The Effect of Students' Learning Styles to Their Academic Success

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This study was aimed to evaluate the learning styles of education faculty students and to determine the effect of their success and relationship between their learning styles and academic success. The population of this study is comprised of the students of Education Faculty in 19 May University and the sample includes 140: 68 art, 72 pre-school teacher department students. Depending on the results obtained from pre-test, it was aimed to improve students' knowledge and skills in studying. There was a significant difference between the scores of pre- and post-tests. The significant relationship between the scores of post-test and the student success revealed that they learned how to study effectively. The validity and reliability of the test were determined by considering the Cronbach alpha coefficients for each and all of the items. The study has found statistically significant differences between the results of the first and final applications of the subtests on learning styles and academic success; those subtests covered the items as learning, planned study, effective reading, listening, writing, note taking, using the library, getting prepared for and taking exams, class participation and motivation.

Keywords: Study Skills; Learning; Education; Success; Learning Styles

Introduction

It is commonly believed that learning styles are not really concerned with "what" learners learn, but rather "how" they prefer to learn and it is also an important factor for students' academic achievement and attitudes. Students have different strengths and preferences in the ways how they take in and process information which is to say, they have different learning styles. Some prefer to work with concrete information (experimental data, facts) while others are more comfortable with abstractions (symbolic information, theories Mathematical models). It is common to describe and classify unique styles in many domains. For example, there are various architectural styles that may be classified by elements of form, material, time period, and indigenous geographic region. Similarly, there are many distinct literary styles, classified by form, genre, and technique. However, style is not a term that is particularly well-associated with the processes that comprise the complex mechanism of individual learning.

However, recent research suggests that the style by which one learns and applies knowledge is an important characteristic to consider in the aggregate educational processes (Graf, Lin, & Kinshuk, 2008; Kolb & Kolb, 2009; Syler et al., 2006; Thornton, Haskell & Libby, 2006; Zualkernan, Allert, & Qadah, 2006). Acknowledgement of unique learning styles is an attempt to characterize the complex processes by which one acquires knowledge (Kolb, Rubin, & McIntyre, 1974). Learning style may be thought of as a formulation of preconceptions by an individual engaged in the activity of learning (Biggs & Moore, 1993). The Dual Coding Theory for example states that

information is processed through one of two usually independent channels (Beacham et al., 2002).

A learning style is defined as the characteristics, strengths and preferences in the way how people receive and process information (Felder & Silverman, 1988; Allinson & Hayes, 1996; Felder & Brent, 2005; Hsieh et al., 2011). It refers to the fact that every person has his or her own method or set of strategies when learning (Schemeck 1988; ChanLin, 2009; Ford & Chen, 2000; Weinstein, 1996). Learning styles are not dichotomous (black or white, present or absent). Learning styles generally operate on a continuum or on multiple, intersecting continua (Ehrman, 1996; Dunn, 1983; Reid, 1995; McDermott & Beitman, 1984).

There are many debates within the higher education community on how teaching or teaching effectiveness may be defined, for instance, defining effective teaching as "that which produces beneficial and purposeful student learning through the use of appropriate procedures including both teaching and learning in their definition", and defining effective teaching as the "creation of situations in which appropriate learning occurs; shaping those situations is what successful teachers have learned to do effectively". Learning styles are generally considered as characteristic, cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to a learning environment.

Even though there are various definitions of learning styles which are unique and steady, methods of effective learning and information processing are widely accepted (Butler, 1987; Canfield & Canfield, 1988; Keefe, 1991; Weinstein, 1996). A good

