

The Impact Of E-Learning On Academic Performance

-Special Reference to Third Year Management Students, of the Faculty of Commerce and Management, Eastern University, Sri Lanka.

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ABSTRACT

This study focused on the impact of e-learning on academic performance. This is undertaken to identify whether or not personal-characteristic-related learning style differences influence the extent to which students benefit from e-learning.

The and data was collected from 50 respondents selected from third year management students of Eastern University of Sri Lanka (EUSL) using the simple random sampling method. Primary data are collected using self-administered questionnaire.

Emphasis was put on trying to establish the relationship between Prior computer skills and Hours spend in online and Socio-demographic Characteristic and academic performance of undergraduate students at Eastern University of Sri Lanka (EUSL). Pearson Correlations and Multiple Regression Analysis are employed to identify whether the two factors have relationship with the academic performance of university students.

The findings show that both Prior computer skills and Hours spend in online and Socio-demographic Characteristic have positive relationship with academic performance while

Prior computer skills and Hours spend in online has the greatest impact on academic performance among the both independent variables.

It is concluded that in order to improve academic achievement, higher education should consider aiming to develop e-learning strategies that encourage greater engagement and also take into consideration the different learning styles found within the student body.

1. INTRODUCTION

E-learning is the use of Information and Communication Technology. It has become an increasingly popular learning approach in higher educational institutions due to vast growth of internet technology.

Nowadays E-learning has a competitive advantage and many universities have implemented it and this has impacts on students' performance or GPA. However, still there are other universities and academic institutions that use very low interactive E-learning which is not enough to contribute to the performance of the students. In contrary to that, other higher educational institutions use highly interactive E-learning which directly improves students' performance in general (Rodgers, 2008). Today technology is a tool used to remove geographical barriers and facilitates everybody to learn anytime and anywhere without the presence of the lecturer. The main purpose of E-Learning is

to increase accessibility of education and reducing costs and time as well as improving students' academic performance.

1.1 Background of the Study

Education is a key factor for sustainable development (Chimombo 2005). The significance of education, especially in developing countries, is increasing because of progressing pressure to catch up with the developed world regarding, for example, global competitiveness (Hawkins 2002). Predictably, educational settings are different in developing countries than in developed countries, such as low quality of education and narrow possibilities in attending schools in rural areas because of far distances and high opportunity costs (Ibid 2005).

A broad range of learning approaches exists already, for example, e-learning, blended learning (Maier, 2007), and distance learning which utilize information and communication technology (ICT). The growth of e-learning programs according to Lockwood and Gooley, 2002 is driven by the need for and potential of providing education in less expensive ways, increased access to information, effective learning and greater flexibility.

Khan (2005) pointed that E-learning has been described in various ways as learning using a number of different technologies and methods for delivery e.g. Computer Based Training (CBT), Internet-based training (IBT), Web-based instruction (WBI), advanced distributed learning (ADL), distributed learning (DL), distance learning, online learning (OL), mobile learning (or m-learning) or remote learning and learning management systems (LMS).

Khan 2005 suggests that e-learning system is used for an open, flexible, and diverse E-learning environment. Moreover E-learning system can be analysed as an inventive approach for delivering, learner-centred, interactive, and facilitated learning environment to anyplace, anyone, anytime by utilizing the features and resources of different

digital technologies along with other types of learning materials suited for an open, distributed, and flexible learning environment (Ibid, 2008).

1.2 Problem Statement

E-learning has become an increasingly popular learning approach in higher educational institutions due to the rapid growth of Internet technologies.

This study sought to establish whether the e-learning help the students improve their grades, skills, values, necessary to apply in their academic tasks. The study endeavoured to answer the following questions, what role does prior computer skills play in improving student's performance: In so doing, the study sought to measure the ability of the students to use e-learning tools such as internet/intranet, computers, and software for particular purposes. What is the role of personal characteristics on academic performance? To measure personal characteristic the study sought to identify variable such as gender is helped the researcher know such personal issues that may influence a student's usage and acceptance of the technology as may be informed by individual's socialization. Lastly, what is the impact of hours spent online/offline has on students?

