



RESEARCH ARTICLE

Association of Learning Styles with Exam Anxiety of Students at Secondary Level

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Abstract

The study investigated learning styles, and test anxiety as predictors of academic success among secondary school students. A descriptive design is employed to determine the learning style and test anxiety of students at secondary level. The Honey and Mumford learning style questionnaire and test anxiety inventory will be used to assess the predictors of success among the students (learning styles, and test anxiety). Cluster sampling technique was used to select 150 male and 150 female students from seven boys and five girls high schools who participated in initial survey of this research study. Pearson's Product Moment Correlation and Multiple regression analysis was used to analyze the data.

Keywords: Learning Styles, Test Anxiety, Learning success

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1 | INTRODUCTION

Educationists and researchers since ages have tried and been trying to explore the diverse ways of people's learning plus retaining information. Learning styles might be defined as specific cognitive pattern based on individual difference that may assist an individual to perform any function consistently (1, 2). An individual responds to the environment in which he lives, three domains namely psychomotor, cognitive in addition to effective domain play a vital role in determining an individual's perception about his nature in addition to nurture (3). Thus these three domains may be

referred as distinctive behavior patterns serving as indicators of how anyone learns, adapts as well as adapts to his environment according to his needs. Learners' needs comprise of diverse learning styles which may persuade their way of getting through the examination. (4–7).

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In addition to studies that explain learning styles and their discovery along with their uses, many researchers tried to investigate the association between different learning styles to many variables such as academic performance, students' study habit and examination anxiety. According to (8). Many research findings on learning styles indicated that learning can be improved by considering personal characteristics of students for designing plus delivering instruction in class room. (9). Many students consider it easy to focus on theories rather than mathematical models while some learners use visual information including pictures, diagram, and simulation to understand better, while others can get more from oral and written information. Researchers argued that learning style also work as a useful indicator for potential learning performance (10). In this context, (11) stated that students with different learning styles have distinct preferences during different instructional activities. Thus, various models have been proposed by theoreticians and used by educators in order to measure learning styles of students.

(12) provided an extensive report which involved at least 71 learning style models. The models have some components different from each other related to the extent that they may change over time for learners. Some popular instruments were various extensions of Jung's (1970) psychological types and Gardner's (1993) multiple intelligences. One of the widely used models in this area was developed by Gregorc and Butler (1984) which have four combinations of perceptual qualities and ordering abilities: concrete sequential, abstract random, abstract sequential, and concrete random. In this model it is considered that each individual can be strong in one or two of the four styles. In contrast to Gregorc (1984), Felder and Silverman (1988) did not consider learning styles to be consistent. According to them, learning preferences may change with the time and situation. (1) VARK inventory, which includes visual, oral, read-write, and kinesthetic perceptual styles, in addition to the specific inventory of Felder and Solomon (1997), which measures learning preferences across four bipolar preferences, active-reflective, sensing-intuitive, visual-verbal, and sequential-global.

Examination is a part of school system. According to Lowe et al. (2008), Examination is conducted to assess students' progress in addition to make decisions about an individual's position in institutions(also see Zeidner, 1998) and test anxiety is a noteworthy educational problem associated with examination system .Different situations such as feeling tense, aggressiveness appeared while attempting examination. In simple words many students suffer examination phobia. Research studies related test anxiety to academic performance has established that high levels of test anxiety are associated with lower levels of students' learning and performance (Sub &Prabha, 2003; Lowe et al., 2008,also see Metallidou &Vlachou, 2007).

A student with high level of exam anxiety will not be able to attempt his examination properly, resulting low grades in examination. The most significant and helpful way that may assist students in achieving high scores in examination is to teach them according to their learning styles so that it may reduce level of exam anxiety

2 | METHODOLOGY

2.1 | Research objectives

Following are the Objectives of the Study

To find out Learning Styles of secondary level students. To know about the exam anxiety of students at secondary level

3. To find out relationship between learning styles and exam anxiety of students at secondary level.

2.2 | Hypotheses

The following hypotheses were formulated for present study:

Ho1. There exist no significant difference between Learning Styles of males and female students at secondary level.

Ho2. There exist no significant difference between exam anxiety of male and female students at secondary level.

Ho3. There exist no significant relationship between learning styles and exam anxiety of male and female students at secondary level.

Researchers are trying to sort out the ways learning styles can best be used in teaching learning process. There are different school of thoughts about learning styles and their use in the class room.