strategic learner must understand how to identify their learning goal, integrate the learning style, apply proper skills, and be self-regulated to achieve the best results from learning (Paris & Wingrad, 1990; Zimmerman & Schunk, 2001; Wadsworth, Husman, & Duggan, 2007). Teaching methods also vary. Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of student learning that course. There are consistently high correlations between students' ratings of the "amount learned" in the course and their overall ratings of the teacher and the course. Those who learned more gave their teachers higher ratings. Some instruct lecture, others demon strate or discuss; some focus on principles and others on applications; some emphasize memory and others on understanding. In literature there exist numerous learning styles and learning style models. The differences among definitions and models result from the fact that learning is achieved at different dimensions and that theorists define learning styles by focusing on different aspects (Shuell 1986; Dede, Brown-L'Bahy, Ketelhut, & Whitehouse, 2004; Jensen, 1998). Explaining that "different ways used by individuals to process and organize information or to respond to environmental stimuli refer to their learning styles", defines learning style as a sort of way of thinking, comprehending and processing information. To Kolb (1984), learning style is a method of personal choice to perceive and process information. In this sense, learning style is, on one hand, sensory and, on the other hand, mental. In the 1940s Isabel Briggs Myers developed the Myers-Briggs Type Indicator (MBTI), an instrument that measures, among other things, the degree to which an individual prefers sensing or intuition. In the succeeding decades the MBTI has been given to hundreds of thousands of people and the resulting profiles have been correlated with career preferences and aptitudes, management styles, learning styles, and various behavioral tendencies (Myers, 1980; Kolb, 1984). The complex mental processes by which perceived information is converted into knowledge can be conveniently grouped into two categories: active experimentation and reflective observation. Active experimentation Kolb showed that learning styles could be seen on a continuum running from: 1) concrete experience: being involved in a new experience, 2) reflective observation: watching others or developing observations about own Experience, 3) abstract concept ualization: creating theories to explain observations, 4) active experimentation: using theories to solve problems, and make decisions. Kolb's learning styles gave examples of how one might teach to them: 1) for the concrete experiencer: offer labs, field work, observations or videos, 2) for the reflective observer: use logs, journals or brainstorming, 3) for the abstract conceptualizer: lectures, papers and analogies work well, 4) for the active experimenter: offer simulations, case studies and homework. It involves doing something in the external world with the information to discuss it or explainit or test it in some way and reflective observation involves examining and manipulating the information introspectively. Induction is a reasoning progression that proceeds from particulars (observations, measurements, and data) to generalities (governing rules, laws, and theories). Deduction proceeds in the opposite direction. In induction one infers principles; in deduction one deduces consequences (Friedman & Alley, 1984; Rose, 1998; Dervan & Lawrence, 1982).

Active experimentation involves doing something in the external world with the information to discuss it or explainit or test it in some way and reflective observation involves examin-

ing and manipulating the information introspectively. The simplest and most common form of which involves presenting the information both textually and visually. "Whole brain" learning is known to be a far more effective way to learn. The better connected the two halves of the brain are, the greater the potential of the brain for learning and creativity is. Sequential learners follow linear reasoning processes when solving problems; global learners make intuitive leaps and may be unable to explain how they came up with solutions. Sequential learners can work with material when they understand it partially or superficially, while global learners may have great difficulty to do so. Visual learners remember best what they see: pictures, diagrams, flow charts, time lines, films, and demonstrations. Verbal learners get more out of words: written and spoken explanations. Everyone learns more when information is presented both visually and verbally. Visual learners most effectively process visual information; auditory learners (Whitman & Schwenk, 1984; Miller, 2001) understand best through hearing; and kinesthetic/tactile learners learn through touch and movement. A study conducted by Specific Diagnostic Studies found that 29 percent of all students in elementary and secondary schools are visual learners, 34 percent learn through auditory means, and 37 percent learn best through kinesthetic/tactile modes. Knowledge, attitudes and skills are the content areas needed to produce a well-trained professional. In short, learning style preferences of students cannot be the sole basis for designing instruction, and prescription based on diagnosis must be tentative, varied, monitored, and verified. Project tasks that allow students to use their individual learning styles are not a direct path to higher-order thinking. However, it is possible to create products that reflect shallow and superficial thought. In the mid- to late 1970s, paradigms began to be developed to identify the more external, applied modes of learning styles.

Style refers to a pervasive quality in the learning strategies or the learning behavior of an individual, "a quality that persists though the content may change" (Fischer & Fischer, 1979; Ennis, 2000; Gregorc, 1979; Dale 1969; Diaz & Cartnal, 1999; Smith & Renzulli 1984).

One of the components in the Dunn and Dunn model of learning styles which probably has some biological basis is time-of-day preference.

Indeed, recent research points to a genetic influence, or "clock gene", which is linked to peak alert time. Understanding students' learning styles has been identified as an important element for e-learning development, delivery and instruction, which can lead to improved student performance (Shih & Gamon, 2002; Davidman, 1981; Archer et al., 2003).

A simple awareness of differences in student learning styles is vital for educators in order to aid the learning process. Effective instruction reaches out to all students, not just those with one particular learning style. Students taught entirely with methods antithetical to their learning style may be made too uncomfortable to learn effectively, but they should have at least some exposure to those methods to develop a full range of learning skills and strategies. Most people extract and retain more information from visual presentations than from written or spoken prose.

