

# AN ANALYSIS OF LEARNING STYLES OF DISTANCE LEARNERS AT THE INSTITUTE OF EDUCATION DEVELOPMENT, UNIVERSITI TEKNOLOGI MARA, MALAYSIA

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## **Abstract**

Presently, no information could be obtained on the learning styles of distance learners as it has not been studied before. A study was carried out to identify the learning styles of distance learners at the Institute of Education Development, Universiti Teknologi MARA, Malaysia. Felder's Learning Styles Index (LSI) was used in the study. Results of the study were used to make comparison and correlation analyses between learning styles and academic achievement, programme of studies, gender and income. One hundred and sixty two students responded to the online questionnaire. The study showed that 35.5% students preferred visual learning style followed by 29.6% sensory, 14.2% active, 0% verbal and 2.5% intuitive. The male students were found dominant in visual learning style as compared to the females who were sensory dominant. The students who were majors in banking tended towards sensory style as compared to finance and business studies students who were inclined towards visual style. While the mass communication and public administration students dominated in visual and sensory styles. The higher income students preferred more visual style as compared to the middle income who were dominant in both visual and sensory. The higher achievers were found to be better disposed towards visual as compared to low achievers who were sensory dominant in style. The learning styles were not significantly different between genders, programme of studies and semesters. It was also found that there was no significant relationship between learning styles and academic achievement. This paper discusses in detail the implications of the various learning styles on students of distance mode of education.

## **Introduction**

Learning styles can generally be defined as a group of attributes and behaviour that determine the way or approach of learning preferred by an individual (Honey & Mumford, 1992). Thus it is a combination of factors characterized by cognitive, affective as well as psychological (Duff, 2000). Normally, individuals differ in their views and attitudes towards a situation, thus the way or styles they learn are also different.

Various learning styles models have been forwarded by many researchers working in this field of research. Among them is by Kolb (1976), that was based on learning cycle. Kolb identifies four types of approaches preferred by many individuals, they are active experimentation, reflective observation, abstract conceptualization and concrete experience. The four approaches parallel to the levels of learning cycles that begins with taking action, followed by seeing results, thinking about results and finally planning for the next time.

Based on the Kolb's model, Honey and Mumford (1985) proposed their own model that individual possesses four learning styles, the activist, reflector, theorist and pragmatist styles. Each individual possesses the four styles, but differ in term of degree of preference of one style than the others.

Richard Felder (1993) proposed a five dimension dichotomy learning style that is related to the information transfer process to an individual. The first dimension is on the most preferred type of

information to be assumed, that is either sensory or intuitive information. The second dimension is on the most effective mode of senses to obtain information; either visual or verbal. Then, followed by the most preferred arrangement or organisation of information; either inductive or deductive. The fourth dimension is about the most preferred approach to process information; either actively or reflectively. The final dimension is on the advances of understanding the information; either sequentially or globally.

No matter what model is referred, since learning style is a composition of cognitive, affective and psychological attributes that guides individual to interact and react on learning environment, it undoubtedly affects the learning outcomes of an individual (Syed Jamal Abdul Nasir Syed Mohamad, et al., 2002). Students whose preferred learning style matched the teaching style of his teacher tend to store the information longer, use it more effectively, more positive towards his course, in contrast to others whose learning style mismatched his teacher's (Felder, 1993).

Since learning styles affect significantly an individual's learning outcomes, many studies have been carried out on learning styles of students at various levels of study, relating the results to various academic variables and demographic profiles. In the present study the respondents are e-Distant Learning (e-DL) students of Universiti Teknologi MARA (UiTM), Malaysia. The study adopted the Felder (1993) learning style model. Index of Learning Styles (ILS) questionnaires developed by Solomon and Felder in 1993 was used in the study to evaluate the respondents' preference on the five dimension of the model. The reliability of the ILS has been tested, and used by many researchers in the studies.

### **Problem Statement**

UiTM e-DL students attended their studies off-campus and on-line, interacting with the respective lecturers on study modules through internet. They also attended monthly face-to-face seminar with the respective lecture in charge of the module. The mainly composed of adult learners, with their own carriers, and different background, registered for various programmes offered by the university, at diploma as well as first degree level. Hence, it is expected that they would prefer different learning styles. At the same time the adopted learning style can vary based on previous experience and current environment (Honey and Mumford, 1995).

The course modules prepared for the e-DL students most often produced without taking into account the students preferred learning styles, or somewhat bias towards one dichotomy dimension of learning styles. This could partly be attributed to the lack of data on students' preferred learning styles. Thus, there might be great possibility that the presentation style of the module is antagonistic to the learning style of the majority of students. The implication of this situation is very obvious.

