

The Learning Styles and Personality Traits of Undergraduates: A Case at a State University in Istanbul

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ABSTRACT This paper investigated dominant learning styles and personality traits, and their relationships among 224 undergraduates. It employed a quantitative research approach with a descriptive statistical method. Three instruments in the form of questionnaires were used to collect data: A demographic data form; a learning style inventory (Kolb's Learning Style Inventory); and a personality trait inventory (The Big Five Inventory). Statistical Package for the Social Sciences (SPSS, version 17.0) was used for statistical analysis. Results indicated that the most frequently occurring learning style was 'assimilator', and there was no significant relationship between the various learning styles and gender, department, or Grade Point Average (GPA). Further findings indicated that the most frequently occurring personality trait was 'agreeableness', and there was no significant relationship between their personality traits and gender, department, or GPA. Finally, there was no significant relationship between the students' learning styles and their personality traits.

INTRODUCTION

The idea that each individual is unique is as old as civilization. Modern research has shown that individuals differ in specific human characteristics such as memory, motivation, decision-making, and language learning (for example, Nicholls et al. 1989; Riding et al. 1993; Oxford and Ehrman 1994; Covvay 1996). Such differences have been studied in educational settings, revealing significant differences in how students comprehend and learn new material (Fowler 2002; Contessa et al. 2005). As a result, researchers have developed models to explain how learners differ from one another when gathering, comprehending, and retaining information (Cassidy 2004). One assumes that if the learning differences of students are understood and taken into account, the effectiveness of educational processes can be increased. Along the same line, "Provision of the same instructional conditions to all students can be pedagogically ineffective"

(Akbulut and Cardak 2012: 835). The literature offers controversial perspectives on whether teaching strategies and learning styles need to be congruent; thus, pursuing specific conclusions for particular populations gains importance (Tulbure 2012). As Keefe and Ferrell (1990) have stated, "Learning style assessment can provide the basis for a more personalized approach to student advisement and placement, instructional strategy, and evaluation of learning" (p. 57). Tulbure's (2012) paper supports the similar idea that students might achieve better with some teaching strategies that may suit their learning styles.

Teacher candidates need to become aware of their learning styles so that they are more empathetic toward their students' learning (Smith 2002). Personality has also been pointed out as an important factor for the professional performance of teachers (Djigic et al. 2014; Lee and Kemple 2014).

Freire (1970) described schooling as "banking education," because schools invest a certain amount of information in the minds of students and then withdraw it when the time comes. According to Freire, all students in modern classrooms are seen to be alike. They listen passively to what the teacher says and sooner or later the teacher takes back whatever it was that he or she had said. Freire's ideas are still valid today, at

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least in Turkey, where individual differences are not widely taken into account. Although there are some studies of learning styles in the Turkish context (Gulten and Gulten 2004; Ozsoy et al. 2004; Peker 2005; Demir 2006; Hasirci 2006; Ates and Altun 2008; Demir 2008), few have examined the personality traits of students and the relationship of personality traits to individual learning styles, both of which are relevant to the development, design, and implementation of curriculum and instruction (Threeton and Walter 2009; Moldasheva and Mahmood 2014).

This paper investigated: (1) the dominant learning styles and personality traits of students in the teacher education program of a state university; (2) the relationship of learning styles and personality traits to gender, department, and Grade Point Average (GPA); (3) any relationship that might exist between the students' learning styles and personality types. The researchers chose Kolb's Learning Style Model (1984) as the learning style construct and The Big Five Model of Personality as the personality construct. By examining individual diversity in an educational setting, this paper can (1) contribute to the development of a holistic curriculum considering both cognitive processes and personality; and (2) help teaching professionals to identify and serve the educational needs of students, thus increasing the effectiveness of the learning process. The literature relevant to (a) learning style models with specific reference to Kolb's Learning Style Model, (b) theories of personality with specific reference to The Trait Perspective and The Big Five Factor Model of Personality, and (c) the relationship between learning styles and personality traits is elaborated below.