Generally, a rich data have been obtained through studies on learning styles; however, the data have rarely been exploited by designers of instructional programs thereby a greater understanding of learners' approaches to learning can be obtained.

All information which becomes the subjective life of an individual after giving meaning process may have individual-specific differences in ensuring permanence of learning and remembering. To describe learning styles and to analyze which factors affect learning styles, many studies have been conducted for years. Learners have unique ways of learning, which may greatly affect the learning process and consequently their academic achievement and its outcomes. Learners learn in many ways by seeing and hearing; reflecting and acting; reasoning logically and intuitively; memorizing and visualizing. Researchers drew a distinction between learning styles and strategies focusing on the ways they differ from each other. To teach and learn more effectively, instructors and learners need to better understand and appreciate these individual differences and how they affect the learning process. Learning styles have been extensively discussed in the educational psychology literature Students will learn content better through their preferred learning style. We know that teachers tend to teach in their own preferred learning style. Learning style includes how they approach learning, experience learning and utilize information. Filling in questionnaires and quizzes to determine preferred learning styles can be fun but will not be effective unless they become part of an ongoing program of learning how to learn for students. Learning styles refer to the variations in your ability to accumulate as well as assimilate information. It is quite easy to determine and you may have already had an idea that you might have a particular learning style. In other cases, it may not be quite easy to identify.

Method

Data were collected by applying an evaluation test for studying and learning activities Developed by the researcher, and also by examining student grades. The test includes 106 questions about 10 sub topics covering Learning, Planned study, Effective Reading, Listening, Class Participation, Writing, Using Library, Getting prepared for and Taking Exams, Motivation, Note Taking, The "t-test" was used in order to determine whether there was a difference between test scores in preliminary and final applications of the items involved. A correlation analysis was used to determine the relationship between pre and post test scores in each item and also between these scores and student success.

Participant and Settings: The population of this study is comprised of the students of Ondokuz Mayis University Education Faculty and the sample includes 140: 68 art, 72 pre-school teacher department students. The study protocol was approved by the school administration and the permission was obtained. The students were informed about the purpose and content of the study; they were told that their participation was voluntary and their verbal consent was obtained. This study was aimed to evaluate the learning styles of education faculty students and to determine the effect of their success and relationship between their learning styles and academic success. The validity and reliability of the test was determined by considering the Cronbach Alpha coefficients for each and all of the items. SPSS 15 for windows was used for this purpose. This coefficient was determined for each of the items and these coefficients are illustrated in **Table 1**. Study is limited 140, 68 art, 72 pre-school teacher department students at Ondokuz Mayis University Education Faculty.

Table 1.
Cronbach values for each of the items.

Items	(N = 106)
Learning	0.86
Planned study	0.84
Active reading	0.85
Listening	0.79
Class participation	0.84
Writing	0.89
Using the Library	0.78
Getting Prepared for and Taking the Exam	0.86
Motivation	0.71
Note taking	0.85

Research Results

The test was given to the students at the beginning and the end of the academic year. Findings related to all items are demonstrated in **Table 2**.

140 students who participated in the study had higher mean scores in post-tests and the difference between pre and post test mean scores was statistically significant ($p > 0.05$). A positive relationship was observed between the scores of pre and post tests on sub topics. The relationship between the pre and post-test and grades of the students was examined by correlation analysis. The findings are given in **Table 3**.

According to these results, a positive correlation was found between the scores of post-test on the items of learning, planned study, effective reading and grades while there was weak negative correlation between the scores of pre-tests on the items of learning, planned study, effective reading and grades at the significant level of 0.05. While the correlation between pre-tests scores in the items of listening and note taking and grades wasn't significant, the correlation between the scores of post-test and grades was strongly positive. While there was a weak negative correlation between the scores of pre-tests on the items of class participation, writing, using library, getting prepared for and taking an exam and grades ($r = -0.007$, $r = -0.022$, $r = -0.018$, $r = -0.040$ respectively), the relationship between the scores of posttest and grades was reduced to a very weak negative correlation ($r = -0.300$, $r = -0.008$, $r = 0.034$, $r = -0.086$ respectively).

Conclusion and Discussion

The study has found statistically significant differences between the results of the first and final applications of the subtests on learning styles and academic success; those subtests covered the items of learning, planned study, effective reading, listening, writing, note taking, using the library, getting prepared for and taking exams, class participation and motivation.

