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Journal Editor
Dr. James E. Witte
Auburn University
witteje@auburn.edu
<http://www.learningstyles.org/>

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Table of Contents

A Comparison of Preferred Learning Styles between Vocational and Academic Secondary School Students in Egypt

Asmaa M. El Sayed Makhoulf, Suez Canal University

Maria Martinez Witte, Auburn University

Nafsaniath Fathema, Auburn University

Bayoumi M. Dahawy, Suez Canal University 1

Learning Style Preferences of Student Teachers:

A Cross-Cultural Perspective

Mohamed Sywelem, Suez Canal University

Qassem Al-Harbi, Jazan University

Nafsaniath Fathema, Auburn University

James E. Witte, Auburn University..... 10

A Comparison of Preferred Learning Styles between Vocational and Academic Secondary School Students in Egypt

Asmaa M. El Sayed Makhlouf
Suez Canal University, Egypt

Maria Martinez Witte
Nafsaniath Fathema
Auburn University, AL, USA

Bayoumi M. Dahawy
Suez Canal University, Egypt

Abstract

In recent years, there has been a renewed interest in the dichotomy of vocational education versus general education. This has become a political pronouncement in many countries and has adopted knowledge and skills as the key focus to improve education at all levels (Oketch, 2007). This article is an extension of a comparative study on learning style and method preference of students from vocational and general (academic) secondary schools. The learning style preferences of (461) students in both vocational and academic secondary schools in Egypt are examined using The Steinbach LS Quiz. As the factor of teaching and learning styles play a major role for the students to maximize performance within the classroom.

Introduction

Learning styles are simply different approaches to learning. Each individual has his/her unique way of learning. Learning style greatly affects the learning process, and, therefore, the outcome (Carver, Howard, & Lane, 1999; Vincent & Ross, 2001). Stellwagen (2001) argued that flexible combinations of learning and teaching styles allow all students to develop effective ways of gaining positive educational outcomes. The topic of learning styles and its effect on student performance have been extensively examined in the educational research literature (Felder & Henriques, 1995), specifically in the context of differences in student learning styles by Felder and Brent (2005). Many learning style assessment instruments have been developed in the past five decades (Felder & Henriques, 1995).

Chan (2001) described that the assessment of students' preferences for specific learning styles is basically to help teachers employ strategies that are congruent with students' preferences in order to maximize the learning outcomes of students. Teachers

who taught with learning styles as a basis adapted themselves more often to students' learning preferences, cooperated and reflected more with colleagues, were more development-oriented and more open to change compared with those who did not use learning styles as a pedagogical basis (Boström, 2011).

Purpose of the Study

According to Griggs (1984), the correct learning style is important because it can help to increase the academic performances of the students. Therefore; this study has been conducted in order to reveal the learning style preferences of secondary school students in both academic and vocational education. This study further examined the relationship of gender and learning style among the population of interest. The method of teaching and learning plays a major role in students to performance and success can be achieved if students and teachers employ appropriate learning styles.

Research Questions

This research is to identify the learning style preferences between vocational and academic secondary school students in Egypt. The research questions are as follows:

1. What are the learning styles preferences between Vocational and Academic Secondary School Students in Egypt?
2. Are there any differences between Vocational and Academic Secondary School Students in relation to learning style preferences?
3. What is the relationship between students' gender and learning style preferences in both academic and vocational secondary schools?

Research Objectives

The objectives of this research are as follows:

1. To identify learning styles preferences between Vocational and Academic Secondary School Students in Egypt.
2. To identify whether there are differences between Vocational and Academic Secondary School Students in Egypt in relation to learning style preferences.
3. To identify whether there is a relationship between students' gender and their learning style preferences in both academic and vocational secondary schools.

Review of Literature

Learning style refers to simple preference for the method by which we learn and remember what we learned; show us the way and how we learn; involve that the subjects are processing the information in different ways, involving cognitive part, the

affective emotional elements, psychomotor and some learning situation characteristics. Researchers such as (Dunn, Griggs, & Price, 1993; Park, 1997; Restak, 1979) also found gender differences in their studies of learning styles.

Assessing an individual's learning style is vital to the teaching and learning process. Most education research has confirmed that knowledge of student learning preferences do yield benefits, for example, Diaz and Cartnal (1999) compared the student learning styles of two online health education classes ($N = 68$) with an equivalent on-campus class ($N = 40$). They found significant differences in learning preferences for both group of students and concluded that knowledge of student learning preferences influenced learning performance. Felder and Silverman (1988) and Felder and Dietz (2002) also examined effects of learning and teaching styles in engineering education. They found that knowledge of students learning preferences were a determinant of student success.

Dunn (1992) has also offered the following mission statements to assure that every person has the opportunity to learn:

1. Individual learning styles should be acknowledged and respected.
2. Individual information processing is fundamental to a learning style and can be strengthened over time with intervention.
3. Learning style is a complex construct for which a comprehensive understanding is evolving.
4. Learners are empowered by knowledge of their own and others' learning styles.
5. Effective curriculum and instruction are learning-style based and personalized to address and honor diversity.
6. Effective teachers continually monitor activities to ensure compatibility of instruction and evaluation with each individual's learning style strengths.
7. Teaching individuals through their learning style strengths improves their achievement, self-esteem, and attitude toward learning.
8. Every individual is entitled to counseling and instruction that responds to his/her style of learning.
9. A viable learning style model must be grounded in theoretical and applied research, periodically evaluated, and adapted to reflect the developing knowledge base.
10. Implementation of learning style practices must adhere to accepted standards of ethics.