Learning Style Models

There is no general agreement among researchers concerning a definition of the term 'learning style'. For example, Kolb (1984) defined it as an individual's preferred way of gathering information, whereas Dunn (1984) defined it as an individual's way of absorbing and retaining information or skills. Keefe and Ferrell (1990) defined it as "a gestalt combining internal and external operations derived from the individual's neurobiology, personality, and development and reflected in learner behavior" (p. 59). DeBello (1990) defined it more simply, "Learning style is the way people absorb process and retain information" (p. 203).

There are several models describing learning styles, including the Dunn and Dunn Learning Style Model (Dunn et al. 1984), Grasha and Riechman's Style of Learning Interaction Model (1974), Reinert's Learning Style Model (1976), and Gregorc's Learning Style Delineator (1982). Kolb's Learning Style Model has been selected for this paper because of its widespread use in research (Askin 2006) and its applicability to adult learners in Turkey, but McCarthy's 4MAT System (1980), Honey and Mumford's Learning Preference Model (1992), and Zhang and Sternberg's (2005) Threefold Model of Intellectual Styles are also used in research.

Kolb's Learning Styles Model

Kolb developed his model from his theory of experiential learning, which was inspired by Dewey et al. (Kolb 1984). In his analysis of learning, two characteristics stand out: (1) the process of learning is more important than the outcomes; and (2) knowledge is continuously created and recreated by a process of transformation. He described experiential learning in four stages involving four adaptive learning modes: (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation. All stages in this cycle are required for learning to take place; in Kolb's words, "Learning requires both a grasp or figurative representation of experience and some transformation of that representation" (1984: 42).

Based on this learning cycle, Kolb (1984) proposed four forms of knowledge which are created by a combination of apprehension and transformation: (1) divergent knowledge, (2) assimilative knowledge, (3) convergent knowledge, and (4) accommodative knowledge. These forms correspond to Kolb's classification of learners according to their learning styles: divergers, assimilators, convergers, and accommodators. Convergers grasp experience through active conceptualization and transform experience through active experimentation. Divergers, the opposite of convergers, employ a combination of concrete experience and reflective observation. Assimilators learn through a combination of abstract conceptualization and reflective observation. Accommodators grasp experience concretely and transform experience actively.

The various conclusions of studies that used Kolb's Learning Style Model suggest that no single learning style dominates the student pop-

ulation. For instance, in Turkey, Kilic (2002), Harsirci (2006), and Cayci and Unal (2007) reported that the majority of the students whose learning styles they studied were assimilators, while Demir (2008) found a majority to be convergers. Metin et al. (2011) identified the majority in their study as accommodators, whereas Cavas (2010) found a majority of divergers. Moreover, while some studies (for example, Kilic 2002; Demir 2008; Senyuva 2009; Bahar and Sulun 2011; Metin et al. 2011) found no significant relationship between the learning styles of undergraduates and their gender, department, and/or achievement, other studies (Ergur 2000; Uzuntiryaki et al. 2004; Cayci and Unal 2007; Bahar et al. 2009; Cavas 2010; Okur et al. 2011) did find such relationships.

Theories of Personality

Modern schools of thought about personality include: (1) psychoanalytic, (2) behavioral, (3) cognitive, (4) humanistic, and (5) the trait perspective. The trait perspective provides the theoretical foundation for this paper, with special emphasis on The Big Five Factor Model of Personality (Costa and McCrae 1992).

The Trait Perspective and the Big Five Factor Model of Personality

Trait is a commonly used term related to descriptive statements about people's general behaviours such as being calm, warm, anxious, or extroverted. The Big Five Factor Model of Personality assumes that human personality is made up of five main domains: neuroticism, extraversion, openness, conscientiousness, and agreeableness (McCrae and John 1990). The neuroticism domain is described as the inclination to such feelings as fear, anger, sadness, embarrassment, guilt, and disgust. Extraversion is described as liking people, being in large groups, being assertive, active, and talkative, and desiring excitement and stimulation. Openness is described as having an active imagination, aesthetic sensitivity, intellectual curiosity, and being attentive to feelings. Agreeableness is described as the tendency to be altruistic, cooperative, and trusting. Conscientiousness is described as the tendency to be purposefully organized, reliable, determined, and ambitious (Major et al. 2006: 928).