1.3 Research Questions

- i. To what extent do socio-demographic characteristics influence on academic performance?
- ii. To what extent do prior computer skills play in academic performance?
- iii. To what extent does the level of engagement (hours online/offline) in the e-learning process affect the academic performance?
- iv. To what extent the E-learning impacts on academic performance?

1.4 Objectives of the Study

- i. To determine the impact of socio-demographic characteristics on academic performance.
- ii. To establish the role of prior computer skills play the academic performance.
- iii. To establish the impact of number of hours spent online/offline (Time management) on academic performance.
- iv. To establish the impact of e-learning on academic performance.

1.5 Significance of the Study

The present study has great significance. First of all, the study findings provide an idea about the e-learning aspects and academic performance in order to provide key information to further research work in such areas. In the same way, the study provides knowledge and guidelines to that may be of help to policymakers. Finally, this study provides an input to the students, teachers and researchers in the areas of e-learning.

Research works are embarked upon with a view to extending the knowledge. The present study was therefore carried out with this same objective, especially in the field of e-learning. It has therefore, contributed to the extension of the frontier of knowledge in the following ways. First, the study has shown the predictive power of the selected factors, especially socio-demographic factors, prior computer skills and time management status in the determination of the academic performance.

2. LITERATURE REVIEW

2.1 The Role of E-Learning on Academic Performance

Attitudes concerning e-learning, echoed by scholarly and academic reviews, range from neutral to positive. On one hand, it is noted that e-learning is at least as effective as traditional instructional strategies (Rosenberg, Grad and

Matear, 2003), and that there are no major differences in academic performance between the more traditional and more technology-oriented modes of instruction (Cavanaugh, 2001). On the other hand, many reviews go further, reflecting a principally positive attitude towards the impact of e-learning (Mayer, 2003). The current piece sought to demystify e-learning by concentrating on how specific e-learning factors (socio-demographic characteristics, hours spent on-line and prior computer skills) influence individual academic performance.

There is a considerable body of evidence to suggest that different teaching delivery styles can have different degrees of success; as measured in terms of academic results (Emerson & Taylor, 2004). In relation to online teaching, some studies indicate that this medium of delivery has a positive impact on performance, for example, Smith and Hardaker (2000). Other studies however, find that greater online teaching has a negative impact on performance (Johnson, 2005).

Benefits include offering a variety of new possibilities to learners (Breuleux, Laferrière, & Lamon, 2002), in addition to having a positive effect on students' achievement in different subject matter areas (Chambers, 2003). Other benefits of electronic education include increases in enrolment or time in school as education programs reach underserved regions, broader educational opportunity for students who are unable to attend traditional schools, access to resources and instructors not locally available, and increases in student-teacher communication. According to Barker & Wendel (2001) students in virtual schools showed greater improvement than their conventional school counterparts in critical thinking, researching, using computers, learning independently, problem-solving, creative thinking, decision-making, and time management.

2.2 The Role of Prior Computer Skills on Performance in E-Learning Setup

Some learners are better prepared than others to use e-learning technologies to facilitate their educational progress; individual “readiness” seems to be a crucial factor in accounting for the success of e-learning applications in education. Looker and Thiessen (2002), in their paper noted that digital divide for Canadian youth, remarked that access to, and experience with, computer technology determines “computer competency”, and that this competency is generally associated with urban residents of higher economic status.

Levin and Arafah (2002) remarked on the differences between students who are highly gifted in the internet usage and those who have had little opportunity to develop their experience with networking tools. Dewar and Whittington (2000) concluded that adult learners’ learning styles (as indicated by Myers-Briggs personality types) can predict the pattern of their participation in online courses.

