

# Learning Styles and Academic Achievement Among University Students

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**Abstract:** A student's learning style preference refers to the way they respond to stimuli in a learning context, and to their characteristics way of acquiring and using information. Each student has his/her own specific learning styles that may influence his academic achievements and students in any course will place a variety of different interpretations onto their lessons. This study aimed to find out the relationship between learning styles and academic performance; to identify the significant influence between learning styles and academic performance; and to determine the mean difference between male and female learning preferences. This study was carried out in UiTM Cawangan Kelantan, UiTM Cawangan Terengganu and UiTM Cawangan Pahang (East Zone of Malaysia) respectively where a total of 400 first year's students from the Faculty of Business and Management, Universiti Teknologi MARA (UiTM) were randomly selected as sample of this study. The result of analyses of variance shows that there is a statistically significant difference in the academic achievement of these students that correspond to the four learning styles developed by David Kolbs. It was found and concluded that converging learning style scored the highest percentage among the respondents towards their academic performance. There was a relationship between students' learning styles that relate to all four learning styles with academic performance. However, converging and accommodating learning styles have moderate relationships with academic performance. In the meantime, the study hypothesized that assimilating and diverging learning styles have weak relationships with academic performance. The result also showed that there was no significant difference between gender and academic performance.

## 1 INTRODUCTION

Learning styles according to Reid (1995) refers to an individual's natural, habitual and preferred way of absorbing, processing and retaining new information and skills. Students in any course will place a variety of different interpretations onto their lessons (Bailey and Garratt, 2002). According to Keefe and Ferrell (1990), learning problems are frequently not related to the difficulty of the subject matter but rather to the type of learning.

Chuah Chong-Cheng (1988) discussed the importance of learning styles as being not only necessary, but also important where each style of learning contributes to the success in retaining what they learnt and Dun (1983) found that dramatic

improvement in students' achievement in cases where learning styles have been taken into account.

There have been many efforts in identifying the problem of low academic performance and some factors have been identified in explaining academic achievement. Among the numerous variables researched include intelligence (Deary, Strand, Smith and Fernandes, 2007), attitudes (Erdogan, Bayram, and Deniz, 2008), behavioral characteristics (Ergul, 2004; Lane, Barton-Arwoo, Nelsonz and Wehby, 2008), self-esteem (Bankston and Zhou, 2002). Learners' styles were found to affect learners' learning behaviors and different learning style preferences (Junko, 1988) and therefore it is important for teachers to examine the variations in their students on their learning styles (Felder & Spurlin, 2005).

A compatible learning style with a strong teaching style of a program instructor will enable the students to retain information much longer than their counterparts who experience mismatch learning and teaching styles (Fedler, 1993). In other words, understanding learning styles will help increase learning benefits especially for low and moderate achieving students (Zin, Zaman Noah, 2002). At least, this helps as the first step in ensuring students' achievement. It is believed that when teachers are able to analyze the differences and needs of their students, the educational process is likely to become optimized for both students and teachers (Fairhurst & Fairhurst, 1995).

This study, therefore, aimed at depicting the different types of learning styles, the relationship of learners' learning styles preference and the overall academic performance of students from the Faculty of Business and Management of Universiti Teknologi MARA branches, so as the information about learner's preference can help teachers become more sensitive to the differences students bring to the classroom.

### 1.1 Objectives of the Study

This study aimed to find out the relationship between learning styles and academic performance; to identify the significant influence between learning styles and academic performance; and to determine the mean difference between male and female learning preferences.

In addition, the research questions for this study included what were the types of learning styles among the Faculty of Business and Management's students; what was the relationship between students' learning styles and academic performance; and was there a difference between learning styles among male and female students toward academic performance.

## 2 LITERATURE REVIEW

Holley and Jenkins (1993) have found that there was a significant difference in learning style. They claimed that students with different learning style perform differently depending on the examination format. There are also a number of studies that have examined the relationship between learning style and academic performance in various disciplines. While some studies indicated the relationship between performance scores and the converging learning styles (Rutz, 2003), others explain the learning styles

differences in student performance as the function of the chosen assessment technique. Based on the previous study, has led the researchers' interest to identify the relationship among students' learning style and academic performance of UiTM students of East Zone of Malaysia.

Cornett (1983) sees it as "a consistent pattern of behavior but with a certain range of individual variability," where students learn differently and thus different learning styles exist (Entwistle, 1981; Honey and Mumford, 1992; Kolb, 1976; Schmeck, 1988). Grasha (1990) defined it as "the preferences student has for thinking, relating to others, and particular types of classroom environments and experiences". According to Kolb (1984), psychological attributes, resulted from individual differences, determine the particular strategies a person chooses while learning. Kolb (1984) and Honey and Mumford (1992) described learning style as an individual preferred or habitual ways of processing and transforming knowledge.