The Big Five Factor Model of Personality was chosen for this paper because it measures the

personality construct effectively and provides useful operational definitions (McCrae and Costa 2003). Studies using the construct in educational research have revealed relationships between personality traits and other variables such as gender, department, and GPA. For example, Costa et al. (2001) found a significant relationship between personality traits and gender. Women were found to be more neurotic, agreeable, warm, and open to feelings; men were more assertive and open to ideas. Moldasheva and Mahmood (2014) suggested that conscientious individuals used alternate strategies to learn; whereas Busato et al. (1999) found a significant relationship between the trait of conscientiousness and academic success. Atta et al. (2013) asserted that emotional intelligence was a predictor of personality traits including extraversion, openness, and agreeableness. It was negatively related to neuroticism. In another study, personality trait of neuroticism was found to be associated with lower reasoning in young adults (Graham and Lachman 2014). Rubinstein (2005) in a study with 320 university students reported significant relationships between personality traits, the gender of undergraduates, and their academic department. Ziegler et al. (2014) examined whether the Big Five Personality facets predicted job training performance in various jobs. They found that conscientiousness was a predictor of training performance regardless of the type of job.

Despite the research history of the Big Five Factor Model of Personality elsewhere, few studies have used it in Turkey; and those that have, do not address the relationship between personality traits and gender, department, or achievement. Rather, they have focused on the relationship between personality traits and other psychological factors such as coping. For example, Eksi (2004), in a study with a sample of 261 university students, found significant relationships between neuroticism and dispositional and optimistic situational coping. Ulu (2007), in a study with a sample of 604 university students, investigated adaptive and maladaptive dimensions of perfectionism in relation to adult attachment and Big Five personality traits. Adaptive perfectionism was predicted by measures of conscientiousness, openness, and extraversion.

Relationship between Personality Traits and Learning Styles

Previous research results show that there are individual differences among undergraduates in

terms of their personality traits and learning styles. Using the Big Five personality trait construct, Busato et al. (1999) found relationships between the personality traits and learning styles of 409 first-year psychology students. To identify learning styles they used the Vermunt learning style construct, which consists of meaning-directed, reproduction-directed, application-directed and undirected learning styles. Similarly, Furnham et al. (1999) reported a significant relationship between the personality traits and learning styles of 223 adult participants. Drummond and Stoddard (1992) also discovered a significant relationship between personality traits and learning styles.

METHODS

The present research was conducted in Istanbul in the faculty of education of a state university, which attracts students from all parts of Turkey. The faculty of education has five departments, which, due to confidentiality purposes, are identified here as departments A, B, C, D, and E. Department A has an undergraduate and graduate program in technology in teaching while Department B has an undergraduate program in teaching science. Department C has an undergraduate, graduate, and doctoral program in counselling and teacher training, and Department D has an undergraduate program in pre-school and primary education. Finally, Department E has undergraduate, graduate, and doctoral programs in teaching foreign languages.

Sample

From a population of 801 in the faculty of education, 224 participants were chosen by the process of convenience sampling: from Department A, 18; Department B, 72; Department C, 29; Department D, 64; and Department E: 41. The sample comprised 133 females (59.4 %) and 91 males (40.6%). The average age of the participants was 22, in a range of 18 to 32.

Instruments

Three data collection instruments were used in this paper: (1) The demographic data form was designed by the first author. It gathers personal information such as name, gender, age, and department. (2) Kolb's Learning Style Inventory,

Version II (Kolb 1985), intended for adult learners, is commonly used in research and is easy to administer (Askin 2006). It is a self-description test based on Kolb's experiential learning theory. Composed of 12 situations that record how much a person relies on four modes of learning: concrete experience (CE), reflective observation (RO), abstract conceptualization (AC), and active experimentation (AE) (Kolb 1980). In addition to the scoring of these modes, there are "two combination scores that indicate the extent to which a person emphasizes abstractness over concreteness (AC-CE) and the extent to which a person emphasizes action over reflection (AE-RO)" (Kolb 1980: 68).

