

## CORRELATION OF PERSONALITY AND LEARNING STYLES OF STUDENTS WITH THEIR ACADEMIC PERFORMANCE

Sawera Mansoor, Taskeen Mansoor\*

Foundation University Medical College Islamabad Pakistan, \*National University of Medical Sciences (NUMS) Rawalpindi Pakistan

### ABSTRACT

**Objective:** To examine the correlation between personality and learning styles of students with their academic performance.

**Study Design:** Descriptive correlational study.

**Patients and Methods:** After informed consent, data was collected from 136 final year students of a business administration course using the self-report 'Learning Styles Questionnaire' and 'Big Five Inventory'. The academic performance was recorded using end of the semester grade point average (GPA). Data was analyzed using SPSS 20.

**Results:** The mean age of participants was 20.74 years with mean GPA being 2.72. Of all, 70 (51.4%) were females and 66 (48.5%) were males. The participants were found to use all the four learning types namely activist, theorist, reflector and pragmatist. The most common combination of learning style preferences in decreasing order of frequency were: Theorist/Reflector, Theorist/Pragmatist, Reflector/Pragmatist and Pragmatist/Activist. Significant positive correlation ( $r=\pm 0.243$ ,  $p<0.01$ ) was found between theorist learning style and academic performance while the rest of the learning styles were not significantly correlated with the academic performance of the students. As regards personality domains, the zero-order Pearson correlations showed significant positive correlation between conscientiousness and academic performance ( $r=0.413$ ,  $p<0.01$ ) whereas Neuroticism and GPA exhibited a negative correlation ( $r=-0.278$ ,  $p<0.01$ ).

**Conclusion:** The students using predominantly theorist learning style fared better in end semester GPA. Conscientious students had better grades, while higher level of neuroticism was correlated with poor academic performance. Facilitating specific educational needs of students based on their personality and learning styles may improve academic performance.

**Key words:** Academic performance, Educational psychology, Learning, Personality.

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### INTRODUCTION

Education is a competitive field, and it is the aim of educational institutes to establish and maintain academic excellence in order to produce graduates who can excel in various fields of life. Therefore the factors contributing to academic excellence of students have been an important area of interest for all stakeholders. A review of the relevant literature reveals that student performance is influenced by a number of variables such as socio-demographic, personal/psychological and environmental factors<sup>1,2</sup>.

Research work has also identified person-

ality as one of the determinants of academic performance. The five factor model of personality has been used to provide a comprehensive framework for highlighting the personality characteristics of students, and for substantially advancing our understanding of the link of these traits to academic success<sup>3</sup>. In 2013, Akomolafe used the Big Five Inventory to assess personality domains of 398 students and concluded that the personality factors accounted for 18% of the total variance in academic performance of the students<sup>4</sup>. In another study by Bhagat and Nayak in 2014, students in India in their preclinical years were found to have a significant correlation between neuroticism and academic grades<sup>5</sup>.

Another important variable contributing to academic performance is the learning style

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**Correspondence:** Dr Sawera Mansoor, House No C-22, Street No 18, DHA Phase-I, Islamabad Pakistan

Email: sawera85@gmail.com

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adopted by the students. Learning styles can be regarded as the individual's way of receiving and processing information. Honey and Mumford proposed a classification of learning styles into activists, reflectors, theorists, and pragmatists for all types of learners<sup>6</sup>. When the teaching methodologies complement the learning style of students, it may result in enhanced performance and better academic outcomes<sup>7,8</sup>.

From a Pakistani perspective, there is a paucity of local studies that incorporate multiple contributory factors in the study design. Therefore the present study was conceptualized to incorporate the variables of personality domains, learning styles; and assess their relationship with the academic performance of students in a private sector university of Islamabad. The research findings would provide valuable information for all stakeholders to recognize the need to ensure availability of appropriate supportive interventions to improve the academic performance of students.