Honey and Mumford (1992) stated that learning exists when someone can do something that he could not do previously. Among the various learning style theories, Kolb's (1984) ELT that defines learning as "the process whereby knowledge is created through the transformation of experience. Different individual uses different learning style and the effectiveness of the learning style also varies among individuals.

Learning style has been defined by various researchers mostly as an indication for individual differences. These differences may noticeable itself in 'life styles' and even in personality types (Zhang & Sternberg, 2005). Sternberg (1997) stated and proposed that styles are at least in part socialized, suggesting that they can, to some extent, be modified. Hence, by being aware of learning styles of his students with their academic achievement, educators and teachers may get huge advantages in managing them.

### 2.1 Learning Styles of Kolb

Learning Style Inventory (LSI) by Kolb (1976) as cited by Zanich (1991) stated that an effective learner relies on four different learning modes, which include concrete experience, reflective observation, abstract conceptualization and active experimentation, and later, Kolb (1976) further classifies learning style into four types, i.e. accommodator, diverger, assimilator and converger.

### 2.1.1 Assimilating

Assimilating learners perceive through active conceptualization (AC) and process by reflective observation (RO) where they experience their world symbolically and transform information through their imagination (Demirbas & Demirkan, 2003). They are more concerned with the abstract concepts rather than practical applications (Kolb & Kolb, 2005).

### 2.1.2 Converging

Converging learners perceive through active conceptualization (AC) and process by active experimentation (AE), bring logical, pragmatic and unemotional perspective to the problem solving process (Hsu, 1999). Their knowledge is organized and they do hypothetical-deductive reasoning while focusing on a specific problem and they are unemotional (Smith & Kolb, 1996).

### 2.1.3 Accommodating

Accommodating learners perceive through concrete experience (CE) and process by active experimentation (AE). This is where accommodating learners are most interested in doing things. They feel their environment concretely through their feelings and utilize actions to transform information (Hsu, 1999). They are risk takers and hence, enjoy finding out new experiences. They also solve problems using a trial-and-error method instead of using analytical abilities. In addition, they prefer to work, set goals, do field work and test various approaches with others (Kolb & Kolb, 2005).

### 2.1.4 Diverging

Diverging learners perceive through concrete experience (CE) and process by reflective observation (RO). These learners are imaginative and emotional at the same time (Smith & Kolb, 1996). They have the ability to synthesize and/or assimilate various observations for new idea generation (Hsu, 1999). They are less concerned with theorisms and generalizations. Their approach to problem solving is not systematic, but is more creative as compared to the other learning styles. These learners listen to the suggestions of others and accept critiques from his group (Kolb & Kolb, 2005).

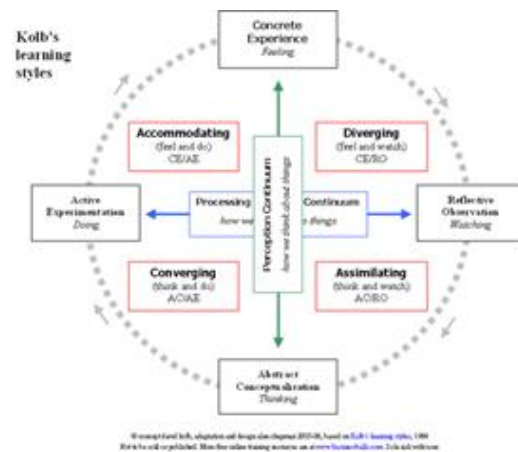


Figure 1: The diagram of Kolb's learning styles.

## 2.2 Academic Performance

Cano and Justicia (1993), stressed that students with better academic achievement scored higher in Concrete Experience, Abstract Conceptualization and Reflective Observation than those with poorer academic achievement. This result is further substantiated by Cano-Garcia and Hughes (2000) who also demonstrated that students with better academic achievement scored higher in Concrete Experience.

However, empirical research indicates inconclusive association between reflective thinking and the academic performance in different discipline. For instance, Phan (2007) demonstrates that understanding (being part of reflective thinking) is related negatively with academic performance for students of educational psychology, whereas, critical thinking (part of reflective thinking) is positively associated with academic performance for students in the mathematics discipline.

