THE IMPACT OF PERCEPTUAL LEARNING STYLES ON ACADEMIC PERFORMANCE OF MASTERS' LEVEL EDUCATION STUDENTS

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ABSTRACT: *The person who is able to adopt an effective style of learning readily copes with the central task and meaningful activities. Individuals can expect better results from investment in learning and education, more knowledge acquired in less time and certainly will enjoy the learning process more than those who goes about it aimlessly. The aim of present study is to investigate the relationship between learning styles of students and their academic achievement at the university level. The students pursuing their Master degree in Education from three public sector universities of the southern Punjab were selected as a sample. David Kolb's learning style inventory was used as a guideline for designing the instrument to identify the different learning styles (i.e., Assimilating, Converging, Diverging and Accommodating) practiced by the students. Academic performance was measured by the grades points of the students. The empirical analysis found a significant positive relationship between all learning styles adopted by the students and their academic achievement except the diverging learning style. In addition, the Education students with dominated converging and assimilating learning styles performed better in terms of academic achievement. Moreover, gender was found to be a significant factor in explaining the academic performance of the students and the sampled female students perform significantly better as compared to the sampled male students. The study finding can be helpful to the students of social sciences at large in selecting an appropriate learning style that can optimize their scholastic achievement.*

Keywords: Learning Styles, Academic achievement, Assimilating, Converging, Gender, Higher Education.

INTRODUCTION

Learning has been variously described in the literature. Battersby and Gordon described learning as "a transformation that occurs in the brain mainly for problem-solving" [1]. It is an internal process that leads to behavioral change. Learning can also be elaborated as an extension and clarification of meanings of one's experience. It is an organized, internal process of testing ideas relevant to the problems. Learning goes on throughout life as it is a personal and natural process. Becoming a lifelong learner is to become more alive, more open to new experiences, ideas, and insights.

Learning styles define people's characteristics and their ways of information processing, feeling, and behaving toward learning situations. In other words, learning styles refer to those preferences, dispositions, and tendencies that influence one's learning [2]. Knowledge of learning styles is termed useful in becoming an effective learner and educator. Students are unique in their ways to have a tendency in adopting different styles of learning for the acquisition and assimilation of knowledge. It has been indicated that both low and average achievers earn higher scores on standardized achievement and aptitude tests when they are taught within the realm of their learning [3]. Many studies have demonstrated significant academic gains of adopting the preferred learning approach. In one study, the undergraduate physical therapy students who were forced to learn in their least preferred ways experienced higher anxiety levels and more negative attitude towards the instructions than a comparable group that learned in their most preferred ways [4]. In the way of learning, every student's adopted learning style is the reflection of their individual differences. Hayes, Marshall and Turner described that individual differences have a very significant role in the academic achievements of students. With the benefit of hindsight, often it is obvious that part of the problem is usually the tendency to apply a single approach to all students. Student learning style challenges this premise and argues for an eclectic instructional program, one based upon a variety of techniques and structures in order to reflect the different ways that individual students acquire knowledge and skills [5].

Student's learning approaches can have a significant impact on their grade achievement. There are two main directions to the learning process in which the students follow these two ways to learn, the first way to learn is the acquisition of new information and the second is the information processing after it is acquired [6]. David Kolb combined these directions to shape learning process that determines an individual's own style of learning. The Kolb's model is one of the theoretical frameworks used to determine the different learning styles. This model is widely used in the field of Educational Psychology and the learning style. Styles identified by him include assimilating, converging, diverging, and accommodating learning styles. He postulates that the assimilators obtain their learning by thinking and watching. Converging learning style adopters learn by thinking and doing. However, people opting for diverging style learn by feeling and watching while accommodators learn through feeling and doing [7].