The original instrument was found to be reliable, with a Cronbach Alpha coefficient of .82 for the concrete experience scale, .73 for the reflective observation scale, .83 for the abstract conceptualization scale, .78 for the active experimentation scale, .88 for the abstract concrete combination score, and .81 for the active reflective combination. The Turkish adaptation of the inventory was made by Askar and Akkoyunlu (1993) and was found to be reliable, with a Cronbach Alpha of .58 for the concrete experience scale, .70 for the reflective observation scale, .71 for the abstract conceptualization scale, .65 for the active experimentation scale, .77 for the abstract concrete combination score, and .76 for the active reflective combination score.

(3) The Big Five Inventory was developed by John et al. (1991) for the purpose of assessing the five personality dimensions of neuroticism, extraversion, openness, agreeableness, and conscientiousness. It consists of 44 descriptive phrases about oneself, to which one agrees or disagrees. The phrases are based on trait adjectives representative of the Big Five personality traits.

The original instrument was found to be reliable, with a Cronbach Alpha coefficient ranging from .79 to .90. Alkan's (2006) translation into Turkish was used in the paper. She reported .87 alpha reliability for the total scale, and Cronbach alphas ranging from .67 to .89 for the subscales.

Design and Procedure

This quantitative research paper employs a descriptive statistical method to explore the learning styles and personality traits of students and their relation to the variables of gender, depart-

ment, and GPA. Askar and Akkoyunlu, who adapted the Kolb Learning Style Inventory (1993), and Alkan, who adapted the Big Five Inventory (2006), kindly, gave permission to use the Turkish versions of these instruments. Later, permissions were taken from the course instructors to administer the instruments to volunteer students in their classes. The completion of all forms took approximately 20 minutes.

Analysis of Data

Statistical Package for the Social Sciences (SPSS, version 17.0) was used for statistical analysis. Descriptive (frequency, percentage) statistics were used to describe and analyze the learning styles and personality traits of the students, the first aim of the paper. To address the second aim, a one-way Analysis of Variance (ANOVA) was used to analyze the relationship of learning styles and personality traits to GPA, and chi square analysis was used to investigate the distribution of learning styles and personality traits according to gender and department. Chi square

analysis was also used to investigate any occurring relationship between learning styles and personality traits, the third aim of the paper.

RESULTS

The results of the statistical analysis of collected data for this paper are presented in this section. First, the description of students' learning styles and personality traits were investigated. The results of the learning styles of the participants indicated that out of 224 undergraduates, 103 (46%) had the assimilator learning style, 52 (23.2%) the diverger, 50 (22.3%) the converger, and 19 (8.5%) the accommodator. Based on these findings, the majority of the students in this sample had the assimilator learning style. The results of the personality traits of the participants indicated that out of 224 undergraduates, 65 (29%) were found to be agreeable, 53 (23.7%) open, 42 (18.8%) extravert, 33 (14.7%) neurotic, and 31 (13.8%) conscientious. Based on these findings, the majority of the students in this sample had 'agreeable' as the dominant personality trait.

Table 1: Distribution of undergraduates' learning styles according to gender

	Assimilator		Accommodator		Converger		Diverger		Total	
	n	%	n	%	n	%	n	%	n	%
Male	42	46.2	6	6.6	19	20.8	24	26.4	91	100
Female	61	45.9	13	9.7	31	23.3	28	21.1	133	100

Chi-square analysis (p>.05)

Table 2: Distribution of undergraduates' learning styles according to department

	Assimilator		Accommodator		Converger		Diverger		Total	
	n	%	n	%	n	%	n	%	n	%
Department A	7	38.9	0	0	6	33.3	5	27.8	18	100
Department B	43	57.5	4	6	11	17.8	14	18.7	72	100
Department C	11	37.9	2	6.9	10	34.5	6	20.7	29	100
Department D	24	34	7	13	11	19.2	22	33.8	64	100
Department E	18	43.9	6	14.6	12	29.3	5	12.2	41	100

Chi-square analysis (χ^2 : 33.118, p>.05)

Table 3: Distribution of undergraduates' learning styles according to GPA

	Sum of squares	Df	Mean square	F	Sig.
Between groups	.531	3	.177	.731	.534
Within groups	52.033	215	.242		
Total	52.564	218			

One-way ANOVA (F .731 p>.05)

Second, the relationship of learning styles and personality traits to gender, department, and GPA was investigated. As seen in Tables 1, 2 and 3, the results indicate that students' learning styles do not significantly vary according to their gender, department, and GPA. Similarly, as seen in Tables 4, 5, and 6, the results indicate that students' personality traits do not significantly vary according to their gender, department, and GPA.

