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The Role of Socio-Demographic Characteristics on Academic Achievement

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Abstract

The importance of education is increasing because of increasing pressure to catch up with the developed world regarding, for example, global competitiveness (Hawkins 2002). Before the introduction of e-learning many people who wanted to obtain university degree had to compete for the few places that were offered by the public universities. Those offered places had to apply for study leave as they had to go through the traditional learning system. This kind of further education system was characterized by limited number of students that could be absorbed per an academic year and consequent removal from their places of work for the duration of their study. From the reviewed literature, it can be deduced that there seems to be no research studies on the joint contributions of e-learners' socio-demographic, hours spent online/offline and prior computer skills variables to their academic performance. Whereas, researchers and theorists (Coldeway, 1986; Calvert, 1986; Garrison, 1987; Kumar, 2001) have stressed the need for a comprehensive approach, taking into account all the experiences of e-learners as well as the unique aspects of e-learning environment. In addition, it has also been observed that little research has been devoted to exploring factors that predict the academic performance of e-learners (Cookson, 1989) while those that even exist concentrated largely on demographic correlates as a component in their studies (Kumar, 2001). Several studies have been carried out on academic performance especially on conventional students, but not much on e-learning students within the Kenyan educational system. The need to sever this ground so as to extend the frontier of knowledge in order to help improve the unimpressive e-learners' academic performance necessitates and serves as the motivating factor for undertaking the present piece of research so as to fill the existing important research gap.

Keywords: E-Learning, Academic Performance, IT Education

1. INTRODUCTION

Web Based Training and its newer and more general synonymous term e-Learning are two of today's buzz-words in the academic world. Decision-makers associate with its new ways of learning that are more cost efficient than traditional learning strategies and which allow students to better control the process of learning because they can decide when, where and how fast to learn. The emergence of e-leaning has tremendously transformed information – handling and management in academic environments (Ani and Ahiauzu, 2008). A number of e-learning initiatives have been put in place to assist in the development training and use of electronic resources in a number of academic institutions. These initiatives notwithstanding, some inadequacies in the development provision and utilization of electronic resources have been identified in a number of academic institutions. A number of studies have been made with a view to proffering solutions to problems encountered in the development of electronic information resources. However, little or no efforts have been recorded in the identification of influence and impact of e-learning on academic performance of student in higher learning institutions.

2.0 BACKGROUND OF THE STUDY

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&Waalen, 2002), level of educational attainment, number of children in the family, full-time work experience, family income level (Abdul-Rahaman, 1994; Parker, 1994; Whittigton, 1997), age, marital status, employment status (Woodley & Parlett, 1983; Chacon-Duque,1985; Powell, Conway & Ross, 1990), number of hour employed per week, distance traveled to study centre, learners' previous educational level (Wang & Newlin, 2002).

Studies above established divergent findings. For example, for first year programming courses, Thomas, Ratcliffe, Woodbury and Jarman (2002) reported that there was a relationship between student learning style and academic performance, while Byrne and Lyons (2001) established that no such relationship exists. Also, Woodley and Parlett (1983) found that previous educational level, gender, age and occupation were associated with persistence and academic performance. Similarly, Powell et al. (1990) established that marital status, gender and financial stability contributed significantly to distance learners' academic performance. Conversely, Chacon-Duque (1985), Wang and Newlin (2002) and Ergul (2004) found that educational level, age, gender, employment status and number of children in the family were not significant predictors of distance learners' academic performance. Based on the findings from above studies on the relationship between socio-demographic characteristics and academic performance, it appears the issue remains inconclusive.

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.

Li (2002) observed that, female students tend to initiate conversations, while male students are more likely to enter the dialogue at later stages and respond to previous discussions. Individual metacognitive factors are also implicated in student success as Karsenti (2001) points to the relevance of self-direction and self-regulation in university students, concluding, "The main difficulty encountered by students seemed to be their lack of autonomy or the trouble they had in learning by themselves, in managing their own learning" (p. 33).

2.1 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.

The ability to effectively manage learning time is an important element in of electronic learner success (Kearsley, 2000). Palloff and Pratt (1999) hinted that interacting in a Web-based course can require two to three times the amount of time investment than in a face-to-face course. Roblyer (1999) pointed that students who have difficulty managing time are more likely to achieve less in a distance course or drop out altogether. Gibson (1998) pointed out that a key construct relating to distance learners' persistence is their self-efficacy for learning at a distance and that personal perceptions of competence (self-efficacy) are related to learners' perceptions of their ability to manage time effectively.