Definition of learning style

The term learning styles refers to the view that people learn information in different ways. The variety of concepts found on learning styles literature makes it, nevertheless, difficult to build a unified framework.

Learning style is a biologically and developmentally imposed set of personal characteristics that make the same teaching (and learning) methods effective for some and ineffective for others. According to Keefe (1979), learning styles generally refer to cognitive, affective, and physiological behaviors that perform as relatively stable indicators of how people perceive, interplay with, and respond to their environment in learning situations.

Learning involves the totality of human activities: feeling, reflecting, thinking, and doing (Kolb, 1984). Cano (2005) pointed out learning styles deployed by students may well reflect the quality of the education they are receiving. Learning styles are usually described as the cognitive, affective, and physiological traits that students exhibit as they interact in the classroom environment.

Some consider learning styles are related to individual methods and strategies of information processing (Reid, 1995). Additionally, Haar, Hall, Schoepp, and Smith (2002) also elaborated learning styles as individual's differences in which information is perceived, processed, and communicated.

Secondary (High) Schools in Egypt

Secondary education reform in Egypt in the 1990s is consistent with the country's historical background in both its economic and social dimensions. Since the 1952 revolution, Egypt pursued economic policies based on state intervention, centralized decision-making, public sector dominance of industrial production, import substitution and a highly regulated system of controls on private economic activity. The education system as a whole expanded rapidly, especially in the secondary and university subsectors. All levels of education (primary, preparatory, secondary, and higher education) were offered free of charge. Moreover, in 1964, the government guaranteed a government job to any university graduate (Richards, 1992).

Secondary education has crucial importance in the Egyptian education structure because its graduates compete for university admission or for work. During the 1980s secondary education was structured in three broad types: 1) a three-year general or academic program; 2) three or five-year vocational and technical programs; and 3) a five-year primary teacher training program (Clementina, 2002).

According to the structure of the education system in Egypt, graduates of general secondary schools may go to the university, while graduates of technical secondary schools may only go to non-university higher and middle institutes or to the job market. Generally, less than 5% of the technical school graduates are admitted to the universities (Wilcox, 1988; World Bank, 1999); while, more than 80% of the general secondary school graduates enter the universities (Clementina, 2002).

Table 1

Structure of the Educational System in Egypt

Age	Grade	Level			
22	17	Universities	Non-Universities		
21	16		Higher and Middle Institutes		
20	15		Technical Secondary School (5 Year)		
19	14				
18	13				
17	12	General Secondary School	Technical Secondary School (3 Year)		
16	11				
15	10				
14	9	(Basic) Preparatory			
13	8				
12	7				
11	6	(Basic) Primary			
10	5				
9	4				
8	3				
7	2				
6	1				
3, 4, 5		Pre-Primary			

Source: Case Studies in Secondary Education Reform: Improving Educational Quality (IEQ) Project, American Institutes for Research (Clementina, 2002)

Methods

The Steinbach LS Survey was translated into Arabic. This Arabic version was constructed in the same format as the English version, and was given to two language experts for back translation. A corrected final version of the survey was administered to High School students in both academic and vocational schools in Egypt. The Steinbach LS survey, consisted of (12) statements with forced choice items with two options (yes, no). The participants are expected to select the appropriate choice for each statement. The researchers designed a survey to collect demographic information from the learners. Demographic data consisted of Education (vocational & academic) and gender (male & female).

Participant Selection

This research focuses on secondary (high) school students in both academic and vocational education. The participants in this study were selected from secondary (high) schools in Ismailia and Suez Governorates. The research focuses on 3rd year high school students in both vocational and academic schools. The participants in this study, 441 students, represent a convenience sample of Egyptian students.

Data Analysis

The descriptive statistics show a total of 441 students (161 males and 280 females) participated in the survey. Out of them, 261 students were Academic secondary schools students and 180 were Vocational secondary schools students.

A two way multivariate analysis of variance (MANOVA) was conducted to examine the relationship of gender and types of education on three different learning styles (Auditory, Visual and Kinesthetic). The Box's M test was not statistically significant and indicates that homogeneity of variance-covariance assumptions is not violated, $F(18, 332516.580) = 1.180, p = 0.267$, so the Wilks' Lambda test statistic is used in interpreting the MANOVA results. Factor interaction was examined and it was statistically significant, $[F(3,435) = 5.793, p = .001, \eta^2 = .038]$, however, the multivariate effect size was small. The Levene's tests of equality of error variances for Kinesthetic learning style was statistically significant with a value of .002 and indicated equality of variance assumption was violated. However, the Levene's tests for the other two dependent variables (Auditory and Visual learning styles) were not statistically significant with values of .469 and .678 for Auditory learning style for Visual learning style respectively, which indicated that the variances were fairly equivalent between the groups.

Prior to examining the univariate ANOVA results, the alpha level was adjusted to $\alpha = 0.025$ because two dependent variables were analyzed. Univariate ANOVA results indicated that there is a statistically significant interaction effect of gender and education on Kinesthetic learning style $[F(1,437) = 15.513, p = .000, \text{partial } \eta^2 = .034]$. The effect size was small. No significant difference was found in Auditory and Visual learning abilities across male and female students or across Academic secondary schools students and Vocational school students. However significant results were found for Kinesthetic learning ability.

The main effect of school type yielded an F ratio of $F(1, 259) = 9.546, p = .002$, indicating that in Academic secondary schools, the Kinesthetic learning ability of male students was significantly higher ($M = 7.01, SD = 1.04$) than that of the female students ($M = 6.60, SD = .912$). However for Vocational schools an F ratio of $F(1, 178) = 6.268, p = .013$ indicated that the female students had higher Kinesthetic learning ability ($M = 6.93, SD = .858$) than male students ($M = 6.57, SD = 1.03$).