2.3 The Role of Socio-Demographic Characteristics on Academic Achievement

There have been numerous studies on the relationship between socio-demographic characteristics and academic performance. Some studies focused on specific socio-demographic Variables and e-learners’ academic performance, characteristics or areas such as gender and learning styles (Blum, 1999; Shaw & Marlow, 1999; McLean & Morrison, 2000), ethnicity and learning styles (Jaju, Kwak&Zinkham, 2002), academic performance and learning styles in both Information Technology (IT) and non- Information Technology (non-IT) subject areas and in distance and contact courses (Aragon, Fowler, Allen, Armarego& Mackenzie, 2000; Papp, 2001; Johnson &Shaik, 2002; Neuhauser, 2002; Zywno&Waaln, 2002.

Cuneo, Campbell & Harnish (2002) list several individual characteristics that may determine the outcomes of technological interventions: motivation, computer skills, literacy skills,

communication skills, and learning styles. Cuneo and Harnish (2002) point out that “quasi-open computer-mediated environments are not safe places for students unsure of their writing skills and knowledge, online learning might not be appropriate for all students”. Looker and Thiessen (2002) in their survey of Canadian high school students indicated that females demonstrated less interest (and less confidence) in achieving computer competency. Bryson, Petrina and Braundy (2003) studied “gender-differentiated participation” in British Columbia schools; they noted that the percentage of girls enrolled in technology-intensive courses remains extremely low, while performance data indicate that those female students who participate in these courses do better, on average, than male students in these courses.

2.4 Student Engagement (Hours Spent Online/Offline)

Research suggests that student academic performance may be affected by both engagement effects and learning-style effects. Carini et al (2006) found that, although in general, the relationship between engagement and performance is complex; engagement is positively correlated with student performance. Their conclusion is supported by a number of empirical studies: Rodgers and Ghosh (2001) identified that ‘effort’ (or engagement) levels were highly significant in determining student examination performance. Although, another study made in an e-learning context (Davies and Graff, 2005) found that online engagement had no statistically-significant impact on examination performance. Additional studies in this area have examined the issue of what determines the amount of time that a student spends on e-learning. Arbaugh (2000) argues that this will depend on the student’s attitude to the perceived usefulness, and also the ease of use, of this delivery medium. It is suggested that students who spend more time on internet-based courses tend to be the ones who take more ownership of the learning process, and as a consequence receive the greatest learning benefit (good performance as

measured by grades). From this it can be inferred that we might expect to find a significant, and positive, relationship between the level of e-learning engagement and academic performance.

3. Conceptual Framework

The conceptual framework was used in this study, the independent variables are socio-demographic characteristics and prior computer skills & hours

spent online that may influence the academic performance of individual. Prior computer skills are thought to make it easy for students to use computers and computer software that are used to during the course of study, socio-demographic characteristics include gender. Academic performance is the dependent variable in this study, how does academic performance vary based on the independent variables.

