers and low achievers) was applied on scores of all dimensions of learning strategies. The summary of ANOVA for rehearsal dimension is given in table 2.

Table 2

Summary of Analysis of Variance of Rehearsal Dimension of Learning Strategies among Secondary School Students (Academic Achievement x Gender)

Source of Variance	df	Sum of Squares	Mean Sum of Squares	F-value
Academic Achievement (A)	1	1.74	1.74	0.06
Gender (B)	1	19.01	19.01	0.72
A x B	1	21.67	21.67	0.82
Within	489	12947.65	26.48	
Total	492	12990.08		

Note: None of the F-value is significant.

(i) Main Effects

1. Academic Achievement:-This table indicates that the F-value for main effect of the academic achievement on rehearsal dimension of learning strategies came out to be 0.06, which is not significant at 0.05 level. This shows that high achiever and low achiever secondary school students did not differ significantly on rehearsal dimension of learning strategies (M=18.54; & 18.66).

2. Gender:-Table 2 shows that F-value for the main effect of gender rehearsal dimension of learning strategies turned out to be 0.72 which is not significant at 0.05 level. This shows that female and male secondary school student did not differ significantly in the rehearsal dimension of learning strategies (M=18.79; & 18.39).

3. Interaction Effect of Achievement x Gender:- It may be observed from Table 2 that F-value for interaction effect of academic achievement and gender on rehearsal dimension of learning strategies turned out to be 0.82, which is not significant at 0.05 level. This shows non significant joint effect of academic achievement and gender are independent of each other to explain rehearsal dimension of learning strategies among secondary school students It means that there was no effect of gender and academic achievement on this dimension.

II Elaboration: - The means and SDs score of elaboration Dimension of learning strategies in relation to academic achievement x gender of secondary school students are given in table 3.

Table 3

Mean and SDs of Elaboration Dimension of Learning Strategies among (Academic Achievement x Gender Factorial Design) Secondary School Students

Achievement		Gender		
		Female	Male	Total
High Achiever	N	171	89	260

	Mean	27.66	27.62	27.65
	SD	7.41	8.8	7.92
Low Achiever	N	84	149	233
	Mean	27.01	27.59	27.38
	SD	7.75	6.55	7.02
Total	N	255	238	493
	Mean	27.45	27.60	27.52
	SD	7.54	7.48	7.511

This table indicates that the mean scores of elaboration dimension of learning strategies of the female secondary school students (M= 27.45) is lower than the male secondary school students (M= 27.60). Moreover, it is indicated from Table that elaboration score of high achiever secondary school students (M= 27.65) have comparatively higher elaboration score than low achiever secondary school students (M= 27.38). The summary of ANOVA is given in table 4.

Table 4

Summary of Analysis of Variance of Elaboration Dimension of Learning Strategies among Secondary School Students (Academic Achievement x Gender)

Source of Variance	df	Sum of Squares	Mean Sum of Squares	F-value
Academic Achievement (A)	1	8.83	8.83	0.16
Gender (B)	1	3.07	3.07	0.05
A x B	1	14.98	14.98	0.26
Within	489	27774.11	56.80	
Total	492	27800.98		

Note: None of the F-value is significant.

(i) Main Effects

1. Academic Achievement:-This table indicates that the F-value for main effect of the academic achievement on elaboration dimension of learning strategies came out to be

0.16, which is not significant at 0.05 level. This shows that high achiever and low achiever secondary school students did not differ significantly on elaboration dimension of learning strategies (M=27.65; & 27.38).

2. Gender:-Table 4 shows that F-value for the main effect of gender on elaboration dimension of learning strategies turned out to be 0.05 which is not significant at 0.05 level. This shows that female and male secondary school students did not differ significantly in the elaboration dimension of learning strategies (M=27.45; & 27.60).

3. Interaction Effects of Academic Achievement x Gender:- It may be observed from table 4 that F-value for interaction effect of academic achievement and gender on elaboration dimension of learning strategies turned out to be 0.26, which is not significant at 0.05 level. This shows non significant joint effect of academic achievement and gender are independent of each other to explain elaboration dimension of learning strategies among secondary school students It means that gender and academic achievement did not have effect on this dimension.

III. Organization:- The means and SDs scores of organization dimension of learning strategies in relation to academic achievement x gender of secondary school students are given in Table 5.