### **Objective**

The main objectives of the present study are:

- i. To identify the distance learners' learning styles.
- ii. To make comparison and correlation between learning style and programme of studies, level of study and student's profiles.
- iii. To determine the correlation between learning style and academic performance.

### **Methodology**

The total population of e-DL students in the present study is 2000, enrolled in various programmes at diploma and first degree levels. Based on the formula suggested by Cohen (2001) a total of 322 students were selected based on stratified random sampling method. Stratified method was used to

select respondents enrolled in diploma and degree levels. In this study a total of 162 students returned the completed and perfect questionnaire. This number was achieved after follow-up was done to ensure they return the questionnaires.

The study tool used was the ILS questionnaires developed by Felder and Silverman (1993). The questionnaires contained 44 items. Eleven items each arranged randomly are able to identify the respondent's learning styles out of the four domain; active/reflective, sensory/intuitive, visual/verbal and sequential/global.

The questionnaires forms were distributed to students during the monthly seminar session. The questionnaires has been proved to be reliable by Zywno (2003) as a tool for behavioural study. The same author has also reported that the questionnaires has high construct validity.

Each respondent's learning style preference was determined by totaling up the style in each domain, then the difference of the totals within the domain was determined. Learning style with the highest score (total) corresponds to the preferred style. The data was then analysed using SPSS. The overall analysis of the respondents' learning styles was descriptively analysed using percentage and mean. To analyse the correlation between learning styles and programmes, semesters of study and academic achievements chi-squared test was used. Lavene test was also carried out to explore the variation between the learning styles.

## **Results**

Out of 220 questionnaires returned by the respondents, only 162 can be accepted for analysis. Out of this, 63 are male respondents and 99 female. Majority of them attending semester 5 (27.2%), semester 6 (18.5%) and semester 3 (13.6%). In terms of programmes attended, 62.5% of the respondents attended Diploma in Public Administration programme, 15.4% Diploma in Business Administration, 8.6% Diploma in Accountancy and 8.0 % attending Bachelor in Business Administration, majoring in Marketing. In term level of study, 87.1% respondents are at diploma level.

As for monthly income, the majority (58.6%) of respondents fall in the RM 1001 – RM 2000 range, that is the salary range of worker with Malaysian Certificate of Education qualification. This is followed by monthly salary of less than RM 1000 (21.0%). Only 13% of respondents take home between RM2001 – RM 3000 monthly, while 7.2% respondents were paid more than RM3000 per month.

In terms of academic performance, majority (49.4 %) of respondents fall into the CGPA range of 2.50 – 2.99, while 32.1% in 2.00 – 2.49 range. Around 13% in the 3.00 – 3.49 range, while only 3.1% obtained CGPA more than 3.50.

### **Most dominant learning style**

Based on the Felder model, the score for each style of each student was measured using 1 to 11 scale. The higher the score the higher the preference towards the respective style. Results of the study show that the most dominant style is visual (35.2%), followed by sensory (29.6 %). A reasonably high preference was also shown on active style (14.2%) and sequential style (8.0%). However, preference towards other styles were low; 5.6% for global, 4.9% for reflective and 2.0% for intuitive. None of the respondents showed any preference towards verbal style.

### **Learning style according to gender**

Since both gender variables and learning styles variables are nominal data, non-parametric analysis, the chi-squared test for probabilistic difference was used to test the following hypothesis,

- H0: No difference in learning style between male and female respondents.  
H1: There are differences in learning style between male and female respondents.

Table 1 shows the results of the chi-squared test. It shows that the probability value  $p = 0.157$  is higher than 0.05. Therefore, we can not reject  $H_0$ . Thus it can be concluded that there is no difference in learning style between male and female students.

**Table 1: Chi-squared test for gender**

Difference between gender for:	Statistical Value	p-value
Learning Styles	9.313	0.157

### Learning style according to income

Again, chi-squared test was used to test the correlation to evaluate the hypothesis

- H0: No correlation between learning style and income.  
H1: There is correlation between learning style and income.

Table 2 shows the results of the chi-squared test. It shows that the probability value  $p = 0.536$  is higher than 0.05. Therefore, we can not reject  $H_0$ . Thus it can be concluded that there is no correlation between learning style and students' monthly income.

**Table 2: Chi-squared test for income**

Correlation between income for:	Statistical Value	p-value
Learning Styles	28.648	0.536

### Learning style and fields of study

Since both fields of study variables and learning styles variables are nominal data, non-parametric analysis, the chi-squared test can be used to evaluate the correlation of the following hypothesis,

- H0: No correlation between learning style and students' fields of study.  
H1: There is correlation between learning style and students' fields of study.