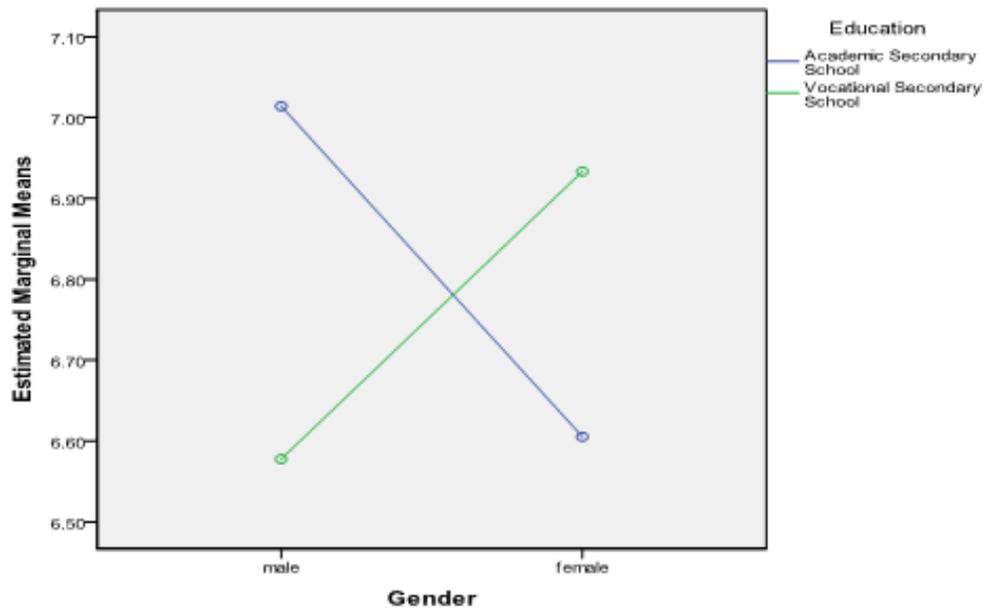


Figure 1: Kinesthetic Learning in Academic and Vocational secondary schools

Findings

No statistical differences were found among the Auditory, Visual and Kinesthetic learning modalities. The researchers had anticipated a strong representation of kinesthetic learners within the vocational population; however, this was not the case. Data indicated that the Kinesthetic preference was higher among males in academic programs of study than for females in the same program. Within the vocational settings females had higher kinesthetic preference than the males. No gender-based differences were found. As a result of these findings, further research is recommended in these areas.

References

- Boström, L. (2011). Students' learning styles compared with their teachers' learning styles in secondary schools. *Institute for Learning Styles Journal*, 1, 17-38.
- Cano, F. (2005). Epistemological beliefs and approaches to learning: Their change through secondary school and their influence on academic performance. *British Journal of Educational Psychology*, 75(2), 203-221.
- Carver, C. A., Howard, R. A., & Lane, W. D (1999). Enhancing student learning through hypermedia courseware and incorporation of student learning styles. *IEEE Transactions on Education*, 42(1), 33-38.

- Chan, D. W. (2001). Learning styles of gifted and non-gifted secondary students in Hong-Kong. *Gifted Children Quarterly*, 45(1), 35-44.
- Clementina, A. (2002). Case Studies in Secondary Education Reform: Improving Educational Quality (IEQ) Project, American Institutes for Research..
- Diaz, D. P., & Cartnal, R. B. (1999). Comparing student learning styles in an online distance learning class and an equivalent on-campus class. *College Teaching*, 47(4), 130-135.
- Dunn, R. (1992). Learning styles network mission and belief statements adopted. *Learning Styles Network Newsletter*, 13(2), 1.
- Dunn, R., Beaudry, J. S., & Klavas, A. (1989). Survey of research on learning styles. *Educational Leadership*, 46(6), 50-58.
- Dunn, R., Griggs, S., & Price, G. E. (1993). Learning styles of Mexican American and Anglo-American elementary students. *Journal of Multicultural Counseling and Development*, 21(4), 237-247.
- Felder, R. M., & Brent, R. (2005). Understanding student differences. *Journal of Engineering Education*, 94(1), 57-52.
- Felder, R. M., & Dietz, E. J. (2002). The effects of personality type on Engineering student performance and attitudes. *Journal of Engineering Education*, 91(1), 3-17.
- Felder, R. M., & Henriques, E. R. (1995). Learning and teaching styles in foreign and second language. *Foreign Language Annals*, 28(1), 21-31.
- Felder, R. M., & Silverman, L. K. (1988). Learning and teaching styles In Engineering education. *Engineering*, 78(7), 674-681.
- Griggs, S. A. (1984). Selected case studies at preferences of gifted students. *Gifted Quarterly*, 28(3), 115-119.
- Haar, J., Hall, G., Schoepp, P., & Smith, D. H. (2002). How teachers teach to students with different learning styles. *The Clearing House*, 75(3), 142-145.
- Keefe, J. W. (1979). Learning style: an overview. In J.W. Keefe (ed.), *Student Learning Styles: Diagnosing and Prescribing Programs* (pp. 1-17). National Association of Secondary School Principals: Reston.

- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Englewood Cliffs, NJ: Prentice-Hall.
- Oketch, M. (2007). To vocationalise or not to vocationalise? Perspectives on current trends and issues in technical and vocational education and training (TVET) in Africa. *International Journal of Educational Development*, 27(2), 220-234.
- Park, C. C. (1997). Learning style preferences of Korean, Mexican, Armenian-American and Anglo students in secondary schools. *National Association of Secondary School Principals (NAASP) Bulletin*, 81(585), 103-111.
- Reid, J. M. (1995). *Learning styles in the ESL/EFL classroom*. Florence, KY: Heinle & Heinle Publishers.
- Restak, R. M. (1979). The other difference between boys and girls. In *Student learning styles: Diagnosing and prescribing programs* (pp. 75-80). Reston, VA: National Association of Secondary School Principals.
- Richards. A. (1992). *Higher education in Egypt*. World Bank Working Paper.
- Stellwagen, J. B. (2001). A challenge to the learning style advocates. *Clearing House*, 74 (5), 265-268.
- Vincent, A., & Ross, D. (2001). Personalized training: Determine learning styles, personality types and multiple intelligence online. *The Learning Organization*, 8(1), 36-43.
- Wilcox, L. (1988). *Arab Republic of Egypt: A study of the educational system of the Arab Republic of Egypt and a guide to academic placement of students in educational institutions of the United States*. Washington, DC: World Education.
- World Bank. (1999). *Secondary education enhancement project in Egypt*. Project Appraisal. Retrieved from <http://web.worldbank.org/external/projects/main?menuPK=228424&theSitePK=40941&pagePK=64283627&piPK=73230&Projectid=P050484>

Author's Notes

Dr. Asmaa M. El Sayed Makhoulf, Suez Canal University, Egypt
 Dr. Maria Martinez Witte, Auburn University, Alabama, USA
 Nafsaniath Fathema MBA, Auburn University, Alabama, USA
 Dr. Bayoumi M. Dahawy, Suez Canal University, Egypt

Learning Style Preferences of Student Teachers: A Cross-Cultural Perspective

Mohamed Sywelem
Suez Canal University, Egypt

Qassem Al-Harbi
Jazan University, KSA

Nafsaniath Fathema
James E. Witte
Auburn University, AL, USA

Abstract

All students learn, but not all learn in the same way. Educational researchers postulate that everyone has a learning style. This article examines how cultural variability is reflected in the learning style of students in Egypt, Saudi Arabia and United States. In this study, the learning styles of over 300 students in Teacher Education Institutions in Egypt; Saudi Arabia and United States of America were examined with What's My Learning Style? Instrument developed by Steinbach (1993).

Introduction

Each person has his or her own individual way of gathering and processing information, and solving problems in day-to-day situations. These personal cognitive abilities, acquired in the course of a long socialization process are called "learning styles" (Reynolds, 1997). Riding (2005) assured that students are not all the same and that individual differences influence both their learning and their academic achievement.

Knowledge of one's learning style can lead to enhanced learning and helps the learner focus on improving weaker points. Learning styles analysis is also useful for informing the teaching and learning process and can be used as a tool to enhance achievement and inclusion (DFES, 2004; Rose & Nicholl, 1997).

How we learn is influenced by culture. As cultures are different, it's natural to expect differences in the styles of learning in different countries. Previous studies (Katz, 1988; Pratt, 1992) suggest that University students' learning styles differ across cultures because of the constraints that various cultures place on the behavioral patterns of

people. The perspective that there is a relationship between learning styles and culture is not new and has been discussed in scholarly research for a few decades. Some cross-cultural research has revealed that certain ethnic groups have learning styles that are distinct from those of other ethnic groups (Dunn & Griggs, 1990; Jacobs, 1987; Jalali, 1989; Sims, 1988; Williams, 1990). This study concentrates on a theoretical and empirical comparative-analysis between the learning styles and cultural typologies presented in three countries: Egypt, Saudi Arabia and United States.

Review of Literature

Many different learning styles/preferences and definitions of learning styles exist in the literature. Learning style is an ongoing issue of great importance to educational research.

Researchers recognized that different learners had different cognitive styles and habitual information-processing strategies that determine a learner's typical mode of perceiving, remembering, thinking, and problem solving (Messick, 1976). In examining learning styles of college students in various disciplines Canfield (1988) reported significant differences among groups of students enrolled in various majors in collegiate settings.

Kolb (1984) described learning as a four-stage process consisting of concrete experience, observation and reflection, formation of abstract concepts and generalizations and the testing of the implications of these concepts in new situations. Different learners may start at different phases of the cycle. Some individuals integrate and use all four learning modes; for others, some learning modes will come to redominate. For this reason, every human being develops a specific learning style (see Figure 1).

According to Kolb's learning styles, learners can thus be classified into one of four learning styles, namely, converger, diverger, assimilator, and accommodator, mapped in one of the four quadrants (Kolb, 1985).

- ❖ *Convergers* combine AC and AE. Convergers are best at finding practical use to theories and ideas and are good at solving problems and making decisions. Kolb suggests they prefer dealing with technical tasks than with social and interpersonal issues.
- ❖ *Divergers* combine CE and RO. Divergers are best at viewing concrete situations from different points of view, they prefer brainstorming situations to taking action.