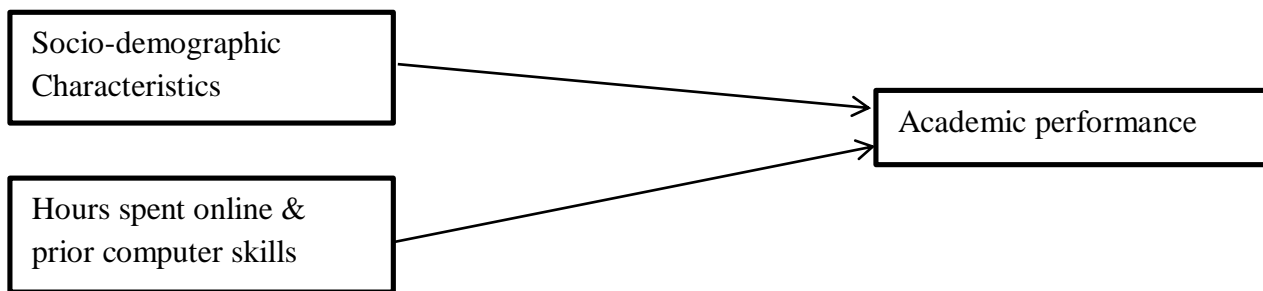


Figure 3.1: Conceptual Framework
Source: - Developed by Researcher

4. RESEARCH METHODOLOGY

4.1 Research Design

Quantitative research method was utilized in this study for analyzing the collected data statically and numerically. In this study, the researcher sought to establish the relationship between socio-demographic characteristics and prior computer skills & level of student engagement effect on academic attainment.

4.2 Unit of Analysis

This study is concerned the units of analysis will be the individual students selected in third year Bachelor of Business Administration programme of the Faculty of Commerce and Management in the Eastern University, Sri Lanka..

4.3 Time Horizon

This study was a cross sectional one in the time horizon, because data were collected in a one single time from the respondents.

4.4 Sample Size, Sampling Distribution

In this research the researcher considers students from third year Bachelor of Business Administration programme of the Faculty of

Commerce and Management in the Eastern University, Sri Lanka.. There are 76 students studying in the third year Bachelor of Business Administration programme. Out of these students, only 50 students were selected as a sample to conduct this random sampling method.

4.5 Data Collection Procedures and Instruments

The main instrument of data collection in this study was questionnaire. The questionnaire consisted two sections: Section 1- Personal information and Section 2: Study information.

4.6 Data Analysis and Evaluation

In this study, data was analyzed using descriptive analysis, frequency analysis, Pearson coefficient correlation analysis and regression analysis of sample from SPSS software application.

4.6.1 Reliability of Research Instruments

The researcher computed the reliability for multi-item opinion questions using SPSS computer software. The items were tested using Cronbach's alpha.

Table 4.1 Decision rule: Reliability analysis

Cronbach's alpha	Internal consistency	Range	Decision Attributes
$0.9 \leq \alpha$	Excellent	$r= 0.5$ to 1.0	Strong positive relationship
$0.8 \leq \alpha < 0.9$	Good	$r= 0.3$ to 0.49	Moderate positive relationship
$0.7 \leq \alpha < 0.8$	Acceptable	$r= 0.1$ to 0.29	Weak positive relationship
$0.6 \leq \alpha < 0.7$	Questionable	$r= -0.1$ to -0.29	Weak negative relationship
$0.5 \leq \alpha < 0.6$	Poor	$r= -0.3$ to -0.49	Moderate negative relationship
$\alpha < 0.5$	Unacceptable	$r= -0.5$ to -1.0	Strong negative relationship

Source: Wikipedia

4.6.2 Univariate analysis and evaluation

This study evaluated the level of individual characteristic of dimensions by using following criteria.

Table 4.2 Decision criteria for Univariate analysis

Range	Decision Level
$1.0 \leq X_1 \leq 2.0$	Low level
$2.0 < X_1 \leq 3.0$	Moderate level
$3.0 < X_1 \leq 4.0$	High level

Source- Developed for the study purpose

Note: - If the range of r is $-0.1 < r > +0.1$ it implies no correlation between two variables.

Independent variables:

- V1- Socio-demographic characteristics
- V2- Prior computer skills & Level of student engagement

Dependent variable:

- V3- Academic performance

Where X_1 = Mean value of a variable

Source- Developed for the study purpose

4.6.3 Bivariate analysis and evaluation

This study assessed the significant relationship of study variables, if the respective p-value is less than 0.05. However, the correlation is considered meaningful to an extent as indicated in the following table.

Table 4.3 Decision criteria for correlation analysis

4.6.5 Multiple regression analysis and evaluation

Multiple regression analysis was carried out to find out the impact of several independent variables on dependent variables.

Decision criteria for the results of Regression

$p \geq 0.05$: There is no influence of independent variables on dependent variables.