Table 5

Means and SDs of Organization Dimension of Learning Strategies Among (Academic Achievement x Gender Factorial Design) Secondary School Students

Achievement		Gender		
		Female	Male	Total
High Achiever	N	171	89	260
	Mean	18.24	17.96	18.15
	SD	5.33	5.75	5.481
Low Achiever	N	84	149	233
	Mean	17.95	18.2	18.12

	SD	5.16	4.59	4.813
Total	N	255	238	493
	Mean	18.14	18.12	18.13
	SD	5.28	5.06	5.17

This table 5 indicates that the total mean score of organization dimension of learning strategies of the female secondary school students (M= 18.14) is little higher than the male secondary school students (M= 18.12). Moreover, it is indicated from Table that organization score of high achiever secondary school students (M= 18.15) have comparatively little more organization score than low achiever secondary school students (M= 18.12). The summary of ANOVA is given in table 6.

Table 6

Summary of Analysis of Variance of Organization Dimension of Learning Strategies among Secondary School Students (Academic Achievement x Gender)

Source of Variance	Df	Sum of Squares	Mean Sum of Squares	F-value
Academic Achievement (A)	1	0.11	0.11	0.00
Gender (B)	1	0.09	0.09	0.00
A x B	1	7.80	7.80	0.29
Within	489	13200.43	26.99	
Total	492	13208.43		

Note: None of the F-value is significant

(i) Main Effects

1. Academic Achievement:-This table indicates that the F-value for the main effect of academic achievement on organization dimension of learning strategies came out to be 0.00, which is not significant at 0.05 level. This shows that high achiever and low achiever secondary school students did not differ significantly on organization dimension of learning strategies (M=18.15; & 18.12).

2. Gender:-Table 6 shows that F-value for the main effect of gender on organization dimension of learning strategies turned out to be 0.00 which is not significant which is not significant at 0.05 level. This shows that female and male secondary school student did not differ significantly in the organization dimension of learning strategies (M=18.15; &18.12).

3. Interaction Effects of Academic Achievement x Gender:- It may be observed from table 6 that F-value for interaction effect of academic achievement and gender on organization dimension of learning strategies turned out to be 0.29, which is not significant at 0.05 level. This shows that non significant joint effect of academic achievement and gender are independent of each other to explain organization dimension of learning strategies among secondary school students. It means that academic achievement and gender did not any effect on this Dimension.

IV Critical Thinking: - The means and SDs scores of critical thinking Dimension of learning strategies in relation to achievement x gender of secondary school students are given in table 7.

Table 7

Means and SDs of Critical Thinking Dimension of Learning Strategies Among (Academic Achievement x Gender Factorial Design) Secondary School Students

Achievement		Gender		
		Female	Male	Total
High Achiever	N	171	89	260
	Mean	23.35	22.89	23.19
	SD	6.12	7.04	6.46
Low Achiever	N	84	149	233
	Mean	22.21	22.65	22.49
	SD	6.19	5.64	5.85
Total	N	255	238	493

	Mean	22.97	22.74	22.86
	SD	6.17	6.21	6.19

This table indicates that the total mean scores of critical thinking dimension of learning strategies of the female secondary school students (M= 22.97) is little higher than the male secondary school students (M= 22.74). Moreover, it is indicated from Table7 that critical thinking score of high achiever secondary school students (M= 23.19) have comparatively higher critical thinking mean score than low achiever secondary school students (M= 22.49). The mean scores of academic achievement and gender factorial design in critical thinking dimension of learning strategies lies between 22.21 to 23.35.The summary of ANOVA is given in table 8.

Table 8

Summary of Analysis of Variance of Critical Thinking Dimension of Learning Strategies among Secondary School Students (Academic Achievement x Gender)

Source of Variance	Df	Sum of Squares	Mean Sum of Squares	F-value
Academic Achievement (A)	1	60.66	60.66	1.58
Gender (B)	1	6.67	6.67	0.17
A x B	1	15.53	15.53	0.40
Within	489	18821.03	38.49	
Total	492	18903.89		

Note: None of the F-value is significant

(i) Main Effects

1. Academic Achievement: - This table indicates that the F-value for the main effect of academic achievement on critical thinking dimension of learning strategies came out to be 1.58, which is not significant. This shows that high achiever and low achiever secondary school students did not differ significantly on critical thinking dimension of learning strategies (M=23.19; &22.49).