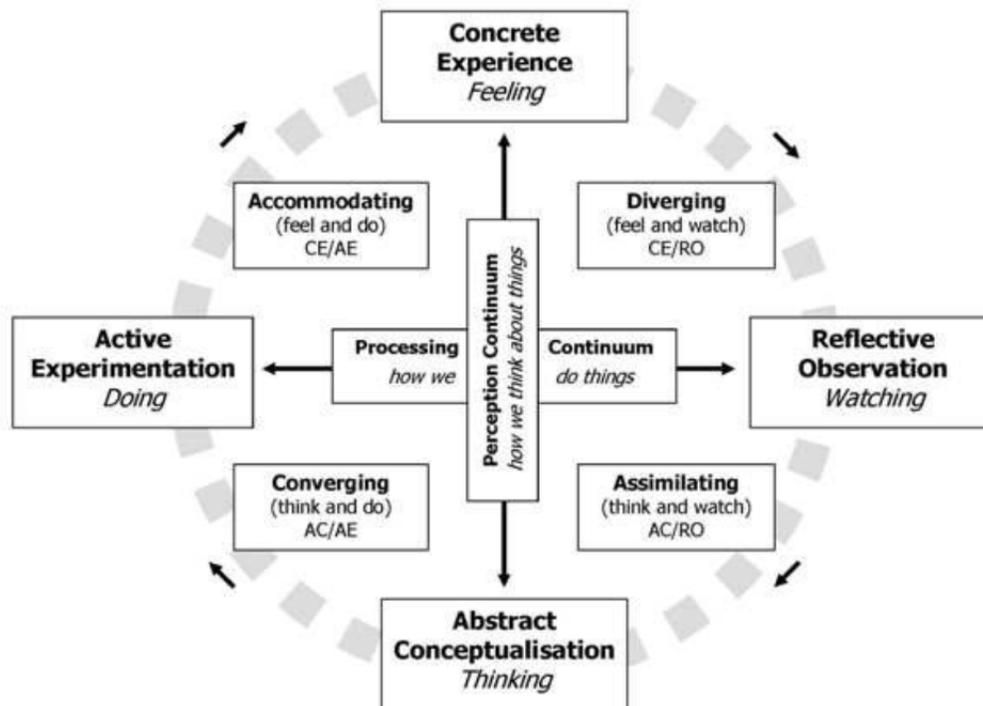


Figure 1. Kolb's Learning Styles

- ❖ *Assimilators* are learners who combine AC and RO. Assimilators are best at understanding a wide range of information and organizing them into concise, logical form. They are more interested in abstract ideas and concepts rather than people. They value more of the logical soundness of a theory than its practical value.
- ❖ *Accommodators* are learners who combine the learning steps of CE and AE. Accommodators learn primarily from 'hands-on' experience. They prefer to act on feelings rather than on logical analysis. In solving problems, they rely more heavily on people for information than on their own technical analysis.

Various families of learning styles have been developed. There may be encountered four basic types of approaches for identifying different learning styles (Sadler-Smith, 1997):

1. learning styles presenting personal cognitive characteristics about dependence or independence in given area;
2. styles dealing with specific learning preferences;
3. approaches combining elements of cognitive and personal learning preferences;

- styles determined by ways of processing information - based on the cyclical model of (Kolb, 1984) for converger, diverger, accommodator, and assimilator styles.

Learning styles, however, is an umbrella concept bringing together various schools of thought (Butler, 1986) which share the belief that students learn best when they are given the opportunity to learn, deal with information, and communicate in a manner that they feel most comfortable with (Pallof & Pratt, 2003). As a result, diverse models have been developed to explain these individual differences in learning. Coffield, Moseley, Hall and Ecclestone (2004) developed a continuum of five 'families' into which any particular learning style model can be identified. Along this continuum, the learning style families are scaled from the greatest to least degree to which the belief that learning styles are relatively fixed individual characteristics has influenced the model's development (see Figure 2).

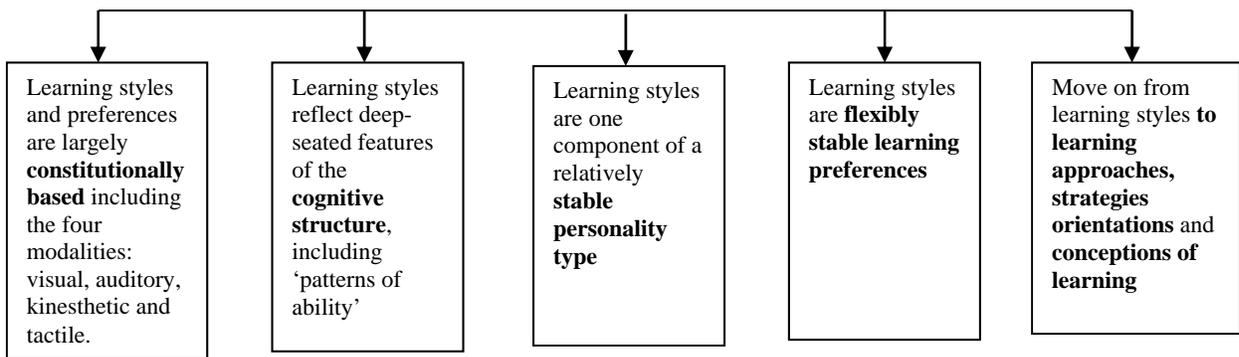


Figure 2. Family of Learning Styles

Definition of learning style

Researchers have made efforts to define and categorize learning styles in different ways, such as:

- The “characteristic, cognitive, affective, and psychological behaviors that serve as relatively stable indicators of how learners perceive, interact with, and respond to a learning environment” (Keefe, 1979, p. 4).
- A predisposition to adopt a particular learning strategy which involves a particular pattern of information processing activities (Schmeck, 1983).
- The “modes of perceiving, remembering, thinking, problem solving, and decision making, reflective of information-processing regularities that develop in congenial ways around underlying personality trends” (Messick, 1994, p. 122).
- The “learners’ natural, habitual, and preferred ways of absorbing, processing, and retaining new information and skills which persist regardless of teaching methods or content area” (Kinsella, 1995, p. 171).