It is imperative for the university graduates to achieve higher academic performance as it can enable them to get better jobs and excel in their career based on the knowledge and techniques they have learned in a classroom setting. It has been found that learning styles of students have an impact on their performance or academic achievements. For instance, a positive relationship between learning styles and academic achievement was found by [8&9]. Similarly, in a Study conducted on the university students in Iran, Moeni, Aliapour and Ghaderi reported that learning styles significantly effect students' performance. Moreover, they discovered that students with visual learning styles have the highest achievement. Conversely, students with logical and physical

learning styles have the lowest achievement [10]. Gokalp also discovered a positive relationship between learning styles and academic achievement in the context of Turkey [11]. At the same time, the teaching style of the instructor with respect to the leaner's motivation towards any particular style enables the student to acquire the maximum knowledge for a long time period and implement it in natural settings more effectively and efficiently [12]. This evidence indicates that learning styles affect academic achievement of students.

The principal objective of this study is to explore that how the relationship between learning styles and academic achievement prevails in the public sector universities of southern Punjab. The findings of this study will highlight those learning styles that can lead to higher academic achievement for the students by helping them in choosing an appropriate learning style. The study also provides empirical evidence on the impact of gender on academic performance. A significant relationship between learning styles and academic achievement will suggest that teachers shall emphasize those learning techniques that optimize student's academic performance.

LITERATURE REVIEW

Learning styles are important not only to know about the ways of learning of the students, but also essential to enhance their level of learning. Graham, Garton, and Gowdy conducted a study to examine the relationship between students' learning styles, the performance of instructor and academic performance of the students enrolled in the University of Columbia. Student's obtained score in the midterm and final-term exams were taken as measures to identify the relationship between teaching performance and academic achievement while learning styles were determined through a questionnaire. The results indicated a meager low positive relationship between learning styles of students and their academic performance [13]. Similarly, From the context of U.K, Spicer analyzed the relationship between cognitive learning styles of the undergraduate students and their academic performance. The questionnaire included assessment, learning, and cognition as instruments to observe that whether students' styles of learning and cognition effect their academic performance. Empirical findings suggested that learning styles have some impact on academic performance and students' choice of module selection, but the results were not consistent [14]. However, Manoochehr discovered that learning styles do not significantly affect academic performance in a teacher-centered or classroom learning environment. However, learning styles significantly influence academic performance in web-based or e-learning [15] .

Din explored the relationship between the learning approaches and the academic performance of 820 students enrolled in the Public sector Universities of Rawalpindi and Islamabad. Learning styles were determined by administrating Kolb's learning style Inventory while academic achievement was peroxide by their respective academic grades. The results of analyses indicated that the Diverging learning style was adopted by a majority of students while the students who adopted multiple learning styles obtained higher grade points [16]. Similar results were reported by Abidin et al., (2011). Furthermore, they argued that average and low achievers obtain higher scores on standardized achievement tests when they are taught according to their preferred learning styles. Moreover, styles of learning remained same for all subjects [8].

Shaw evaluated the effects of learning styles on the grade achievement of students by theoretical and computational assessment of Taxation subject. The results of the study revealed that converging and accommodating were the mostly adopted learning styles, though no significant relationship was found between learning styles and academic achievement of students [17]. Likewise, Farooq and Regnier observed the role of learning styles on the quality of learning of 218 on-campus students registered in Master Degree Programs at University of the Punjab, Pakistan. Analysis of data revealed that the majority of students preferred diverging and accommodating style. The study found no relationship between learning styles of students and their grades obtained in their previous exams [18].

From the context of Iran, Rahmani examined the relationship between learning styles of high school female students and their academic achievement. Their results indicated a positive correlation between learning styles practices of students and their academic grades [19]. Likewise, in a more recent study, Akbari, Ghanbari and Talab reported a significant relationship between learning styles and academic achievement of 488 English language students at high school in Iran. Findings suggest that learning styles shall be given due consideration to optimize students' performance, especially while teaching a second language. Furthermore, gender and individual difference also played an important role to improve student's learning ability [20].