Finally, the relationship that might exist between the students' learning styles and personality traits was investigated. As seen in Table 7, the results indicated that undergraduates' learning styles did not vary significantly according to their personality traits.

DISCUSSION

This paper investigated (1) the dominant learning styles and personality traits of undergraduates; (2) variation in learning styles and personality traits according to their gender, department, and GPA; and (3) the relationship be-

tween their learning styles and personality traits. It is important for teacher candidates to become aware of their own learning styles. This awareness is both related to how well they learn, and how well they will be able to understand differences in their students' learning (Smith 2002). While tailoring learning experiences to the needs of their students, teacher candidates should consider numerous factors including learning styles, cognitive styles, and personal aspects such as self-efficacy and anxiety while preparing their curriculum and instruction (Park and Lee 2004). Educators' awareness of various learning styles is as important as tailoring the instructional methods to encompass all different learning styles (Sinnerton et al. 2014). The self-report data obtained from the student participants in Goebel and Humphrey's (2014) paper indicated that certain teaching methods were more effective for students with particular learning styles. For instance, case analysis and discussion method was preferred by students who learned intuitively. Akbulut and Cardak (2012) point to Felder's (1996) and Graf's (2007) ideas that if the learning

Table 4: Distribution of undergraduates' personality traits according to gender

	<i>Neuroticism</i>		<i>Extraversion</i>		<i>Openness</i>		<i>Conscientiousness</i>		<i>Agreeableness</i>		<i>Total</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Male	14	15.3	20	22	28	30.8	8	8.8	21	23.1	91	100
Female	19	15.3	22	16.5	25	18.8	23	17.3	44	32.1	133	100

Table 5: Distribution of undergraduates' personality traits according to department

	<i>Neuroticism</i>		<i>Extraversion</i>		<i>Openness</i>		<i>Conscientiousness</i>		<i>Agreeableness</i>		<i>Total</i>	
	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>	<i>n</i>	<i>%</i>
Dept A	1	5.6	4	22.2	7	38.9	4	22.2	2	11.1	18	100
Dept B	12	14.6	15	18.4	18	29.1	8	9.7	19	28.2	72	100
Dept C	3	10.3	7	24.2	8	27.6	2	6.9	9	31	29	100
Dept D	9	15.7	10	15.5	9	13.1	12	16.7	24	39	64	100
Dept E	8	19.5	6	14.6	11	26.8	5	12.3	11	26.8	41	100

Chi-square analysis (χ^2 : 37.359 $p > .05$)

Note: Dept=Department

Chi-square analysis (χ^2 : 8.855 $p > .05$)

Table 6: Distribution of undergraduates' personality traits according to GPA

	<i>Sum of squares</i>	<i>df</i>	<i>Mean square</i>	<i>F</i>	<i>Sig.</i>
Between groups	1.997	4	.499	2.113	.080
Within groups	50.567	214	.236		
Total	52.564	218			

One-way ANOVA (F 2.113 $p > .05$)

styles of learners do not match the instruction given in schools, then they may have learning problems in their academic lives. Therefore, it is quite important to consider learning style differences while preparing curriculum and instruction. They claim that this would make their learning more efficient. Along the same line, Gregory and Chapman (2012) claim that when teachers are sensitive to students' learning preferences, they compose a curriculum that take into consideration the students' weaknesses and strengths. On the other hand, Landrum and McDuffie (2010) suggest that the previous literature does not provide enough evidence to single out learning styles as one of the most important variables in instruction; rather, they assert differentiation and individualization made possible in terms of process, content and product are key to effective instruction.