- The unique collection of individual skills and preferences that affect how a student perceives, gathers, and process learning materials (Johnson & Orwig, 1998).
- The “individual consistencies in perception, memory, thinking, and judgment across any stimulus condition” (Curry, 2000, p. 239).
- The “individual’s preferred ways of gathering, organizing, and thinking about information” (Fleming, 2001, p. 1).

Thus; The term ‘learning styles’ has no one definition – in much of the literature it is used loosely and often interchangeably with terms such as ‘thinking styles’, ‘cognitive styles’ and ‘learning modalities’.

Learning style and culture

So far, there have been only a comparatively small number of studies analyzing learning styles across cultures. Culture may be related to the development of learning styles. Hofstede (2001) defined Culture as “the collective programming of the mind which distinguishes the members of one human group from another”. Irrespective of the discipline, the scholars have come to more or less a common ground with respect to defining culture. Culture can be conceptualized as “shared motives, values, beliefs, identities, and interpretations or meanings of significant events that result from common experiences of members of collectives that are transmitted across generations” (House, Hanges, Javidan, Dorfman, & Gupta, 2004, p. 15).

Individuals are the product of their cultural background and experiences, several studies have assumed that an individual’s preferred learning style will depend on his or her cultural background. Hofstede (1997) argues that a country’s culture shapes its peoples’ preferred modes of learning through their socialization experiences. Hyland (1993) assures that learning style is affected by individual differences such as gender, academic and cultural background. Culture acts as a strong socialization agent (Barmeyer 2004; Hayes & Allinson, 1988) that influences information processing and cognition (Earley & Ang, 2003). Thus there is reason to believe that the differences in cultural socialization tend to influence learning preferences. Pratt (1992) argues that learning styles may vary from culture to culture. Hayes and Allinson (1988) suggest that the culture of a country may be one of the powerful socialization agents that have a great impact upon the development of learning styles.

Research has identified cultural differences in the learning styles of various ethnic groups. Reid (1987) conducted a comparative study of college students learning English as a second language and reported that there were significant cultural differences in visual, auditory, kinesthetic, tactile, group, and individual learning styles among Korean, Chinese, Japanese, Malay, Arabic, and Spanish students. Park (1997) conducted a comparative study of Chinese, Filipino, Korean, Vietnamese, and Anglo

students in secondary schools and concluded that Korean, Chinese, and Filipino students were more visual than Anglos and that Korean, Chinese, and Anglo students showed negative preferences for group learning while Vietnamese showed a major preference and Filipino students showed a minor preference.

Joy and Kolb (2007) concluded that culture has an impact on the learning style scales that is comparable to that of some of the demographic variables. Culture has a significant effect in deciding a person's preference for Abstract Conceptualization vs. Concrete Experience.

Thus, culture has the ability to shape the ways in which its members receive, process and act on information and experience, shaping the particular way they learn from experience.

Methods

Preparation of the Instrument

For the Arab students, The Steinbach Learning Style Survey was translated into Arabic. This Arabic version was constructed in the same format as the English version, and was given to two language experts for back translation. A corrected final version of the survey was administered to a group of student teachers in Saudi Arabia and Egypt. The Saudi students group was selected from Jazan University, and the Egyptian group was selected from Suez Canal University.

The Steinbach LS survey, consisting of (12) statements with forced choice items with two options (yes, no), was used to gather data. The participants were expected to select the appropriate choice for each statement. Researcher designed demographic information was used to examine two variables. Demographic data consisted of place (country) and gender (male and female).

An estimate of Validity was established using a Q-sort Technique. When using this technique "An individual is given a set of items or statements, usually on cards, and asked to place them into specific categories so that each category contains some minimum of cards" (Gay, 1980, p. 121).

A five person panel was established using a convenience sample of two doctoral level, one graduate student and two undergraduate level participants. Each participant was presented with an envelope containing three header cards labeled: Auditory, Visual and Kinesthetic, in keeping with the three domains the instrument purports to measure. The envelope also contained the instrument's 12 questions on individual slips of paper. The panel members were requested to array the header cards in front of them

and place appropriate question with each header card. Upon completion responses were paper clipped to the header card and returned to the envelope.

The resulting products were reviewed for a percent agreement with the instruments scoring standards. Results of the percent agreement are shown in Table 3 below.

Table 1

Card Sort Results

Scorer	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
#1	X	X	X	X	X	X	X	X	X	X	X	X
#2	X	X	X	X	X	X	X	X	X	X	X	X
#3	X	X	X	X	X	X	X	X	X	X	X	X
#4	X	X	X	X	X	X	X	X	X	X	X	X
#5	X	X	X	X	X	X	X	X	X	X	X	X

Note: X= scorer agreement
 0 = lack of agreement

As a result of the Q-Sort Review, an estimate of validity for the What's my Learning Style? Instrument was considered to be appropriate for research purposes.

Participants

The descriptive statistics shows out of the total 316 respondents, 118 (37.3%) were American students, 94 (29.7%) were Saudi students and 104 (32.9%) were Egyptian students. 208 (65.8%) of the total respondents were males and 108 (34.2%) were females.

Table 2

Demographics

Nationality	Male	Female	Total	Percent
American	35	83	118	37.3%
Saudi	94	0	94	29.7%
Egyptian	39	25	104	32.9%
Total	208	108	316	100%

Results

Auditory Learning ability

The descriptive table shows the descriptive statistics including the mean, standard deviation for each separate group (Egyptian students, Saudi students and American students) as well as for the total respondents when all groups are combined (Total).