$p < 0.05$: There is an influence of independent variables on dependent variables.

5. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

5.1 Socio Demographic Characteristics

This section presents the socio-demographic information of the respondents. The study found it crucial to ascertain the said information since it was deemed that such information was a clear indicator of factors that may influence one's academic performance. The analysis relied on this information of the respondents so as to categorize the different results according to their acquaintance and responses.

Table 5.1 Socio Demographic Characteristics

Socio-Demographic Variable	Characteristics	Frequency	Percentage
Gender	Male	21	42%
	Female	29	58%

(Source: survey data)

The study sought to establish the distribution by gender of the respondents in selection of the sample. It was observed that majority (58%) of the respondents were female while 42% of the sample were male. The findings shows that a majority of the respondents were female (58%), this was interpreted to mean that more females than males are admitted in higher education.

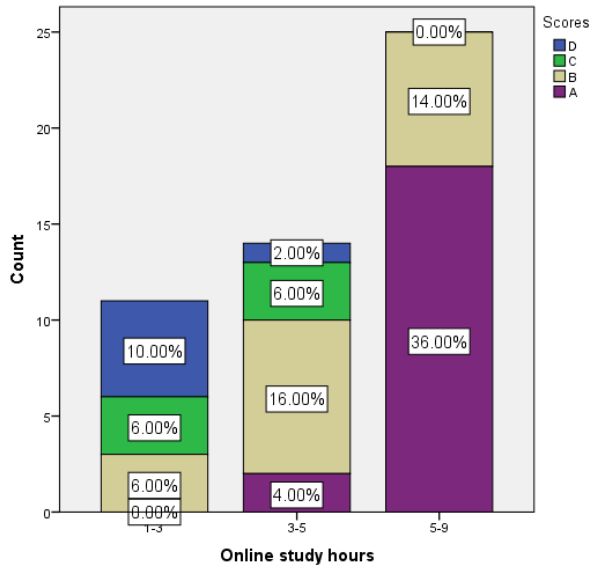
5.2 Students Average Scores

Scores	Frequency	Percentage
A	20	40%
B	18	36%
C	06	12%
D	06	12%
E	0	0%

The study sought to establish the students' average scores. The majority of the students' (40%) average score is "A". 36%, 12% and 12% of students got the average score "B", "C" and "D" respectively.

(Source: survey data)

5.3 Study Hours Impact on Academic Performance

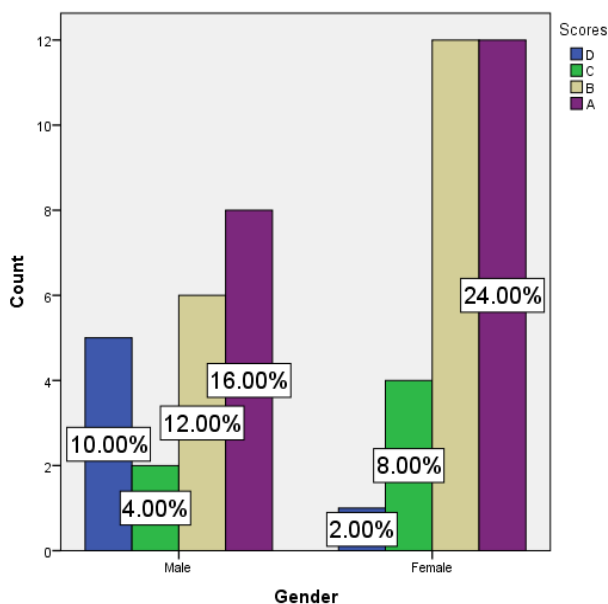


The study sought to establish the impact of study hours in a day on academic performance; it reveals that 36% and 14% of students, who scored an aggregate of “A” and “B” respectively in their studies, spend 5-9 hours in a day and 4%, 16%, 6% and 2% of students who spend 3-5 hours per day scored “A”, “B”, “C” and “D” respectively. From the revelation, it can be deduced that the more hours students spent studying the better their performance in academics.