2. Gender: - Table 8 shows that F-value for the main effect of gender on critical thinking dimension of learning strategies turned out to be 0.17 which is not significant at 0.05 level. This shows that female and male secondary school student did not differ significantly in the critical thinking dimension of learning strategies (M=22.97; & 22.74).

3. Interaction Effects of Academic Achievement x Stream:-It may be observed from Table 8 that F-value for interaction effect of academic achievement and gender on critical thinking dimension of learning strategies turned out to be 0.40, which is not significant at 0.05 level. This shows that non-significant joint effect of academic achievement and gender are independent of each other to explain critical thinking dimension of learning strategies among secondary school students. It means that academic achievement and gender did not have any effect on this dimension.

V. Self Regulation:-The means and SDs scores of self regulation dimension of learning strategies in relation to academic achievement x gender of secondary school students are given in Table 9.

Table 9

Means and SDs of Meta-cognitive of Self-Regulation of Learning Strategies Among (Academic Achievement x Gender Factorial Design) Secondary School Students

Achievement		Gender		
		Female	Male	Total
High Achiever	N	171	89	260
	Mean	54.55	53.27	54.11
	SD	14.36	16.95	15.31
Low Achiever	N	84	149	233
	Mean	52.77	52.46	52.57
	SD	13.71	11.75	12.49
Total	N	255	238	493
	Mean	53.96	52.76	53.38

	SD	14.18	13.93	14.07

This table indicates that the total mean score of self regulation dimension of learning strategies of the female secondary school students (M= 53.96) is higher than the male secondary school students (M= 52.76). Moreover, it is indicated from Table that self regulation score of high achiever secondary school students (M= 54.11) have comparatively higher self regulation score than low achiever secondary school students (M= 52.57). The main scores of all groups within academic achievement and gender factorial design lies within 52.48 to 54.55. The summary of ANOVA is given in table 10.

Table 10

Summary of Analysis of Variance of Meta-cognitive Self-Regulation Dimension of Learning Strategies among Secondary School Students (Academic Achievement x Gender)

Source of Variance	Df	Sum of Squares	Mean Sum of Squares	F-value
Academic Achievement (A)	1	177.26	177.26	0.89
Gender (B)	1	291.42	291.42	1.47
A x B	1	764.12	764.12	3.86*
Within	489	96802.44	197.96	
Total	492	98035.24		

* Significant at 0.05 level

(i) Main Effects

1. Academic Achievement:-This table indicates that the F-value for the academic achievement on self regulation dimension of learning strategies came out to be 0.89, which is not significant. This shows that high achiever and low achiever secondary school students did not differ significantly on self regulation dimension of learning strategies (M=54.11:& 52.57).

` **2. Gender:-**Table 10 shows that F-value for the main effect on self regulation dimension of learning strategies of gender turned out to be 1.47 which is not significant. This shows that female and male secondary school students did not differ significantly in the self regulation dimension of learning strategies (M=53.96:&52.76).

3. Interaction Effect of Academic Achievement x Gender:- It may be observed from table 10 that F-value for interaction effect of academic achievement and gender on self regulation dimension of learning strategies turned out to be 3.86, which is significant at 0.05 level. This shows significant joint effect of academic achievement and gender are independent to explain self regulation dimension of learning strategies among secondary school students. It shows the joint effect of gender and academic achievement on this dimension.

Conclusions

From the results of the present study, the following conclusions can be drawn at

(1) There were no significant differences on the Rehearsal dimension of learning strategies among secondary school students on the basis of academic achievement as well as gender. Similarly there was no interaction effect of gender and achievement on this dimension. The mean scores ranged between 18.00 to 18.83 among different groups of students.

(2) No significant differences were found on elaboration dimension of learning strategies between high and low achievers as well as male and female secondary school students. The interaction effect of gender and achievement was also not found on this dimension. The mean scores ranged between 27.01 to 27.66.

(3) Significant differences did not exist on organization dimension of learning strategies between male and female school students as well as high and low achievers. No interaction effect of gender and achievement was found. The range of mean scores was between 17.95 to 18.24.

(4) The significant differences on the mean scores of critical thinking dimension of learning strategies were not found between high achievers and low achievers as well as male and female school students. No interaction effect of gender and achievement was observed on this dimension. The mean scores ranged between 22.21 and 23.35.

(5) No significant difference was seen on the self-regulation dimension of learning strategies between high and low achievers as well as male and female school students. But interaction effect on gender and achievement was significant on this dimension. The mean scores ranged between 52.46 to 54.55.

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