Table 3

Descriptive Statistics (Auditory Learning Ability)

	Respondents	Mean Score	SD
Egyptian student	104	6.3942	.96962
Saudi student	94	6.9362	.81397
American student	118	6.3814	.96891
Total	316	6.5506	.95650

The Levene's F Statistic shows a significant value of 0.003 and, therefore, the assumption of homogeneity of variance is not met.

Table 4

Homogeneity of Variance Test

Levene's Statistics	df1	df2	Sig
6.086	2	313	.003

So, the Robust Tests of Equality of Means Table instead of the ANOVA Table was used to determine the group differences among the three different groups of respondents.

Table 5

Robust Tests of Equality of Means

	Statistic ^a	df1	df2	Sig
Welch	13.312	2	207.234	.000

^aAsymptotically F distributed

The robust tests of equality of means table shows, there was a statistically significant difference between groups as determined by one-way ANOVA Welch (2,207.234) = 13.312, $p < 0.01$). A Games-Howell post-hoc test revealed that the Saudi students have statistically significantly higher ($6.93 \pm .813$, $p < 0.01$) auditory learning ability compared to Egyptian students ($6.39 \pm .969$) and American students ($6.38 \pm .956$). There were no statistically significant differences in the auditory learning ability between the Egyptian and American students ($p = .994$).

Visual Learning ability

The descriptive table shows the descriptive statistics including the mean, standard deviation and 95% confidence intervals for the dependent variable (Time) for each separate group (Egyptian students, Saudi students and American students) as well as for the total respondents when all groups are combined (Total).

Table 6

Descriptive Statistics (Visual Learning Ability)

	Respondents	Mean Score	SD
Egyptian student	104	6.6538	.91130
Saudi student	94	6.7766	.89388
American student	118	6.8814	.84524
Total	316	6.7753	.84524

The Levene's F Statistic shows a significant value of 0.008 and, therefore, the assumption of homogeneity of variance is not met.

Table 7

Homogeneity of Variance Test

Levene's Statistics	df1	df2	Sig
4.875	2	313	.008

So, the Robust Tests of Equality of Means Table instead of the ANOVA Table was used to determine the group differences among the three different groups of respondents.

Table 8

Robust Tests of Equality of Means

	Statistic ^a	df1	df2	Sig
Welch	2.086	2	197.373	.127

^aAsymptotically F distributed

The robust tests of equality of means table shows, there was no statistically significant difference in the visual learning abilities among the American, Egyptian and Saudi students as determined by one-way ANOVA Welch (2,197.373) = 2.086, p =.127).

Kinesthetic Learning ability

The descriptive table shows the descriptive statistics including the mean, standard deviation and 95% confidence intervals for the dependent variable (Time) for each separate group (Egyptian students, Saudi students and American students) as well as for the total respondents when all groups are combined (Total).

Table 9

Descriptive Statistics (Kinesthetic Learning Ability)

	Respondents	Mean Score	SD
Egyptian student	104	6.8558	.94938
Saudi student	94	6.9468	.90835
American student	118	6.0254	1.2453
Total	316	6.5728	1.13714

Homogeneity of Variances Table

The Levene's F Statistic shows a significant value of 0.001 and, therefore, the assumption of homogeneity of variance is not met.

Table 10

Homogeneity of Variance Test

Levene's Statistics	df1	df2	Sig
7.055	2	313	.001

So, the Robust Tests of Equality of Means Table instead of the ANOVA Table was used to determine the group differences among the three different groups of respondents.

Table 11

Robust Tests of Equality of Means

	Statistic ^a	df1	df2	Sig
Welch	22.114	2	208.273	.000

^aAsymptotically F distributed

The robust tests of equality of means table shows, there was a statistically significant difference between groups as determined by one-way ANOVA Welch (2,208.273) = 22.114, $p < 0.01$). A Games-Howell post-hoc test revealed that the American Students have statistically significantly lower ($6.02 \pm .1.24$, $p < 0.01$) Kinesthetic learning ability compared to Egyptian students ($6.85 \pm .949$) and Saudi students ($6.94 \pm .908$). There were no statistically significant differences in Kinesthetic learning ability between the Egyptian and Saudi students ($p = .770$).

Conclusions / Recommendations

Analysis of the data leads us to the following conclusions/recommendations:

1. With no statically differences found concerning the Visual Modality preference common classroom practice regarding visual aids to learning should be beneficial to all three nationalities.
2. Saudi students demonstrated a preference for the Aural Modality, therefore a higher level of lecture among Saudi students than the other nationalities would be appropriate to support their expressed learning preferences.

3. Lastly, the American students were significantly less inclined to select the Kinesthetic Modality than the students from the other nations. As a result the data indicate that less emphasis on the Kinesthetic Modality for American students than the other nationalities would be an appropriate classroom strategy.