From the context of Turkey, Caliskan and Kilinc investigated the learning styles and attitude of students towards the subject of social study in Turkey. The learning styles preferences were determined through survey and attitude scale was used to determine the achievement level in the particular subject. The results of the study indicated a positive and statistically significant relationship between the learning styles of primary school students and their attitude towards social study course [21]. Similarly, Orhun explored that whether academic success depends on upon the choice of learning style. He used David Kolb's learning styles inventory to discover the learning styles of students. The study found that academic performance was influenced by the choice of learning styles [22]. In a more recent study, Siddique et al., (2014) studied the perceptual learning approaches of the students on the basis of gender and academic achievement. The results of their study indicated strong effects of learning style of students on academic achievement. In addition, it was found that the combination of different learning styles was more helpful to learn appropriately [23].

Hasnor, Ahmad and Nordin studied the impact of learning styles of students on their academic performance in 233 students of International Education College of Malaysia. The study was descriptive in nature and a questionnaire was used to determine the preferred learning styles of students and their academic achievement. Their results indicated no relationship between adopted learning styles of students and their academic achievement [24]. On the contrary, in a study of 128 Malaysian high school students, Mohammad, Heong,

Hanafi and Kiong found that Visual Learning style was the most preferred learning style of sampled students. The study also reveals that learners have a significant difference in cognitive abilities and academic achievement [25].

Neale and Harrison observed the learning styles, study habits and academic achievement of students at the University of the West Indies using the survey research methods. The effect of the learning styles on students' academic achievement was not significant [26]. Bhatti and Bart observed the influence of learning styles on scholastic achievement levels. The sample consisted of 179 undergraduate students at the University of Minnesota. The Kolb's Learning Style Inventory was used as the instrument for data collection. The study found that assimilating learning style was the most adopted style. Academic achievement was strongly influenced by learning style and gender [27].

Gokalp evaluated the relationship between learning styles and academic success of the students enrolled in the faculty of education. Firstly, a pre-test was conducted to find the learning styles of students. Afterward depending upon the results of that pre-test effort was made to improve student's learning skills. A significant difference was observed between the pre-test and post-test learning of the sampled students. These findings revealed that academic success can be maximized by opting the appropriate learning style [11].

In an Indian study, Vaishnav explored the learning styles that students use to take information at secondary school level. The study also analyzed the relationship between learning styles and academic achievement. Results suggested that amongst the visual, auditory, and kinesthetic learning styles secondary school students predominantly used kinesthetic learning style to accomplish their learning endeavors. Moreover, the study found that learning styles significantly contributed towards an increased academic performance [12].

A detailed insight into the literature provides mixed findings on the learning styles and the academic achievement relationship. Moreover, past empirical work suggests that context of research and the choice of the sample can provide different results on the relationship between learning styles and academic achievement. This study adds value to the literature in a way that it reveals the learning approaches of the Education students and their impact on the academic performance in the public sector universities of Southern Punjab.

MATERIAL AND METHODS

The objective of this study was to examine the relationship between learning styles and grade performance of Master in Education enrolled in three public sector universities of southern Punjab during 2012-15. The survey research technique was used and learning styles of the students were identified on the basis of their response on 5 points Likert scale. Learning Styles Inventory established by David Kolb (1985) was used as a guideline to design the research instrument. Our final sample comprises 397 respondents, including both genders of which 119 respondents were from Bahauddin Zakariya University (BZU), Multan, 88 students from University of Education (UE), Multan Campus and 190 students from The Islamia University Bahawalpur (IUB). The academic performance of the students was measured by their respective semester grade points. SPSS was used for data analysis. Descriptive statistics, factor matrix correlation, regression analysis, and Analysis Of Variance (ANOVA) techniques were used to figure out the impact of learning approaches on the academic performance of the sampled students.

RESULTS AND DISCUSSION

Statistical results are obtained by using descriptive statistics, factor matrix correlation, regression analysis, and ANOVA. The results are discussed below.

The descriptive statistic is an important tool for research in the social sciences because it provides the general behavior of the survey data. The table below highlights the results of descriptive statistics about the score of learning styles that student obtained on the attitude scale.

