ORIGINAL ARTICLE

Impact of social and psychological factors on academic achievement of university students

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ABSTRACT

Aim To examine the correlation between personality traits, learning styles, and academic achievement and a difference between students' gender, residency status and academic achievement.

Methods The study included 95 students of first year of the School of Medicine, University of Sarajevo. The survey used the sociodemographic questionnaire, Index of Learning Style and Big Five Inventory. Academic achievement was represented by a cumulative grade point of each student.

Results There was significant difference between the students' gender, information processing style, i.e. active/reflective learning style and academic achievement. Academic achievement was correlated with extraversion (negatively), conscientiousness and active/reflexive learning style.

Conclusion With this study we wanted to improve awareness of teachers about the importance and use of different styles during lecture, to show the importance of students knowing their own preferences and learning styles, and how personality traits can affect students' academic achievement. Academic performance is an important outcome for students. It can increase motivation, student participation in class and wish to volunteer in different activities.

Key words: learning styles, performance, personality traits, residency

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INTRODUCTION

Finding out what variables affect academic performance is one of the areas of interest for both students and teaching professors, as well as many different science disciplines. The final grade is a direct indicator of a student's achievement on a particular course in a given semester. According to Steinmayr, Meiβner, Weidinger and Wirthwein (2014) academic achievement is the result of work that shows the extent to which a person has achieved a goal that has been the focus of one's activity. Given that schools are most focused on cognitive goals, related to knowledge acceptance, critical thinking and/or intellectual field of work, academic achievement should be represented by a wide range of different constructs containing different learning domains. The definition itself depends on the indicators used to measure academic achievement (1).

According to many studies personality traits are among significant factors that influence a student's academic achievement (2-4). Personality influences a student's academic ability, his/her achievement, and student's approaches to learning. Also, personality traits influence student's behaviour, that is, his/her learning habits (4). This means that personality traits are crucial in predicting student's academic achievement. The Big Five personality traits include neuroticism, extraversion, agreeableness, conscientiousness and openness to experience (5).

According to Felder and Spurlin (6) learning styles are ways of learning that each student has. They are defined as cognitive, affective, and psychological characteristics and function as indicators of how the student learns and responds to the learning environment (6). Felder and Silverman (7) have described four dimensions of learning styles including active-reflective, sensing-intuitive, visual-verbal, and sequential-global. The first dimension refers to the way information is processed. Persons who are active learn best by working actively with learning material, applying knowledge, and are interested in working in groups where they can discuss the learned material. On the other hand, reflective individuals prefer to work independently and think about the material they are learning. The other dimension is sensing/intuitive, at one end of this dimension sensing students prefer to learn facts, solve problems by standard approaches, and apply the learned material to the real environment. Students who prefer intuitive style prefer to learn abstract material, such as theories, their meanings, are more creative and able to discover different possibilities and relationships. The visual-verbal dimension differentiates students' perceptual preference. The fourth dimension is sequential/global and it refers to understanding content. Sequential style refers to students learning in small steps, paying attention to details, and accordingly having a linear progression during learning. Others who prefer a global style learn material almost unknowingly without seeing the connections, but subsequently finding connections between different areas. They also tend to solve complex problems (7,8).

It is important for teachers to identify different student preferences in order to improve the teaching process. They can accomplish this by adapting the teaching style and activities to specific student preferences and combining different methods throughout the teaching process. This method strikes a balance between students learning styles and teachers teaching methods (2,9).

The aim of the study was to examine the correlation between personality traits, learning styles, and academic achievement, as well as a difference between students's gender, residency status and academic achievement.

EXAMINEES AND METHODS

Examinees and study design

This cross-sectional study enrolled 95 students (78 female and 17 male; average age was 19 years) who attended the first year of the Medical Faculty, University of Sarajevo, Bosnia and Herzegovina. Participation of all students was on a voluntary basis. All students were approached and asked to fill the online questionnaire and were given a link with a web address to access the questionnaires. All the questionnaires were made via online platform (Google Forms), without being able to skip questions, so there would be no missing data. Completing the questionnaires took about 15 minutes.

The study was approved by the Ethics Committee of the Medical Faculty, University of Sarajevo.

Methods

The sociodemographic questionnaire, Index of Learning Style (10) and Big Five Inventory (5) were used.

The sociodemographic questionnaire was constructed for the purposes of this research and refers to data related to gender, age, residential status and place of residence during high school.