Felder (1995) stressed that students learn more when information is obtainable in a variety of approaches than when only a single approach is applied. Much experiential research indicates that learning styles can either hamper or increase academic performance in several aspects even though not much research has been conducted on the relationship between instructional design of learning materials and learning styles (Riding & Cheema 1991). Therefore, it can be hypothesized as:

*H1: There is a significant relationship between assimilating style and academic performance.*

- H2: There is a significant relationship between converging style and academic performance.
- H3: There is a significant relationship between accommodating style and academic performance.
- H4: There is a significant relationship between diverging style and academic performance.

The conceptual framework for this study has been adapted on the diagrams of Kolb’s Learning Styles. The independent variables for this study were Learning Styles which include four types of learning styles which are accommodating, diverging, converging and assimilating. The academic performance is the dependent variable for this study. This study focused on the relationship among student learning style and academic performance and the differences between genders.

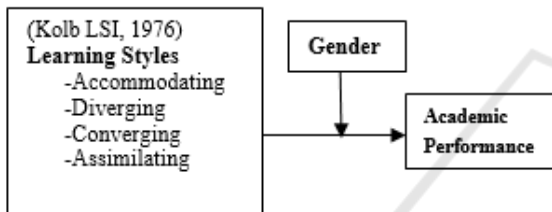


Figure 2: Conceptual framework: Students’ learning style and academic performance.

### 3 METHODS

This research is important to identify the types of learning styles among students and their relationship towards academic performance. According to Schroeder (1993), when the learning styles were considered in the teaching-learning process, student achievement will be enhancing.

The instrument used for this study to generate data was the survey questionnaire. The questionnaire consisted of three sections; Section A of demographic information; Section B of questions that relate to student learning styles and Section C of questions that relate to students’ academic performance according to their course grade.

The research design for this study was a correlational. Correlational research is a method of research used to determine relationship between two or more variables. This type of research describes the linear relationship between two or more variables without any hint of attributing the effect of one variable on another. If they do, the two are correlates with one another (Salkind, 2006).

This study was carried out in UiTM Cawangan Kelantan, UiTM Cawangan Terengganu and UiTM Cawangan Pahang (East Zone of Malaysia) respectively. The total population of the first year students of the Faculty of Business and Management from these three branches were 1000 students. According to Krejcie and Morgan (1970), when the population is 1000, the required sample size is 278. As to get 278 respondents, a total of questionnaire distributed was 400 from the first year’s students from the Faculty of Business and Management, were randomly selected. The questionnaires were distributed and collected personally and the respondents were given one week to answer the questionnaires.

## 4 RESULTS AND DISCUSSION

All data were analysed using the Statistical Package in the Social Science Software (SPSS) version 22.0. The data were analyzed for normality, correlation, descriptive statistics, frequencies, multiple regression and a T-Test after the entire questionnaire had been collected from the respondents. 280 questionnaires were returned. However, only 196 questionnaires were usable for further analysis.

### 4.1 Normality

Normality test was conducted and measured using skewness and kurtosis. Normality test are used to determine if a data significantly deviate from a normal distribution.

Table 1: Normality result.

	Academic Performance	Assimilating	Converging	Accommodating	Diverging
Skewness	-0.399	0.230	0.219	-0.389	0.106
Kurtosis	2.365	1.251	0.771	-0.419	0.618

Based on the above table, the result of normality test range from -0.419 to 2.365, considered that all value is acceptable. According to Doane and Tracy (2001), the value between -3 and +3 are acceptable and consider as a normal. It means that all variables that used in this study are normal. Hence, the researcher can proceed for further analysis.

### 4.2 Demographic Profile

Table 2: Demographic profile.

Gender	Frequency	Percentage (%)
Male	35	17.9
Female	161	82.1
<b>Total</b>	<b>196</b>	<b>100.0</b>

Age	Frequency	Percentage (%)
18-20	190	96.9
21-25	6	3.1
<b>Total</b>	<b>196</b>	<b>100.0</b>

Education	Frequency	Percentage (%)
SPM	135	68.9
Diploma	61	31.1
<b>Total</b>	<b>196</b>	<b>100.0</b>

Female contributed 161 respondents out of 196 from the total of respondents that involved in this study with 82.1 percent. While the male respondents involved were 17.9 percent of the frequency of respondents i.e. 35 respondents out of 196. The majority of respondents are between ages of 18 to 20 years old with 190 respondents (96.9 percent). While 6 respondents come from the age of 21 to 25 years old which indicated 3.1 percent. In addition, 38.8 percent or 76 respondents obtained a CGPA in between 3.00 to 3.49 followed by 25.5 percent or 50 respondents scored in between 2.50 to 2.99. 21.4 percent or 42 respondents obtained a CGPA in between 3.50 to 4.00, while 12.2 percent or 24 respondents received n between 2.00 to 2.49. Lastly, only 2.0 percent or 4 respondents scored below than 2.00 for their CGPA.