## **PATIENTS AND METHODS**

This was a descriptive correlational study, where convenience non probability sampling was used to select the participants enrolled in the final semester of a business administration course at the study venue (a private sector university in Islamabad) during the study period of 3 months (Sep to Dec 2015). Total 136 students, both male and female, aged 18 to 25 years, were made part of the sample based on their availability and consent. The researchers also obtained ethical approval from the Institutional review board. Students with a pre-existing psychiatric, medical or surgical condition were excluded from the study, along with those students who did not appear in the previous end of semester examinations. After written informed consent was obtained from each participant, each individual was assigned a serial reference number (written on their set of questionnaire booklet) and all data was subsequently handled in total anonymity and confidentiality. The relevant socio demographic details including

the age, gender of the students participating in the research were entered in a specially designed data collection form. The study participants were then handed the Questionnaire booklet comprising of learning styles questionnaire (LSQ) and the big five inventory (BFI). Academic performance was assessed by grade-point-average (GPA) and students reported their GPA from their last semester.

## **Data Collection Instruments**

### **• Learning Styles Questionnaire (LSQ)**

Honey and Mumford proposed a classification of learning styles into activists, reflectors, theorists, and pragmatists for all types of learners. The 40 item self-report LSQ is largely considered a useful and potent tool to measure the learning styles of students from diverse backgrounds<sup>6</sup>. Research has shown that data generated by the use of LSQ can be effectively used to generate appropriate and matching learning activities and instructional strategies<sup>9</sup>.

### **• Big Five Inventory (BFI)**

It is a 44 item self-report inventory based on five personality factors of extraversion, agreeableness, conscientiousness, neuroticism, openness to experience. The items are rated on a five point scale ranging from strongly agree to strongly disagree with 3 as neutral response<sup>10</sup>. Coefficient alphas have been reported to range from 0.63 to 0.82, and there is substantial evidence of convergent validity of BFI with other commonly used personality tests. In a Pakistani study, BFI was recommended over personality tests using three factor model in order to evaluate broader facets of each personality domain<sup>11</sup>.

## **Data Analysis**

The data was entered and analyzed using SPSS version 20.0. The variables in this study included: Age group, gender, scores on learning style questionnaire and big five inventory. The outcome variable was the academic performance measured through GPA of the students obtained in their last end of semester examinations. Descriptive statistics (mean,

standard deviation, and percentages) were used for summarizing the study variables. Chi square test was used for categorical variables (gender and grades of GPA) and relationship between quantitative variables (scores on Learning Style Questionnaire, Big Five Inventory and GPA) was analysed using Pearson's correlation test. A *p*-value of <0.05 was considered as significant.

**RESULTS**

**Characteristics of Sample Population**

The total number of study participant was 136. The mean age of the students was 20.74 years (SD + 1.452) with a range of 18 to 26 years. Of all, 70 (51.4%) were females and 66 (48.5%) were males. The mean GPA of the students was 2.72 (SD + 0.472) with a range of 0.83 to 3.90. High

Pragmatist, Reflector/ Pragmatist and Pragmatist/ Activist. Table-II shows the correlation of learning style preferences with the GPA of students. There was a significant positive correlation between Theorist learning style and academic performance; while the rest of the learning styles were not significantly correlated with the academic performance of the students.

**Personality Profile of Students:**

The majority of participant students scored higher than average on the personality domains of agreeableness, conscientiousness and openness to experience, while lower than average scores were recorded for the Neuroticism subscale as seen in table-III. Table-IV summarizes the zero-order Pearson's correlations between academic

**Table-I: Gender difference in academic performance.**

		Females (n=70)	Males(n=66)	Both (n=136)	Test
GPA	Low	17 (47.3)	19 (52.8)	36 (26.4)	$\chi^2 = 8.137$ $p=0.017$
	Average	34 (66.7)	17 (33.3)	51 (37.5)	
	High	19 (38.8)	30 (61.2)	49 (36.0)	

**Table-II: Correlation of learning styles preferences with GPA.**

	T	A	P	R	GPA
Theorist (T)	1	0.143	0.433**	0.454**	0.243**
Activist (A)	0.143	1	0.276**	-0.037	0.010
Pragmatist (P)	0.433**	0.276**	1	0.359**	0.107
Reflector (R)	0.454**	-0.037	0.359**	1	0.038
GPA	0.243**	0.010	0.107	0.038	1

\*\**p*<0.01

GPA was found more frequently in males than females (61.2% vs. 38.8%, *p*=0.01) as shown in table-I.