2.3 | Participants

Data were collected from secondary level students enrolled in 10th grade studying in public sector schools of tehsile isa khel, in district Mianwali, province Punjab, Pakistan. Cluster sampling technique was used to obtain potential participants from population. The learning styles questionnaire and exam anxiety scale was distributed among 300 students, 284 students participated and responded their responses. During data cleaning process 3 observations were removed. A total of 300 samples were used in this study including 160 female (53%) and 140 male (47%) participants.

2.4 | Instruments

To answer the research questions, data was gathered by using two instruments were used to collect research data and these were: 1) Westside Test Anxiety Scale (www.amtaa.org) consisting of 10 items to measure test anxiety; 2) The Honey and Mumford learning styles questionnaire (1986) with four subscales (activist, reflectors, theorists, pragmatists) consisting of 40 items was used.

Westside Test Anxiety Scale Test plus Honey and Mumford learning styles questionnaire (1986) were taken from open education resource. It was not compulsory to take permission from researcher due to free access availability. Each statement indicated a preference for a particular learning style by using the following ordinal scale: (1) Disagree strongly; (2) Disagree; (3) Neutral; (4) agree; (5) Agree strongly. The reliability of the questionnaires was determined through pilot testing on 30 students of class 10th. As these students go through examination attempting process in their 9th grade. So there was a chance that they might be able to perform better in Westside Test

Anxiety Scale Test. Alpha Coefficients value ranged from .70 for exam anxiety and .72 for learning styles scales items.

3 | DATA ANALYSIS

A range of statistical procedures were used to measure the reliability and validity of the instrument and to answer research questions. These techniques included descriptive statistics, reliability analysis, regression analysis and Pearson product moment correlation coefficient was used to identify the association, (+1 to -1), in order to determine a more accurate prediction (Munro, 2005). The data was analyzed using IBM SPSS statistics software. Statistical significance level was set at $p < .05$ for all omnibus statistical tests to analyze the data.

3.1 | Activist

This subscale items refer as an active approach toward learning. This subscale contains ten items. The reliability coefficient of Activist learning style subscale was 0.82.

3.2 | Reflectors

This subscale contains ten items. These items measure reflective approach of an individual toward learning. The internal consistency reliability was 0.83.

3.3 | Theorists

There are ten items in this subscale. These items describe set values that lead to task and goal-directed learning. The internal consistency reliability of Consciousness subscale was 0.84.

3.4 | Pragmatists

There are also ten items in pragmatist subscale. These items reflect practical approach of an individual toward learning. The internal consistency reliability of this subscale was .84.

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The averages of all items of corresponding subscales of learning styles were used for data analysis. The higher mean value of each subscale indicates a higher level of agreement.

A linear regression analysis was used to determine predictable nature of different learning styles for exam anxiety. Table 1

Table 1 Descriptive statistics for the scores on learning styles for male and female is reported in table 1. According to Table 1, both male and female students tend to have highest mean score on activist learning scale. Highest mean value of (M=3.67) for male and (M=3.40) for female regarding Activist learning style represent that it exists more commonly among respondents with a bit variation in mean score value for both gender But it exist commonly in both genders at secondary level.

Table 2 shows that mean value of (M=3.67, M=3.40) for male and female students indicated that though both male and female respondents at secondary level scored high for activist learning styles but Mean score (3.66) on exam anxiety scale is higher for male than female students. Thus the null hypothesis that there exist no significant difference between learning styles and exam anxiety of male and female students at secondary level is rejected.

Table 3 shows that in survey of N=284 of male, N=139 and female=145, students there exist no significant relationship between exam anxiety, activist and reflectors learning style. A positive significant correlation for theorists and significant negative correlation between pragmatist learning styles and exam anxiety.

It was found that for activist learning style of males (N=139, M=3.70, S.D=0.86) and females (N=145, M=3.40, S.D=0.99). A Pearson's "r".023 shows a non-significant positive correlation at $p > 0.01$. For reflectors learning style of males (N=139, M=3.21, S.D=0.67) and females (N=145, M=2.98, S.D=0.74) the value of Pearson's "r".014 shows a non-significant correlation at $p > 0.01$. While for males (N=139, M=3.20, S.D=0.78) and females (N=145, M=3.40, S.D=1.00), The value of "r".0104 for theorist learning style and exam anxiety, a significant positive correlation at $p > 0.01$ exists. On the other hand, for pragmatist learning style

and exam anxiety, there exist a strong negative significant correlation as value of correlation coefficient "r".01 shows a significant negative correlation at $p < 0.01$ for males (N=139, M=3.44, S.D=0.83) and females (N=145, M=2.93, S.D=0.78).