5.4: Impact of Gender on academic Performance

The study sought to establish the impact of Socio Demographic Characteristics on average college score. It reveals that majority (24%) of students who scored an aggregate of “A” in their studies by females only 16% scored by male students. It reveals that the female students have a good academic performance than male students.

The study sought to establish the impact of Socio



5.5 Univariate analysis

Table 5.3 Descriptive Statistics (Mean, S.D)

	N	Mean	Std. Deviation
Prior_computer_skills_and_Hours_spend_in_online	50	3.5840	.53884

(Source: survey data)

Table 5.4 Descriptive Statistics (Frequency, Percent)

Range	Decision Level	Frequency	Percent
$1.0 \leq X_1 \leq 2.0$	Low level	0	0.0
$2.0 < X_1 \leq 3.0$	Moderate level	11	22.0
$3.0 < X_1 \leq 4.0$	High level	39	78.0

(Source: survey data)

The dimension of Prior computer skills and Hours spend in online has high level at its individual characteristic attribute in the academic performance (mean=3.5840). In addition, most of the respondents expressed the common opinion regarding the dimension of Prior computer skills and Hours spend in online (SD=.53884). It is noted that about 78.0% of respondents have high level of dimension attribute, while only about 22.0% of respondents have moderate level.

5.6 Inferential Analysis

The section below presents coefficient of correlation, coefficient of determination and regression coefficient. Coefficient of correlation shows the relationship between the dependent variable and the independent variables, coefficient of determination shows the contribution of independent variables to the dependent variable while the regression coefficient shows the effect of

unit increase independent variable to the independent variable.

5.6.1 Coefficient of Correlation

To compute the correlation (strength) between the study variables and their findings the study used the Karl Pearson's coefficient of correlation (r). The findings revealed that there was strong positive correlation between academic performance and Prior computer skills and Hours spend in online as shown by a correlation figure of 0.819 and the relationship between academic performance and Prior computer skills and Hours spend in online is significant and also there was a weak positive correlation between academic performance and Socio-demographic Characteristic with a correlation figure of 0.196, even though; the relationship between academic performance and Socio-demographic Characteristic is not significant.

Table 5.5 Correlations

		Socio-demographic Characteristic	Prior_computer_skills_and_Hours_spend_in_online
Scores	Pearson Correlation	.196	.819**
	Sig. (2-tailed)	.172	.000
	N	50	50

** . Correlation is significant at the 0.01 level (2-tailed). (Source: survey data)

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

5.6.2 Coefficient of Determination

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable (academic performance) that is explained by two dimensions (Prior computer skills and Hours spend in online and Socio-demographic Characteristic). From the findings, 71.3% academic performance is attributed to

combination of two dimensions (Prior computer skills and Hours spend in online and Socio-demographic Characteristic) investigated in this study. A further 28.7% academic performance is attributed to other factors not investigated in this study. Therefore, there is a dare need for further research that should be conducted to investigate the other factors (28.7%) that contribute to the academic performance.

Table 5.6 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.844 ^a	.713	.701	.552

a. Predictors: (Constant), Gender, (Source: survey data)

Prior_computer_skills_and_Hours_spend_in_online

5.6.3 ANOVA

In trying to establish significance of the model the study employed ANOVA. From ANOVA table the significance value is 0.000 which is less than 0.05 thus the model is statistically significance in

predicting how Prior computer skills and Hours spend in online and Socio-demographic Characteristic impact on academic performance. The F critical at 5% level of significance was 2.70. Since F calculated is greater than the F critical (value = 58.391), this shows that the overall model was significant.