The students who did not have study plans or could not follow their plans at the beginning of the term were observed to have a well-planned study program at the end of the term.

In addition to the problem of the complexity of identifying learning styles, Corbett and Smith (1984) discuss the problem of the reliability of such learning style instruments as the Edmonds Learning Style Identification Exercise. Their study

Table 2.
The difference between the pre and post-test.

Items (N = 106)	X	S	t-test	P	r
Learning					
Pre-test	26.80	4.60	−3.98	0.000	0.60
Post-test	28.78	3.12			
Effective Reading					
Pre-test	29.56	7.43	−2.79	0.008	0.70
Post-test	40.90	6.59			
Listening					
Pre-test	27.18	3.80	−4.97	0.000	0.68
Post-test	29.10	4.25			
Class Participation					
Pre-test	18.21	2.76	−7.87	0.000	0.55
Post-test	20.37	3.11			
Using Library					
Pre-test	48.26	6.90	−2.68	0.015	0.70
Post-test	47.88	6.67			
Getting Prepared for and Taking Exams					
Pre-test	23.30	4.01	−5.96	0.000	0.64
Post-test	24.90	3.23			
Motivation					
Pre-test	22.14	5.97	−3.68	0.000	0.58
Post-test	24.05	5.98			
Note Taking					
Pre-test	24.104	4.42	−4.22	0.000	0.74
Post-test	25.54	4.70			
Writing					
Pre-test	21.37	3.98	−3.70	0.000	0.62
Post-test	22.48	3.54			
Planned Study					
Pre-test	24.10	3.60	−4.307	0.000	0.66
Post-test	23.47	3.88			

Table 3.
Correlation between items and grades.

Items (N = 106)	Grader
Learning	
Pre-test	−0.080
Post-test	0.004
Effective Reading	
Pre-test	−0.036
Post-test	0.009
Listening	
Pre-test	−0.030
Post-test	0.076
Class Participation	
Pre-test	0.007
Post-test	0.300
Using Library	
Pre-test	0.018
Post-test	0.034
Getting Prepared for and Taking Exams	
Pre-test	0,040
Post-test	0,086
Motivation	
Pre-test	−0.112
Post-test	−0.107
Note Taking	
Pre-test	−0.048
Post-test	−0.020
Writing	
Pre-test	−0.022
Post-test	−0.008
Planned Study	
Pre-test	0.017
Post-test	0.045

showed that individual variation tended to be consistent and therefore suggestive of external reliability but that group variation lacked consistency and therefore tended to be less reliable tolist three shortcomings of existing self-assessment instruments: 1) The instruments are exclusive (i.e., they focus on certain variables); 2) the students may not self-report accurately; and 3) the students have adapted for so long that they may report on adapted preferences. Finally, McLaughlin (1981), Daniel, Price and Merrifield (2002) studied the effect of learning styles and learning environments on the distance education of students in the department of physiotherapy. Werner (2003) studies the effect of self-awareness about learning styles on the selection of learning strategies and the development of comprehension process. Kolb Learning Styles Inventory was used to identify the learning styles of forty-one adult learners who were observed for six months. The subjects tackled strategies and techniques on the basis of time, keeping the memory, reading, note-taking and decision-making.

The data concerning the learning preferences of subjects were collected through the compositions they wrote. The findings of the study show that the learning types (strategies) preferred according to the learning styles of the subjects were not the appropriate strategies. According to the findings of studies conducted by using the Kolb Learning Style Inventory, learning styles vary depending on individuals' majors (social sciences, natural sciences etc.) and occupations (Kolb, Boyatzis, & Mainemelis, 2001). Kolb, Wolfe, Fry, Bushe and Gish (1981) suggest that there are disciplinary differences in learning styles.

Recommendations

Programs should be designed to improve students' learning styles and learning strategies for all levels to make the teaching and learning process more effective.

It is also recommended that course design should be flexible enough to reach a variety of learning styles. One such example is described by Bates and Leary (2001) which provides a four tier delivery approach whereby the student progresses sequentially through each level based upon their learning needs.

The students should be properly guided and given incentives to select individual learning styles that are appropriate and applicable in their environment for them to achieve their personal academic objective. The students should adopt a suitable learning style that would be beneficial to them.

If distribution of learning styles is similar between students enrolled in both vocational and undergraduate academic programs and if dominant learning style doesn't appear to have a significant effect on academic performance, how can determination of learning style be helpful to the student or instructor?

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