**Learning Style Preferences of Students:**

The participant scores on 'Learning styles Questionnaire' were analyzed for each student to categorize him or her to one of the four learning styles described by Honey and Mumford: Activist, Reflector, Pragmatist, and Theorist. The mean and standard deviation for our sample was: Activist (11.46 ± 3.030), Reflector (13.91 ± 3.383), Pragmatist (13.01 ± 3.209), and Theorist (12.5 ± 2.988). The most common combination of learning style preferences in decreasing order of frequency were: Theorist/ Reflector, Theorist/

performance and other measures in the study. The results show that significant positive correlation was obtained between academic performance and Conscientiousness (*r*=0.413, *p*<0.01) whereas Neuroticism and GPA exhibited a negative correlation (*r*=-0.278, *p*<0.01). However, no significant relationship was found between academic performance and Extraversion, Agreeableness and Openness to Experience

**DISCUSSION**

Our study focused on the learning styles and personality profiles of students, and the correlation of these variables with their academic performance. The sample population of 136

students taken from a private sector Science and Technology University in Islamabad had a balanced gender proportion. The male students scored a significantly higher GPA than their female counterparts. In addition to individual student potential and biological differences in cognitive processing of both genders, gender differences in academic achievement may also be influenced by parental and teacher expectations which in turn affect the choice of subjects and differential course taking. Therefore previous studies have revealed rather inconsistent results

### Learning Style Preferences of Students

Using the learning styles questionnaire (LSQ), the participants of our study were found to use all the four learning types namely activist, theorist, reflector and pragmatist. The most common combination of learning style preferences in decreasing order of frequency were: Theorist/ Reflector, Theorist/Pragmatist, Reflector/ Prag-matist and Pragmatist/Activist. These results are partly similar to the observations of Rasool and Rawaf about the distribution of learning styles in the nursing

**Table-III: Distribution of personality domain scores.**

Personality scores	Student's Personality Domain (n=136)				
	Extraversion	Agreeableness	Conscientiousnes	Neuroticism	Openness to Experience
Low	29 (21.3)	24 (17.6)	43 (31.6)	71 (52.2)	20 (14.7)
Average	81(59.6)	49 (36.0)	33 (24.3)	33 (24.3)	40 (29.4)
High	26 (19.1)	63 (46.3)	60 (44.1)	32 (23.5)	76 (55.9)
Mean ± SD	50.57 ± 8.437	54.47 ± 10.88	52.41 ± 9.725	47.29 ± 9.07	56.65 ± 11.46

\**p*<0.05, \*\**p*<0.01

**Table-IV: Correlation of personality domain scores with GPA.**

	E	A	C	N	O	GPA
Extraversion (E)	1	0.126	0.187*	-0.107	0.218*	0.042
Agreeableness (A)	0.126	1	0.515**	-0.223**	0.711**	0.026
Conscientiousness (C)	0.187*	0.515**	1	-0.274**	0.566**	0.413**
Neuroticism (N)	-0.107	-0.223**	-0.274**	1	-0.181*	-0.278**
Openness to Experience (O)	0.218*	0.711**	0.566**	-0.181*	1	0.163
GPA	0.042	0.026	0.413**	-0.278**	0.163	1

concerning gender differences in different domains of school achievement<sup>12</sup>. In a study conducted at a tertiary institute in Singapore including 144 students, female students were found to have higher cGPA scores than the scores of their male counterparts<sup>13</sup>. However a recent meta-analysis of National Assessment of Educational Progress assessments found a stable mean sex difference favoring male students in mathematics and science across the past two decades in the United States<sup>14</sup>. The majority of our students were taking Science and Mathematics courses which may have accounted for higher GPA showed by the male students in our study.