### 4.3 Pearson Correlation Analysis

Pearson Correlation analysis is a statistical analysis that summarizing the strength of association between two metric variables (Malhotra, 2010). The correlation is a technique on how strongly pairs of variables are correlated.

Table 3: Correlation coefficient.

Variables	AP	Ass	Con	Acc	Div
Academic Performance	1				
Assimilating	0.398**	1			
Converging	0.480**	0.569**	1		
Accommodating	0.401**	0.344**	0.414**	1	
Diverging	0.396**	0.274**	0.095	0.036	1

\*\* Correlation is significant at the level 0.01 level (2 tailed)

\* Correlation is significant at the level 0.05 level (2 tailed)

The relationship between assimilating, converging, accommodating and diverging with academic performance has been tested. Assimilating (r value = 0.398, p-value < 0.01), indicate that positive relationship between assimilating with academic performance and has a weak strength of association with academic performance. Then, converging (r value = 0.480, p-value < 0.01) showed there is a positive relationship and has a moderate strength of association between converging with

academic performance. Furthermore, for accommodating (r value is 0.401, p-value < 0.05), indicate there is a positive relationship with academic performance by signifying a moderate strength of association with academic performance. Lastly, diverging (r value = 0.396, p-value < 0.01), indicate that positive relationship between diverging with academic performance with a weak strength of association with academic performance.



Table 4: Result of hypotheses testing.

Hypotheses	t-value	Sig	Result
H1: <i>There is a significant relationship between assimilating style and academic performance.</i>	0.469	0.000	Supported
H2: <i>There is a significant relationship between converging style and academic performance.</i>	4.636	0.000	Supported
H3: <i>There is a significant relationship between accomodating style and academic performance.</i>	3.888	0.000	Supported
H4: <i>There is a significant relationship between diverging style and academic performance.</i>	5.949	0.000	Supported

The study hypothesized that assimilating has a significant relationship with academic performance (t-value = 0.469, p-value = 0.000). Thus, the result of H1 is supported. Besides that, the study revealed that converging has a significant relationship with academic performance (t-value= 4.636, p-value = 0.000), hence, the result of H2 is also supported. In the meantime, accommodating has a significant relationship with academic performance (t-value = 3.888 and p-value = 0.000). Thus, the result of H3 is supported. Finally, diverging has a significant relationship with academic performance (t-value = 5.949, p-value = 0.000) and therefore, the result of H4 is supported.

#### 4.4 T-Test Result for Gender Differences

Table 5 showed the result of independent sample test between two groups; gender and academic performance. Sig. (2-tailed) from the table below was .201. As referred to Julie Pallant (2005), if the value in the Sig (2-tailed) column is equal or less than .05, then there is a significant difference in the mean score on the dependent variable for each of the two groups. If the value is above .05, there is no significant difference between the two groups. Therefore, the result showed that there was no significant difference between gender and academic performance.

Table 5: Independent sample t- test.

Variables	t	Df	Sig. (2-tailed)
Learning Styles	-1.283	264	.201
Equal variances assumed			
Equal variances not assumed	-1.706	136.416	.090

## 5 CONCLUSIONS

From this study, it can be concluded that converging learning styles scored the highest percentage among the respondents towards their academic performance. People learn in different styles but some may adapt their learning styles according to tasks (Pask, 1976). The convergent learning style relies primarily on the dominant learning abilities of abstract conceptualization and active experimentation. The greatest strength of this approach lies in problem solving, decision-making, and the practical application on ideas (Kolb, 1984). In addition, accommodating learning style scored the least percentage among the respondents towards their academic performance.

It can also be concluded that assimilating has a significant relationship with academic performance, where the result of H1 is supported. In addition, the study revealed that converging and accommodating also have significant relationships with academic

performance but they are moderate relationships and thus, the result of H2 and H3 are also supported. Finally, it is also concluded that diverging has a weak significant relationship with academic performance and therefore, the result of H4 is supported as well.

The result also showed that there was no difference between gender and academic performance. This is align with Othman and Othman (2004) who found that there are no differences in learning styles between males and females and Wei (2009) also found there are no significant differences in learning styles Selmes 1987 based on gender, the result of this study is somehow different.

Awareness of student learning style could provide a basis for educators to optimize teaching methods for diverse students' populations. Learning style diversity, when properly understood by both students and educators can be converted into appropriate teaching and learning methods that enable more students to attain success.

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