So null hypothesis that there exist no significant relationship between learning styles and exam anxiety accepted for activist and reflectors learning style and rejected for theorists and pragmatist learning styles and exam anxiety. Table 4

Table 5 shows that an independent t-test was conducted to determine if there exist any difference between exam anxiety and learning styles of students at secondary level or not. There is no statistically significant difference found between Activist learning style of male (N=145, M=3.67, SD=0.85) and female students (N=145, M=3.40, SD=0.99), $t(282) = -2.42, p = 0.016$. The effect size $n > 0.02$ was small and the 95% confidence interval was 0.50 to 0.48

Similarly, no statistically significant difference between exam anxiety and Theorist learning style of male (N=145, M=3.2, SD=0.78) and female students (N=145, M=3.4, SD=1.00), $t(282) = -1.77, p = 0.078$. The effect size $n > 0.05$ was found medium and the 95% confidence interval was -0.399 to .021

On the other hand, Statistically significant difference was found between Reflector learning style of male (N=145, M=3.21, SD=0.78) and female students (N=145, M=3.4, SD=1.00), $t(282) = -1.77, p = 0.078$. The effect size $n > 0.05$ was found medium and the 95% confidence interval was -0.399 to .021 and a statistically significant difference was found between pragmatist learning style and exam anxiety of male (N=139, M=3.44, SD=0.83) and female (N=145, M=2.9, SD=0.77) and $t(282) = 5.37, p = 0.00$. The effect size $n > 0.07$ found medium, The 95% confidence interval was 0.33 to 0.70.

Thus the null hypothesis that there exist no significant difference between male and female students learning styles and exam anxiety at secondary level accepted for activist and theorist learning styles and rejected for reflectors and pragmatist learning styles and exam anxiety of students at secondary level.

TABLE 1: Descriptive Statistics of the Scores on Honeyand Mumford Learning styles questionnaire and Exam anxiety for Male and Female Students (N=384)

Gender	N	Activist		Reflectors		Theorists		Pragmatists		Exam anxiety	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Male	139	3.8	0.85	3.21	0.67	3.19	0.78	3.44	0.83	3.66	0.51
Female	145	3.4	0.99	2.98	0.74	3.38	1	2.92	0.77	3.63	0.67

TABLE 2:

Gender	N	Activist		Exam anxiety	
		Mean	SD	Mean	SD
Male	139	3.8	0.86	3.66	0.51
Female	145	3.4	0.99	3.63	0.68

TABLE 3: Correlation Matrix of Learning styles and Exam anxiety (N = 284)

Exam	Activist	Reflectors	Theorists	Pragmatists	
Exam	1				
Activist	.023	1			
Reflectors	.107	.287**	1		
Theorists	.014	-.444**	-.019	1	
Pragmatists	-.010	-.220**	.085	.099	1

The level of significance in above table indicates that the combinations of variables were unable to significantly predict variance in the dependent variable

3.5 | Interpretation of linear regressions

Multiple regression procedure was used to predict exam anxiety on basis of different learning styles. Exam anxiety was regressed on following Learning styles: such as Activists, Reflectors, Theorists, and Pragmatists. These predictors accounted for -0.02% total variance in Exam anxiety, which was non-significant, $F(4,279) = 0.860, p > .001$. The stan-

dardized β coefficients were used to test the significance of each predictor. Activists, Reflectors, Theorists, and Pragmatists predictors demonstrated non-significant effect on exam anxiety of students at ($\beta = -.006, p > 0.001$), ($\beta = .111, p > 0.001$), ($\beta = -.016, p < 0.001$), and ($\beta = -.023, p > 0.001$) respectively. The linear regression equation to predict Exam anxiety through four learning styles is given using unstandardized regression coefficients as,

TABLE 4:

	Gender	N	Mean	Std. Deviation
Exam	Male	139	3.6619	.67753
	Female	145	3.6372	.50839
Activist	Male	139	3.6705	.85706
	Female	145	3.4041	.99253
Reflector	Male	139	3.2137	.67472
	Female	145	2.9800	.74130
Theorist	Male	139	3.1950	.78078
	Female	145	3.3841	1.00192
Pragmatist	Male	139	3.4432	.83441
	Female	145	2.9297	.77631

4 | CONCLUSIONS AND DISCUSSIONS

Findings from this study revealed that no significant relationship for activist and reflector learning styles and exam was found. Positive relationship between exam anxiety and theorist learning styles while negative significant relationship for pragmatist learning styles and exam anxiety was partially supported by previous literature on both correlation and experimental research studies

An interesting and unexpected result was related to exam anxiety level of male and female students at secondary level. In this regard the study results differ from the study of munaza ambreen & afrozjan. (2015) conducted on personality traits and academic achievement of secondary level students, where girls were found to be more conscious toward their success as compared to their secondary level male fellows. One reason, behind this might be that the though girls are more conscious toward their success but Activist learning styles are found more prominent in boys than the girls, that make them more anxious toward examination.