students. They found in their study that 44% students were reflectors while 33% were dual reflector/ theorists<sup>15</sup>. Similarly in an Indian research including 135 medical students, the reflector learning style was found to be the most preferred<sup>16</sup>. Our study we found the reflector learning style preference to be more commonly seen in male students, and this gender difference was statistically significant. Similar to our findings, the authors of an article focusing on learning styles of medical students in Sialkot concluded that there was preponderance of males in reflector style and of females in pragmatist style; however this difference was not significant<sup>17</sup>. Research has shown that a single instructional strategy may not be suitable for

students with various different learning processes. Identifying the various dimensions of learning styles provides educators with the relevant information allowing them to maximize student learning. Once teaching methods incorporating a variety of learning styles are developed and used, it appears to promote optimal educational outcomes<sup>18</sup>. We found a significant positive correlation between theorist learning style and academic performance of students. This finding was comparable to a recent study conducted to evaluate the learning styles of a cohort of first year medical and dental students at Queen's University Belfast<sup>19</sup>. These authors also concluded that the learning style associated with the greatest number of significant positive correlations was theorist style. In contrast to our findings, a local author observed no statistically significant correlation between different learning styles and academic grades in medical students<sup>17</sup>. Thus the literature review shows varied results as far as learning styles and academic performance is concerned, highlighting that a complex relationship exists between the two. Since theorists learn best when allowed to analyze concepts through lectures, interactive discussions, and question-answer sessions; our finding may reflect the common instructional strategies and modes of class room teaching prevalent in the university under study.

### Personality profile of the students

The majority of participant students scored higher than average on the personality domains of agreeableness, conscientiousness and openness to experience, while lower than average scores were recorded for the Neuroticism subscale. The male students scored higher than their female counterparts. There were statistically significant differences among the two groups in the personality domain scores of agreeableness, conscientiousness and Openness to Experience. Conscientious students exhibit self-discipline, and they are generally dutiful and hard working. These personal attributes appear vital for learning and academic pursuits. Consistent with previous literature where conscien-

tiousness has been found to have strong links with academic achievement<sup>2,3</sup>, our study also showed a significant positive correlation between academic performance and conscientiousness ( $r=0.413$ ,  $p<0.01$ ). Similar to our research, a Malaysian study on 246 health sciences students was conducted to explore the relationship between the big five factors of personality and level of academic performance, and students with conscientiousness personalities were found to be positively associated with academic performance<sup>20</sup>. Another recent study conducted in China examined the interactions between the big five personality traits and self-determination motivation orientations along with their effect on academic performance of 249 primary school students in China<sup>21</sup>. Significant interaction effects were found between conscientiousness and self-determined motivation, and conscientiousness positively predicted academic performance.

Regarding neuroticism, our study findings revealed that neuroticism had a significant negative correlation with the academic performance of students ( $r=-0.278$ ,  $p<0.01$ ). This result corroborated the findings of previous researchers who reported negative associations between neuroticism and academic performance<sup>3,21</sup>. Similarly in a study by Bhagat and Nayak 2014, students in India in their preclinical years were found to have a significant inverse correlation between neuroticism and academic grades<sup>5</sup>. This result is not surprising because neurotic students are usually unstable emotionally, and may not perform well due to the stress of academic evaluations. Although some previous research has reported the importance of the personality domains of Extraversion, Agreeableness and Openness to Experience<sup>2,3</sup>, we found no significant relationship between these domains and the academic performance of students. This is similar to conclusion of a research in Romania where extraversion was only weakly correlated with academic performance<sup>22</sup>.

Regarding the limitations of this project, this study was a cross-sectional research using non probability sampling technique. Self-adminis-

tered questionnaires may also produce a recall/social desirability bias. Therefore the findings cannot be generalized to larger population and it is recommended that future work should employ longitudinal methodologies in order to establish causal relationship between the variables of the study. Notwithstanding, the present study has contributed to the literature on the significant contribution of learning style preferences and personality profile towards the academic performance of university students.

## CONCLUSION

The students using predominantly theorist learning style fared better in end semester GPA. Conscientious students had better grades, while higher level of neuroticism was correlated with poor academic performance. Facilitating specific educational needs of students based on their personality and learning styles may improve academic performance.

## CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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