Students who use their time efficiently are more likely to learn and/or perform better than students who do not have good time management skills. Zimmerman and Risemberg, (1997) opine that self-regulated learners know how to manage their time because they are aware of deadlines and how long it will take to complete each assignment. They prioritize learning tasks, evaluating more difficult from easier tasks in terms of the time required to complete them. They are aware of the need to evaluate how their study time is spent and to reprioritize as necessary.

The other key performance-influencing issue relates to differences in student learning styles. These may result in differences in the effectiveness of e-learning delivery methods for individual sub-groups within the student body. Within the learning-styles literature the notion that different learners have different cognitive styles has been widely examined (Klob, 2000). In addition to be general indication, there is a considerable support in the literatures for the suggestion that there are identifiable variations in the learning styles of sub-groups within the student population

3.0 METHODOLOGY

This chapter describes the methods that were used in the study. It explains the research design, the study population, sampling method and procedures, data collection procedures and instruments, data analysis, reporting and ethical issues.

3.1. Research Design

The research design was an analytical survey. Analytical surveys also referred to as diagnostic studies attempt to describe and explain *why* certain situations exist. In this approach two or more variables are usually examined to test research hypotheses. The results allow researchers to examine the interrelationships among variables and to draw explanatory inferences. In this study, the researcher sought to establish the relationship between prior computer skills; socio-demographic characteristics; and level of student engagement effect on academic attainment.

3.2 Unit of Analysis

According to Mugenda and Mugenda (2003) units of analysis are units that are designed for purposes of aggregating their characteristics in order to describe some larger group or abstract phenomenon. Nachmias and Nachmias (1996) describe the units of analysis as the most elementary part of the phenomenon to be studied. To Singleton et.al (1988; 69) they are "what or whom to be analyzed". In this study, the unit of analysis was the different categories discussed in this paper as the 'study modes' (e-learning and conventional).

3.3 Unit of Observation

The unit of observation in this study was the individual students whose performance was aggregated to inform category performance.

3.4 Study Population

In this study, the population of interest is beneficiaries of the 1500 computers that were provided by ComputerAid international. Each computer was to be used by five e-learning students. The total population of the beneficiaries is (1500 * 5) 7500 students. An equivalent population was targeted for students under the conventional learning mode so as to avoid overrepresentation of one category. The total population in this study was thus fifteen thousand, (7500 * 2 = 15000) being seven thousand five hundred on the e-learning program and seven thousand five hundred on the conventional study mode. From the total population, a sample of one hundred and fifty students' constituting seventy-five on e-learning mode and seventy-five on the conventional study mode was targeted. This is a total sample population of 150 which is 1 percent of the total population. The sample 75 for each category was guided by Dr. John Curry Professor of Educational Research, North Texas State University (now retired), who provided his

research students (fall, 1984) with the "rule of thumb" on sampling (Gay, 1987) presented in the table 3.1 below. The sample size was also deemed appropriate when it was noted that the beneficiaries of the group learning sets are spread across the country, time and finances did not allow for inclusion of a bigger number. On the same note, in the bid to have equal representation, the number seventy-five was settled for students under traditional learning mode.

Table: 3.1 Population sample size

Size of population	Sampling percent
0-100	100%
101-1,000	10%
1,001-5,000	5%
5,001-10,000	3%
10,000+	1%

Source Gay (1987)

3.5 Sampling Method and Procedures

Through a systematic random sampling procedure where a neutral start point was identified by the researcher where the first student was identified randomly, within the study location. It was key to consider gender parity in the study, as such for those under conventional study mode, if a male student was picked the next was to be a female respondent. Identification of the starting point was done at the gate of Kenyatta University, the data collection was done on one side of the road towards the administration block, upon reaching the administration block, and the other side of the road was taken towards the gate. After identification of the first respondent, five students were past then the sixth was included in the study, if the sixth student was not of the opposite gender, five more students were past till the opposite gender was found. The process was repeated until seventy-five respondents were interviewed.

To identify e-learning respondents, a list of students was obtained from the institution, systematic random sampling was then used to select seventy-five students. A starting point was first randomly picked then every fifth name in the list was included in the sample. Questionnaires were then sent online to the selected seventy-five students.

3.6 Data Collection Procedures and Instruments

The main instrument of data collection in this study was questionnaires. The items in the questionnaire were structured (closed ended) and unstructured (open ended). The structured questions measured the subjective responses to clarify the objective responses and at the same time, enhance formulation of recommendations of the study. The researcher used trained research assistants to collect data.