The Index of Learning Style (ILS) developed by Felder and Soloman (2004) (10) was used to measure learning styles. The Index of Learning Style has 4 dimensions: active/reflective, sensing/intuitive, visual/verbal and sequential/global with 11 items for each scale (10). Participants need to choose only one answer that returned to them. Score 1 or 3 represents balanced style on the two categories of the dimension, with only a mild preference for one or the other. Score 5 or 7 represents moderate preference for one category of that dimension, and 9 or 11 strong preference for one category of that dimension.

The Big Five Inventory (BFI) was developed by John and Srivastava (1999) (5). The instrument is a 44-item inventory that was developed to assess the Big Five personality domains of neuroticism, extraversion, agreeableness, conscientiousness and openness to experience. Respondents indicated their level of agreement with each of the 44 items using a 5-point Likert scale (1=disagree strongly, 5=agree strongly); 16 items were reverse-scored. The items were described in behavioural, cognitive, and affective terms (5).

Academic achievement was represented by the cumulative grade point of each student, high scores represented a higher level of academic performance.

Statistical analysis

The first performed test was normality of distribution. Due to the significant deviation of distribution from normality, the collected data were analysed by nonparametric procedures. For data processing Kruskal Wallis test and Spearman's correlation coefficient (r) were used. The significance level for all statistical tests was set at the $p<0.05$.

RESULTS

A statistically significant difference between the students' gender and the academic achievement was found: females have better academic achievement than males ($x^2 = 8.36$; $p<0.01$) (Table 1).

Table 1. Kruskal Wallis test results for gender, learning style model and academic achievement

Variable	No of students	Median values for groups	p
Gender			
Male	17	30.53	<0.01
Female	78	51.81	
Residency status			
With parents	53	49.58	>0.05
With roommate	20	45.05	
Alone	22	46.86	
Active / Reflective			
Very strong active	9	63.00	
Moderate active	20	60.50	<0.05
Balanced	55	62.67	
Moderate reflective	9	66.67	
Very strong reflective	2	67.00	
Sensing / Intuitive			
Very strong sensing	24	62.40	
Moderate sensing	34	65.10	>0.05
Balanced	34	61.60	
Moderate intuitive	2	62.50	
Very strong intuitive	1	72.00	
Visual / Verbal			
Very strong visual	14	64.00	
Moderate visual	36	61.71	>0.05
Balanced	35	63.40	
Moderate verbal	9	63.33	
Very strong verbal	1	67.00	
Sequential / Global			
Very strong sequential	3	68.00	
Moderate sequential	22	62.25	>0.05
Balanced	62	63.00	
Moderate global	8	62.67	
Very strong global	0		

There was also a statistically significant difference between the information processing style and achievement ($p<0.05$). According to the median, students who were moderate (median=66.67), i.e. very strong reflective (median=67.00) had better academic achievement than students whose style was balanced (median=62.67), or moderate (median=60.50), or very strongly active (median=63.00).

There was no statistically significant difference in residency status ($p>0.05$) between the students who lived with roommates, with their parents or alone in academic performance.

Academic achievement was statistically significantly negatively correlated with extraversion ($r=-0.326$; $p<0.01$). There was also a statistically significant correlation between conscientiousness and academic achievement ($r=0.217$; $p<0.05$). According to the correlations of academic achievement and learning methods only active/reflexive learning style showed statistical-significance ($r=0.254$; $p<0.05$), e.g. there was a statistically significant correlation between students who

reflexively processed received information and better academic performance (Table 2).

Table 2. Correlation between personality traits, learning methods and academic achievement

	N	E	A	C	O	A-R	S-I	V-V	S-G	AA
N	1	-.302*	-.357*	-.415*	-.167	.204†	-.028	.229†	-.023	.073
E		1	.002	.245†	.093	-.353*	-.029	-.270*	-.041	-.326*
A			1	.292*	.128	-.307*	.063	-.085	-.063	-.098
C				1	.256†	-.009	-.158	-.141	-.168	.217†
O					1	-.145	.420*	-.213†	.060	.013
A-R						1	-.183	.194	-.021	.254†
S-I							1	-.197	.180	-.027
V-V								1	-.087	.028
S-G									1	-.023