The results indicated that the dominant learning style of the undergraduates was that of assimilator. The literature explains that the strength of an assimilator is to be interested in ideas and concepts, an appropriate characteristic for this population of future teachers (Felder 1996). There was no significant variation in the undergraduates' learning styles according to gender, department, or GPA. This finding is consistent with previous research that also found no significant relationships (for example, ALQahtani and Al-Gahtani, 2014; Kilic 2002; Demir 2008; Senyuva 2009; Bahar and Sulun 2011; Metin et al. 2011; Torres, 2014). A point warranting discussion is the expectation of a relationship between learning styles and department, since particular learning styles might be suitable for certain academic departments. For example, one might assume that the students in a department with a focus on counselling and teacher training would have the diverger learning style, which is characterized as an interest in people rather than the performance of technical tasks (Kolb 1984). However, in this paper, the dominant learning styles of students in these departments were assimilator (37.9%) and converger (34.5%), traits described as being more interested in ideas than in people, and in technical tasks rather than interpersonal issues (Kolb 1984). Along the same line, it was not surprising to find that the students from the department of science teaching had assimilator learning styles. However, it was surprising that the dominant learning styles of students from the department of counselling and teacher training

and the department of science teaching were the same.

Lack of a significant relationship between students' learning styles and GPA might suggest that the teaching methodology and expectations in the faculty of education did not cause students with one particular learning style to be more successful than those with other learning styles. In other words, the instruction that students received was encompassing; it supported the learning of all students, regardless of learning style.

As for personality traits, a majority of the students had the trait of agreeableness. Agreeable people are characterized as having a tendency to be altruistic, cooperative, and trusting (Major et al. 2006). These characteristics may be appropriate for many occupations such as counsellors, psychologists, and doctors. Similarly, they are certainly appropriate for teachers because the teaching profession requires an altruistic point of view of teachers; and trust and cooperation between students and teachers (Kyrriacou and Coulthard 2000; Kiziltepe 2008). That these future teaching candidates are dominantly agreeable implies to be meaningful.

The distribution of personality traits did not significantly vary according to gender, department, or GPA. Atta et al. (2013) had found gender differences in three dimensions of personality out of the five: conscientiousness, neuroticism, and extraversion. Although the students were majoring in different departments, all were teacher candidates with the single exception of those in counselling, whose future jobs, nevertheless, will have some qualities in common with teaching as they work in school settings. Despite differences in subject matter, the job of teaching combines challenges that require specific personality traits. The finding that there was no difference in the personality traits of students from different departments of teaching was therefore expected.

Finally, the finding that the students' learning styles did not significantly vary according to their personality traits is not consistent with other studies in the literature (Eysenck and Eysenck 1964; Honey and Mumford 1982; Drummond and Stoddard 1992; Jackson and Lewy-Jones 1996; Furnham et al. 1999). At first glance, it seems that there should be a relationship between a person's preferred mode of learning and his or her personality. One reason for the finding

that there was no significant relationship between learning styles and personality traits might be the use of different models and instruments to describe and measure related constructs. Perhaps, also, one's cognitive process and one's personality are two distinct functions.

CONCLUSION

To sum up, the results indicating that all students do not favour the same way of learning and that they do not have the same personality traits suggest that there are individual differences in the learning processes. In addition, the finding that there is no significant relationship between learning styles and personality traits invites the conclusion: One's way of learning is independent of one's personality.

RECOMMENDATIONS

First, regardless of the relationship, a comprehensive educational approach that takes into account both learning styles and personality traits needs to be pursued in educational settings. Pre-service and in-service teachers should consider various learning styles and different traits of their students while preparing their lessons and designing their teaching and learning techniques. Second, this study was conducted in only one faculty of a university. A study including other faculties would yield more information about the role of learning styles in a university education. Further research could elucidate the nature of students' learning styles and the inter-relationship of learning styles with teaching strategies and academic achievement. This kind of a research would help to determine whether or not learning styles when met by appropriate teaching strategies really make a difference in terms of academic achievement.

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