3.7 Data Analysis and Reporting

According to Miles and Huberman (1994) data analysis is an iterative process. Data analysis consists of three activities: Data reduction, Data display, and Conclusion drawing/verification". Data reduction, this process is applied to qualitative data and focus remains on selection, simplification and transformation of data. In this continuous process the data is organized throughout the research to draw and finalize a conclusion (Miles and Huberman, 1994). In this research, the data was reduced from critical elements in implementation of E-learning to students' academic performance. In data display the data is displayed in an organized form or the data has to be put into an order to easily draw the conclusion. Tables and graphs are used to indicate distinct frequencies of various factors of E-learning implementation and academic performance.

4.0 DATA ANALYSIS
4.1 Inferential Analysis

The section below presents coefficient of correlation, coefficient of determination, ANOVA 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, ANOVA tests the significance of the regression model while the regression coefficient shows the effect of unit increase independent variable to the independent variable.

4.2 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 as shown in Table 4.1 below revealed that there was a positive correlation between academic performance and hours spent online as shown by a correlation figure of 0.557, even though the correlation is positive, the relationship between academic performance and hours spent online is not significant. It was also clear that there was a positive correlation between academic performance and gender with a correlation figure of 0.512, even though the correlation is positive, the relationship between academic performance and gender is not significant. It was also revealed that there was a positive correlation between academic performance and location of setting with a correlation figure of 0.52, likewise even though the correlation is positive, the relationship between academic performance and location setting is not significant. Finally, a positive correlation between academic performance and subject with a correlation value of 0.538 was realized. Even though the correlation is positive, the relationship between academic performance and subject is not significant. This shows that there was a moderate correlation between academic performance and hours spent online, gender, location setting and subject. The lack of significance in the individual relationships could be due to interactive effects with the other variables.

Table 4.3 Coefficient of Correlation

		Academic Performance	Hours spent online	Gender	Location setting	Subject
Academic Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
Hours spent online	Pearson Correlation	0.557	1			
	Sig. (2-tailed)	0.3079				
Gender	Pearson Correlation	0.512	.320	1		
	Sig. (2-tailed)	0.1855	0.0194			
Location setting	Pearson Correlation	0.520	0.1846	0.1107	1	
	Sig. (2-tailed)	0.0023	0.1857	0.4300		
Subject	Pearson Correlation	0.538	0.0072	0.2335	0.1027	1
	Sig. (2-tailed)	0.0422	0.9591	0.0925	0.4642	

4.2 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 all the five independent variables (hours spent online, gender, location setting and subject). From the findings, 54.5 percent academic performance is attributed to combination of the four independent factors (hours spent online, gender, location setting and subject) investigated in this study. A further 45.5 percent 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 (45.5 percent) that contribute to the academic performance.

Table 4.4 Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.738	0.545	0.214	0.160

4.3 ANOVA

In trying to establish significance of the model the study employed ANOVA. From table 4.3 the significance value is 0.009 which is less than 0.05 thus the model is statistically significance in predicting how hours spent online, gender, location setting and subject impact to academic performance. The F critical at 5 percent level of significance was 2.70. Since F calculated is greater than the F critical (value = 9.793), this shows that the overall model was significant.

4.4 Regression Coefficient

Table 4.5: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.624	4	3.156	9.793	.009
	Residual	30.616	95	.322		
	Total	43.240	99			

a. Predictors: (Constant), Action in-case of computer complication, Difficulty in using computers, Study hours in a day, Mode of study

b. Dependent Variable: Average score for college courses

Multiple regression analysis was conducted as to determine the relationship between academic performance and the four variables. As per the SPSS generated table 4.4 the equation

$(Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon)$ becomes:

$Y = 1.180 + 0.0498 + 0.017 X_2 + 0.3209 X_3 + 0.2527 X_4$

The regression equation above has established that taking all factors into account (hours spent online, gender, location setting and subject) constant at zero, academic performance will be 1.180. The findings presented also shows that taking all other independent variables at zero, a unit increase in hours spent online will lead to a 0.0498 increase in academic performance; a unit increase in gender will lead to a 0.017 increase in academic performance; a unit increase in location setting will lead to a 0.3209 increase in academic performance and a unit increase in subject will lead to a 0.2527 increase in academic performance. This infers that location setting contribute most to academic performance followed by subject then hours spent online while gender contributed the least to academic performance.

Table 4.6: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	**Std. Error**	**Beta**		
(Constant)	1.180	0.3303		0.5449	0.5881
Hours spent online	0.541	0.1530	0.0498	0.3731	0.0201
Gender	0.507	0.1658	0.0170	0.1210	0.0262
Location setting	0.518	0.1502	0.3209	2.4461	0.0252
Subject	0.528	0.1398	0.2527	1.9406	0.0223

4.0 CONCLUSION

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.

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:

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.

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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