Table 3 shows the results of the chi-squared test. It shows that the probability value  $p = 0.896$  is higher than 0.05. Therefore, we can not reject  $H_0$ . Thus it can be concluded that no correlation between learning style students' fields of study.

**Table 3: Chi-squared test for fields of study**

Difference between field of study for:	Statistical Value	p-value
Learning Styles	25.778	0.896

### Learning style and semester attended

Again, chi-squared test was used to test the correlation between learning styles and semester attended by students. The test was used to evaluate the hypothesis

- H0: No correlation between learning style and semester attended.

H1: There is correlation between learning style and semester attended.

Table 2 shows the results of the chi-squared test. It shows that the probability value  $p = 0.465$  is higher than 0.05. Therefore, we cannot reject  $H_0$ . Thus it can be concluded that no correlation between learning style and the semester attended by students.

**Table 4: Chi-squared test for semester attended**

Correlation between semester attended for:	Statistical Value	p-value
Learning Styles	66.348	0.465

Analysis of variance was also carried out to compare students learning styles attending various semesters. Levene test was applied to ensure that analysis of variance can be carried out, since the assumption of equal variance is important before analysis of variance can be carried out. The hypothesis was focused as below

$H_0$ : Variance for variable semester is identical.

H1: Variance for variable semester is different.

Table 5 shows the results of Levene test. The p-value obtained was 0.320, that is larger than 0.05. Thus  $H_0$  is accepted at significant level 0.05. This means that the variance of variable semester is the same, hence analysis of variance can be carried out.

**Table 5: Results of Levene test**

Levene Statistic	p-value
1.160	0.320

Here, the analysis of variance carried out was to test the hypothesis

$H_0$ : No difference between learning style and semester attended.

H1: There are differences between learning style and semester attended.

Based on the p-value in Table 6 for analysis of variance, it was found that  $p = 0.274$ , and this is bigger than 0.05. Thus it can be concluded that there is no difference in learning style preferences for various semesters attended by students.

**Table 6: Analysis of variance for semester attended**

F value	p-value
1.277	0.274

### **Learning style and academic achievement**

Since the variable academic achievement and learning styles are both ordinal and nominal data, non-parametric analysis that is chi-squared test for correlation between both variables will be used to test the hypothesis

$H_0$ : No relation between learning styles and academic achievement.

H1: There is relation between learning styles and academic achievement.

Based on the p-value of chi-squared test in Table 7, it was found that  $p = 0.162$ , and higher than 0.05. Thus, it can be concluded that there is no relation between learning styles and academic achievement.

**Table 7: Chi-squared test for academic achievement.**

Relation between academic achievement for:	Statistical value	p-value
Learning styles	30.722	0.162

Analysis of variance was also carried out to compare students learning styles with academic achievement. Levene test was used to test the equivalence of variance below

Ho: Variance for variable academic achievement is identical.

H1: Variance for variable academic achievement is different.

Table 8 shows the results of Levene test. The p-value obtained was 0.066, that is larger than 0.05. Thus Ho is accepted at significant level 0.05. This means that the variance of variable semester is the same, hence analysis of variance can be carried out.

**Table 8: Results of Levene test**

Levene Statistic	p-value
2.029	0.066

The analysis of variance carried out was to test the hypothesis

H0: No difference between learning style and academic achievement.

H1: There are differences between learning style and academic achievement.

Based on the p-value in Table 9 for analysis of variance, it was found that  $p = 0.305$ , and this is bigger than 0.05. Thus it can be concluded that there is no difference in learning style preferences academic achievement of students.

**Table 9: Analysis of variance for semester attended**

F value	p-value
1.209	0.305

## **Discussion and Conclusion**

Learning styles has been identified as one of the main contributing factors to the effectiveness of an individual learning process. Thus the present study focused on the preferred learning styles of e-DL students of UiTM and its relation to the respondents background such as gender, programme attended, semester of study, academic achievement as well as monthly income.

Based on the results of the study, generally there is no correlation between the studied variables and learning styles adopted, based on the Felder model. However, two main dominant learning style adopted by respondents are visual and sensory. The study shows that no significant difference on the two learning styles preference based gender, academic performance, semester and income of the respondents. The information should be used or taken into account in the planning for e-DL students learning activities. The plan includes preparation of modules, conducting seminars, as well as implementing of virtual interaction with the respective facilitators. The study also brought up a clear

picture to the management and teaching faculty that the scope of learning style for this group of students is very wide. Plan should be done strategically to optimise the effectiveness of the students' learning process.

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