N, neuroticism; E, extraversion; A, agreeableness; C, conscientiousness; O, openness to experience; A-R, active-reflective; S-I, sensing-intuitive; V-V, visual-verbal; S-G, sequential-global; AA, academic achievement; *statistically significant at the level of 0.01; †statistically significant at the level of 0.05

When considering learning styles with personality dimensions, active/reflexive ($r=0.204$; $p<0.05$) were statistically significantly positively correlated with neuroticism, negatively correlated with extraversion ($r=-0.353$; $p<0.01$) and agreeableness ($r=-0.307$; $p<0.01$). Visual/verbal was statistically significantly positively correlated with neuroticism ($r=0.229$; $p<0.05$), statistically significantly negatively correlated with extraversion ($r=-0.270$; $p<0.01$) and openness to experience ($r=-0.213$; $p<0.05$). Sensing/intuitive was statistically significantly correlated with openness to experience ($r=0.420$; $p<0.01$).

DISCUSSION

There was significant difference between the students' gender, information processing style and academic achievement. Academic achievement were correlated with extraversion (negativly), conscientiousness and active/reflexive learning style.

Relationship between residency status of the students and academic achievement were explored in many studies. Some studies found difference between residence status and academic performance (11,12) emphasizing that students living in dormitories have better academic performance. Considering that by living in dormitories students can receive opportunities for social support and resources that they need (13). However, the result of Etikan et al. study showed no differences in academic performance among residency status of students (14). Possible explanation for this is that the first year students need to adjust to a new environment, find new friends or adjust to live away from family and with a roommate (15). The results of our research are also in line with this statement, there was no statistically significant difference in academic performance between the students who lived with roommates, with their parents or alone.

In our study female students had better academic achievement than males. The results of Tsai and Shirley (16) show that females prefer sensing learning styles and sequential more than male students. Also, female students are more participative and collaborative than male students (17).

Our research showed that students have balanced learning preference across four dimensions and this is in line with results of Tsai and Shirley (16) study. In our research students who prefer a reflexive way of processing information had better academic performance than students who preferred the active way. This dimension was also correlated with academic achievement. In our research extroverted person preferred active learning style, and introverted person preferred the reflexive learning style. Also, sensing style is the most dominant style possessed by students (61.1% very strong or moderate) and they prefer to apply the learning material to the real environment and to solve problems by standard approaches. Also students (55.6%) like to learn and better memorize when information is presented with charts, graphic, through visual dimensions. Most of the students (26.4%) prefer sequential learning style over 8.4% of students who prefers global learning styles. This is supported by previous research where students preferred sensing learning style over intuitive, visual over verbal (9, 18), active over reflective and sequential over global learning styles (18).

The results obtained in this study suggest that some personality traits are correlated (with statistical significance) with academic achievement. Extraversion was negatively correlated with academic achievement. Introverted students in our study had significantly higher grades and higher academic performance, which is in line with the results of previous research (2), where introvert students spend more time learning while extroverts spend more time socializing or may also neglect learning by seeking other activities. It is also assumed that people who are introverts prefer written assessments, while extroverts may benefit more during oral presentations and exams (4).

In our study, conscientiousness was also statistically significantly positively correlated with academic achievement, which is in line with Karatas (3), students who are more conscientious have higher academic achievement. Conscientiousness also affects academic achievement, since individuals who are high on the dimension of conscientiousness strive for higher levels of achievement, order, and responsibility. Accordingly, being diligent clearly leads to positive results (4).

In our study the dimensions of neuroticism, agreeableness and openness to experience were not correlated with academic achievement.

With this study, we wanted to increase the awareness of teachers about the importance and use of different styles during lectures. Also, we would like to show the importance of students knowing their own preferences and learning styles and how personality traits can affect students' academic performances. Academic achievement is an important outcome for students. It can increase motivation, student participation in class and wish to volunteer in different activities. A communication between teachers and students will be improved in this way (9,18).

There were several limitations in the presented study. Firstly, there was a potential for sampling bias because sample size was small and, furthermore, it was longitudinal; additionally, the sample was selected only among students of the School of Medicine and it is hard to generalize our findings to all Sarajevo University students. Secondly, we did not consider potential health problems that could interfere with our results.

In conclusion, academic achievement is a complex outcome which is important for students. Female students, who prefer a reflexive way of processing information, work independently, think about lecture topic. Also, students with low score on extraversion and/or high level on conscientiousness have got better academic achievement.

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TRANSPARENCY DECLARATION

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