Table 1: Descriptive Statistics of the Students Responses

Respondents	N	Range	Maximum	Minimum	$\bar{X}$	S.D
Total	397	67	191	124	160.8	12.7

The table 1 signifies that the mean score of all the sampled students on the scale of learning styles is 160.82 out of a total score of 200 which is an indication that the respondents use multiple learning styles during their learning process. This is quite obvious because social sciences students have to study a variety of courses that ranges from theoretical descriptions to complex mathematical models. This variety of subjects demands different learning techniques in different scenarios, which suits best to the requirement of the subject. The value of standard deviation shows the possible variations that exist in the attitude towards learning styles among sampled students.

It is important to examine the correlation between each learning style and academic achievement to understand that which learning style is more effective. Students' score for each of the learning style is compared with their respective CGPA to get the correlations between these two variables. correlation values are presented in Table 2.

Table 2: Factor-Matrix Correlation

Learning Style	Correlation with Academic Performance
Assimilating	.308**
Converging	.323**
Diverging	.262**
Accommodating	.314**
Overall	.392**

**. Represents 1% significance level

The above table reveals that all the correlation coefficients are significant at the 1% level. This reflects that sample students apply a blend of these four learning styles to obtain their learning. Thus, the sampled students which use multiple learning styles perform better than those who depend upon fewer or single style to accomplish their learning endeavors. One possible reason is that disciplines of social sciences like education have a variety of subjects ranging from purely theoretical ones to those involving complex mathematical models. This requires students to obtain learning by using different learning styles simultaneously rather than focusing on the single style of learning. Moreover, the students with the predominantly converging style of learning are better performers as shown by the higher correlation coefficient. On the contrary, students having more inclination towards diverging learning style have lower grade performance. This is apparent from the correlation factor of 0.26.

On an aggregate basis, the results reflect a moderate positive correlation between the learning styles adaptation by the students and their academic performance. The implication is that 1% adoption of learning styles increases academic achievement by 0.39%. Results suggest that all learning styles have a significant positive impact on the student's performance.

The regression analysis is performed to obtain a more objective and comprehensive view of the relationship between the learning styles and academic achievement of the sampled university students. Moreover, the gender is also incorporated as an explanatory variable in the regression model to check whether this variable has any effect on the student's academic achievement. The model statistics are segregated into three parts. The first part explains the model summary, the second part provides the ANOVA statistic, and the last part provides the coefficients of all the explanatory variables along with their t-statistic and p-values.

Table 3: Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.435[a]	.189	.179	.44882

a. Dependent Variable: Academic Achievement
b. Predictors: (Constant), Gender, Diverging, Assimilating, Converging, Accommodating

Table 3 (a): ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	18.311	5	3.662	18.180	.000[b]
Residual	78.562	390	.201		
Total	96.873	395			

a. Predictors: (Constant), Gender, Diverging, Assimilating, Converging, Accommodating

Table 3 (b): Coefficients

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.150	.309		.487	.627
Assimilating	.019	.006	.163	3.072	.002
Converging	.017	.007	.134	2.359	.019
Diverging	.007	.007	.057	.979	.328
Accommodating	.017	.007	.141	2.346	.019
Gender	.211	.055	.175	3.822	.000

a. Dependent Variable: Academic Achievement

The adjusted R square for the regression model is 0.179. This shows that 17.9% of the Variation in the sampled student's academic achievement is explained by the learning styles they adopt. The value of R square is justified on the ground that learning styles are not the only factor that affects the academic performance of the students, besides there are several other factors i.e., intellect, motivation, learning the environment and the like that can substantially affect student's academic performance.

Moreover, the results of ANOVA technique justified that the gender of the respondents and the learning styles cause significant variation in their academic performance. The results are robust as reflected by the F- statistic and a corresponding significance level of the model.

The table 3 (b) presents the coefficients, t-statistics and a significance level of the explanatory variables that are assimilating, converging, diverging, and accommodating learning style and the gender of the sampled university students. A positive significant t-statistic of assimilating learning style recommends that this style positively affects the academic performance of the students. Similarly, converging learning style was also found positively associated with a students' academic achievement and the results are significant at the 5% level. However, the impact of

diverging learning style on academic achievement was insignificant as disclosed by a p-value of 0.328. On the contrary, the empirical evidence disclosed a significant positive association between accommodating learning style adaptation and the resulting academic performance of the sampled university students. Interestingly, gender was found a significant variable to explain variation in the academic performance of the students. The sampled female students outperform male students in term of academic performance. A substantial t-statistic and corresponding p-value provides strong support to our arguments. However, these results are not generalizable because of the fact that there were 312 female students but only 85 male students in the sample. The further researches in this area shall investigate the role of gender in explaining student's performance in a sample with more even representation from both males and females.