The positive correlation of theorist learning styles and exam anxiety for this research findings include association, caution, regulation, objective setting and high level of attentiveness possessed by students (13).

The significant negative correlation between exam anxiety and pragmatist learning styles has usually been explained in terms of fact that although such

individuals put everything into practice, so they learn best in situation where they are involved in doing practical work.so, Exam tension is linked with situation where the pragmatists are not given any practical work.(Funder ,2001.)

Finding exposed positive correlation between Theorist learning style and exam anxiety, it explains that learners’ theorists are logical in addition to rational besides objective. They possess quality of asking probing questions as well as they are well-organized in their methodology. However, they have low tolerance for uncertainty, disorder and ambiguity and are not good at critical thinking. They do not like anything subjective or intuitive (Marian Wool house&Trixi Blaire,2003)

Looking at the checklist items of these learning styles, it may be suggested that the nature of individuals may have any association for a learners’ study habits. It is in accordance with Thorndike law of readiness.

All learning styles (Activist, reflectors, theorists, pragmatists) were found to be non-predictors of exam anxiety. Looking at the checklist items of these learning styles (see Honey and Mumford, 1986) Activist are thought to besocial, responsible and outgoing persons. The responsible aspect of this learning style makes it a non-predictor of exam anxiety.

Thus Reflectors individuals may be careful and thoughtful; they may be active listeners and reflect on their day to day class room activities that may

TABLE 5: Levene's Test for Equality of Variances, t-test for Equality of Means

	F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
								lower	Upper
ex:	Equal variances assumed	.000	.347	282	.724	.025	.07089	-.1149	.164
	Equal variances not assumed								
ac:	Equal variances assumed	.192	2.416	282	.016	.267	.11024	.0494	.483
	Equal variances not assumed								
Re	Equal variances assumed	.372	2.774	282	.001	.234	.08422	.0679	.399
	Equal variances not assumed								
Th	Equal variances assumed	.000	-1.770	282	.078	-.190	.10689	-.3995	.0212
	Equal variances not assumed								
Pr:	Equal variances assumed	.238	5.372	282	.000	.514	.09559	.3254	.701
	Equal variances not assumed								

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TABLE 6: Regression Analysis

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.11	.012	-0.002	0.59

TABLE 7:

ANOVAa

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.226	4	.307	.860	.488b
	Residual	99.384	279	.356		
	Total	100.610	283			

TABLE 8:

Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.	Lower Bound	Upper Bound
1	(Constant)		3.910	0.000	10.000	10.000
	a	-.001	-.930	.356	-.002	.001
	Residual		0.051	1.701		
	Total		0.001	.812		
	Pragnata		0.044	.716		
			.016	.02364		

a. Dependent Variable: exam

make it not predictor of test anxiety. Theorist learning style is linked with learning discipline. Likewise pragmatists focus on application of learnt knowledge into practical situation. This may explain why the non-predictive effect of exam anxiety by theorist and pragmatist learning style increases in the linear regression. Finally, the regression performed in the present study represents those learning styles as measured by the Honey and Mumford learning styles (1986) (14) inventory can be very helpful in the determining the prediction and non-prediction of Exam anxiety at secondary level. These four predictors accounted for -0.02% of total variance in Exam anxiety which was non-significant. These results may therefore re-open the debate about whether Honey and Mumford learning styles are to be preferred to enhance the prediction of human performance and to reduce exam anxiety (primarily in educational settings)

The present study is taken for finding the Association of learning styles and exam anxiety of secondary school learners. This research study will reveal facts, how different learning styles can be used to reduce exam anxiety for various subjects. It will be helpful for educators to bring variety in their pedagogy, thus making their teaching learning process more effective. The study will assist the students of different learning styles to cope with new challenges by using their learning styles in more productive way.

The study is advantageous for future researchers for seeking guidance to their great concern. The administrators/principals would also be benefited by the study, to have a better understanding of how different learning styles can be used to enhance academic progress of their students and are valuable in exam anxiety reduction, thus affecting their institutional reputation. The study will also enable the instructors to easily understand the nature of pupil according to their learning styles as well as in diagnosing the problems of the learners in their studies of different subjects.

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