References

- Barmeyer, C. I. (2004). Learning styles and their impact on cross-cultural training: An international comparison in France, Germany and Quebec. *International Journal of Intercultural Relations*, 28, 577-594.
- Butler, K. A. (1986). *Learning and teaching style in theory and practice*. Melbourne: Hawker Brownlow Education.
- Canfield, A. (1988). *Learning Styles Inventory Manual*. Western Psychological Services, Los Angeles, CA.
- Coffield, F., Moseley, D., Hall, E. & Ecclestone, K. (Eds.). (2004). *Learning styles and pedagogy in post-16 learning: A systematic and critical review*. Wiltshire: Learning and Skills Research Centre.
- Curry, L. (2000). Review of learning style, studying approach, and instructional preference research in medical education. In R. J. Riding, & S. G. Rayner (Eds.), *International perspectives on individual differences*, 4. Stamford, CT: Ablex Publishing.
- DFES (2004). *Pedagogy and practice: Teaching and learning in secondary schools: Unit 19: Learning styles*. London: Department for Education and Skills.
- Dunn, R., & Griggs, S. A. (1990). Research on the learning style characteristics of selected racial and ethnic groups. *Journal of Reading, Writing, and Learning Disabilities*, 6(5), 261-280.
- Earley, C., & Ang, S. (2003). *Cultural intelligence: Individual interactions across cultures*. Stanford, Palo Alto, CA.
- Fleming, N. (2001). *Teaching and learning styles: VARK strategies*. Christchurch, New Zealand.
- Hayes, J., & Allinson, C. W. (1988). Cultural differences in the learning styles of managers. *Management International Review*, 28, 75-80.

- Hofstede, G. (2001). *Culture's consequences* (2nd ed.). Thousand Oaks, CA: Sage Publications, Inc.
- Hofstede, G. (1997). *Culture and organization: Software of mind*. New York, NY: McGraw-Hill.
- House, R. J., Hanges, P. J., Javidan, M., Dorfman, P. W., Gupta, V. (2004). *Culture, Leadership and Organizations: The GLOBE Study of 62 Societies*. Sage Publications, Inc.
- Hyland, K. (1993). Culture and learning: A study of the learning style preferences of Japanese students. *RELC Journal*, 24(2), 69-91.
- Gay, L. R. (1980). *Educational evaluation and measurement*. Columbus, OH: Merrill.
- Jacobs, R. L. (1987). An investigation of the learning style differences among Afro-American and Euro-American high, average, and low achievers. Unpublished doctoral dissertation, Peabody University, CA.
- Jalili, F. (1989). A cross-cultural comparative analysis of the learning styles and field dependence/independence characteristics of selected fourth-, fifth-, and sixth-grade students of Afro, Chinese, Greek, and Mexican heritage. Unpublished doctoral dissertation, St. John's University, Jamaica, NY.
- Johnson, C., & Orwig, C. (1998). What is learning style? Retrieved from <http://www.sil.org/lingualinks/library/Llearning/CJ0625/CJ0676.html>
- Joy, S., & Kolb, D. (2007). Are there cultural differences in learning style? *International Journal of Intercultural Relations*, 33(1), 69-85.
- Katz, N. (1988). Individual learning style, Israeli norms and cross-cultural equivalence of Kolb's learning style inventory. *Journal of Cross-Cultural Psychology* 19, 361-379.
- Keefe, J. W. (1979). Learning style: an overview. In J. W. Keefe (Ed.), *Learner learning styles: Diagnosing and prescribing programs*. Reston: NASSP.
- Kinsella, K. (1995). Understanding and empowering diverse learners in ESL classrooms. In J. M. Reid (Ed.), *Learning styles in the ESL/EFL classroom*, pp. 170-194. Boston, MA: Heinle & Heinle.

- Kolb, D. A. (1985). *Learning style inventory: self-scoring test and interpretation booklet*. McBer and Company, Boston, MA
- Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. New Jersey: Prentice-Hall.
- Messick, S. (1994). The matter of style: Manifestations of personality in cognition, learning, and teaching. *Educational Psychologist*, 29, 121-136.
- Messick, S. (Ed.) (1976). *Individuality in learning*. San Francisco: Jossey-Bass.
- Palloff, R. M., & Pratt, K. (2003). *The virtual student: A profile and guide to working with online learners*. San Fransisco: Jossey-Bass.
- Park, C. C. (1997). Learning style preferences of Asian American (Chinese, Filipino, Korean, and Vietnamese) students in secondary schools. *Equity & Excellence in Education*, 30(2), 68-77.
- Pratt, D. D. (1992). Conceptions of teaching. *Adult Education Quarterly*, 42, 203-220.
- Reid, J. (1987). The learning style preferences of ESL students. *TESOL*, 21(1), 87-111.
- Reynolds, M. (1997). Learning styles: A critique. *Management Learning*, 28, 115-133.
- Riding R. (2005). Individual differences and educational performance. *Educational Psychology*, 25(6), 659-72.
- Rose, C. & Nicholl, M. J. (1997). *Accelerated learning for the 21st Century: The six-step plan to unlock your master-mind*. USA: Dell.
- Sadler-Smith, E. (1997). Learning style: Frameworks and instruments. *International Journal of Experimental Educational Psychology*, 17(1), 51-63.
- Schmeck, R. R. (1983). Learning styles of college students. *Individual Differences in Cognition*, 1, 233-279.
- Sims, J. (1988). Learning styles of Black-American, Mexican-American, and White-American Third- and Fourth-Grade Students in traditional public schools. Doctoral dissertation, University of Santa Barbara, Santa Barbara, CA.
- Steinbach, R. (1993). *The adult learner: Strategies for success*. Menlo Park: Crisp Publications.

Williams, G. J. (1990). A study of the learning styles of urban black middle school learning disabled and non-learning disabled students (Doctoral dissertation, Southern Illinois University at Carbondale, 1989). *Dissertation Abstracts International*, 51, 1987A.

Author's Notes

Dr. Mohamed Sywelem, Suez Canal University, Egypt

Dr. Qassem Al-Harbi, Jazan University, Kingdom of Saudi Arabia

Nafsaniath Fathema MBA, Auburn University, Alabama, USA

Dr. James E. Witte, Auburn University, Alabama, USA