CONCLUSION

It is an established fact that the choice of an appropriate learning style can play an important role in enhancing the academic performance of the students. In the light of the above findings, the majority of the students scored higher on the scale that measures learning style adoption of students. This is because of the fact that in learning scenarios, sampled students preferred to adopt a blend of learning styles rather than to be restricted to a single style of learning. The reason is, the field of social sciences like education has a variety of subjects ranging from purely theoretical ones to those involving complex mathematical models. This requires students to obtain learning by using different learning styles simultaneously rather than focusing on the single style of learning.

All the learning styles were found to be positively correlated with the academic performance of the students. Moreover, as per correlation statistics, students that predominantly adopted the converging learning style performed better than other students. This is attributed to the fact that the students following the converging style of learning rely on logical reasoning when making decisions, rather than deciding on the basis of feelings or emotions. In addition, Convergers actively practice examples and participate in discussions to achieve an optimal level of learning. The study reported a significant positive correlation between the aggregate score of learning styles and their grade performance. These findings suggest that the university students should adopt a range of different learning styles simultaneously to obtain optimal learning in different learning situations.

However, results of regression analysis postulated that assimilating learning style adoption was highly significant on the academic achievement of the sampled students. The assimilators are characterized to be active in understanding when confronted with the new situations. They think actively about experiences and are able to judge their significance. These are very important attributes which are required from a humanities student to evaluate social behaviors. Explaining both correlation and regression results together, it can be inferred that adoption of both converging and assimilating learning style, as per the requirement of a learning situation can enhance the academic performance of the students.

However, correlation results show that students with dominant diverging learning style have relatively lower academic performance than other students. Similarly, diverging learning style was found to be insignificant on the academic achievement of the students as per the results of the regression model. The possible reason could be that although divergers are imaginative and good at formulating ideas, but sometimes they learn by accidental learning which is based on reflective observation. Therefore, sampled students with predominantly diverging learning style performed somewhat lower than students with other learning styles.

The empirical evidence revealed that gender has a significant effect on the academic performance of the students. Implying that the sampled female students performed significantly better than male students. In addition, ANOVA statistics exposed significant differences in the learning styles of sampled universities. Suggesting that, the university has a strong influence on students in adopting the learning styles. These results are attributed to the fact that universities have differences in course contents and teaching styles in classroom settings. These dissimilarities across universities pose different demands on the students to obtain learning which results in different learning styles adaptation by students across sampled universities.

Based on the study findings, it is recommended that learning styles should be given due consideration by the students and educationists. It is, however, suggested that students should know those learning styles that suits best to their discipline. Moreover, considering the diversity of courses, Social science students should focus on adopting multiple learning styles to boost their academic performance. The reason is perhaps in different learning settings, Students will be able to choose the learning style that yields maximum learning outcomes. Moreover, students should focus more on converging and assimilating learning style to achieve academic excellence. Likewise, the teaching methods should promote those learning styles that lead to increased academic performance of the student. In addition, instructors should apply those teaching techniques that suits best to the demand of their subject.

FUTURE RESEARCH DIRECTIONS

Future research in this area should focus on the following key dimensions.

1. Learning style is not the only factor that influence academic performance. As, there are several other variables like student's motivation, self-efficacy, aptitude, and socio-economic status that can significantly impact their grade performance. So the future studies shall incorporate these factors to observe their effect on the academic achievement of the university students.
2. The study found the significant effect of gender on academic performance, but these results could not be generalized because the male students were even less than one-third of the female students. The future studies in this area should investigate this phenomenon on a sample with balanced representation from both genders.

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