Table 5.7 ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	35.595	2	17.797	58.391	.000 ^b
	Residual	14.325	47	.305		
	Total	49.920	49			

a. Dependent Variable: Scores (Source: survey data)

b. Predictors: (Constant), Gender, Prior_computer_skills_and_Hours_spend_in_online

5.6.4 Regression Coefficient

Multiple regression analysis was conducted as to determine the relationship between academic performance and the two dimensions.

($Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \epsilon$) becomes:

$$Y = -2.129 + 1.538X_1 + 0.415X_2$$

The regression equation above has established that taking all factors into account (Prior computer skills and Hours spend in online and Socio-demographic Characteristic) constant at zero,

academic performance will be -2.129. The findings presented also shows that taking all other independent variables at zero, a unit increase in Prior computer skills and Hours spend in online will lead to 1.538 increase in academic performance; a unit increase in Socio-demographic Characteristic will lead to 0.145 increase in academic performance. This infers Prior computer skills and Hours spend in online most to academic performance followed by Socio-demographic Characteristic contributed the least to academic performance.

Table 5.8 Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.129	.589		-3.617	.001
	Prior_computer_skills_and_Hours_spend_in_online	1.538	.146	.821	10.511	.000
	Socio-demographic Characteristic	.415	.158	.205	2.620	.012

a. Dependent Variable: Scores (Source: survey data)

6. SUMMARY OF FINDINGS, CONCLUSIONS AND RECCOMENDATIONS

6.1 Summary of Findings

The majority of the respondents in this study were female (58%), indicating that more females than males are admitted in higher learning institutions. Majority (36%) of those who studied for 5- 9 hours scored A's than who scored A's (4%) studied in 5- 3 hours.

The findings revealed that there was strong positive correlation between academic performance and Prior computer skills and Hours spend in online as shown by a correlation figure of 0.819

and the relationship between academic performance and Prior computer skills and Hours spend in online is significant and also there was a weak positive correlation between academic performance and Socio-demographic Characteristic with a correlation figure of 0.196, even though; the relationship between academic performance and Socio-demographic Characteristic is not significant.

From the findings, 71.3% academic performance is attributed to combination of two dimensions (Prior computer skills and Hours spend in online and Socio-demographic Characteristic) investigated in this study.

6.2 Conclusion

This study explains 71.3% academic performance is attributed to combination of two dimensions (Prior computer skills and Hours spend in online and Socio-demographic Characteristic). A further 28.7% academic performance is attributed to other factors not investigated in this study

This short study highlights the impact of electronic learning on academic performance of students. Many students are not well prepared to take the challenge of studying through e-learning, because of the unexpected complexities of the application of IT as a learning tool that requires commitment as there is no strict rules on the learning times.

The perception is that the world has become smaller as a result of the immense progress made in the field of information and communication technologies. IT is accessible to all across the continents and the oceans through the satellites, cables, and other such devices that have made man more independent and have increased his mobility by making distances shorter and communication faster.

As the analysis of data gathered on a small sample of a fifty pupil, has shown that, there are still many issues that need to be closely considered before we can safely state that e-learning and other related learning methods have contributed to the enhancement of the performance of students at the higher levels of our education system, irrespective of individual differences due to heredity and/or environment. It can be confidently said that there is still a long way to go before we can make the whole world harvest the benefits from the progress of science and technology.

6.3 Recommendations for Further Reading

This research elicited and examined a number of extreme points of views about the impact of E-learning on academic achievement. Although it was discovered that certain issues have not yet been properly addressed to E-Learning

implementation processes, as the prime focus of the research was on prior computer skills, number of hours individual spend studying and socio-demographic characteristics. The following are the recommendations of this study:

- I. Critical factors such as institutional issue, management issue, pedagogical factors, technological issue, interface design issue, evaluation issue, and resource support issue and the factors within each issue have not yet been investigated with detail coverage.
- II. The need to carry out detail research involving case studies based on survey questionnaires involving various learning institutions which will ultimately give a better understanding of impact of e-learning aspects within implementation process.

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