

# AN ECONOMETRIC ASSESSMENT OF FACTORS THAT PREDICT ACADEMIC PERFORMANCE OF TERTIARY STUDENTS IN HO, GHANA

**James Dickson Fiagborlo, Ho Polytechnic**  
**Etornam K. Kunu, Ho Polytechnic**

## ABSTRACT

*This study seeks to access the demographic, student specific and lecturer specific characteristics that predict academic performance of tertiary students in Ho, Ghana. A descriptive, cross-sectional survey was conducted among 350 randomly selected students of Ho Polytechnic. Logistic regression analysis was used to identify the predictors of academic performance of tertiary students in Ho, Ghana. The results show that four demographic characteristics, five student specific characteristics and five lecturer specific characteristics were significant in predicting academic performance of tertiary students in Ho, Ghana. It is suggested therefore that, identifying these factors such a punctuality and regularity of both students and lecturers to class and ensuring that materials that lecturers present to students are very clear and understandable by all students, that lecturers monitor students' progress of learning through constant assignments and quizzes and that students academic affairs understand that the time students spend participating in extra curriculum activities impacts on their grades, should be the best policy option for all stakeholders who are interested in higher academic performance in tertiary schools in Ho.*

**Keywords:** *Academic performance, Predict, tertiary students, logistic regression*

## INTRODUCTION

Education is the best legacy a nation can give to her citizens. This is because the development of any nation or community depends largely on the quality of education. Education also helps individuals to grow, develop, earn a decent living in the society and contribute positively to the welfare of the society. It is generally believed that the basis for any true development must commence with the development of human resources. Efficient human resource could also be considered a reliable tool for poverty reduction apart from its direct effect on increasing knowledge, building skills, values and attitudes and opening up people for critical thinking.

Formal or informal education continues to shape the three domains of human development. These are the cognitive, affective and the psychomotor domains. Formal education remains the vehicle for social-economic development and social mobilization in any society. Therefore, tertiary education must be of a quality that will help the individuals to acquire skills, knowledge, values and attitudes that will enable them to contribute positively to the social, economic, political and moral development of the society.

Battle and Lewis (2002) opined that higher education plays a vital role in the development of human capital, which is linked with an individual's well-being and opportunities

for better living. It could also be considered to be a reliable tool for poverty reduction apart from its direct functions of increasing knowledge, building skills, values and attitudes and opening up people for critical thinking. Education is about knowledge in basic skills, academics, technical and discipline. This is possible through the measure of performance because only what can be measured will be selected and the measuring tool is the written test or exam.

Society places great emphasis on education because it is believed to be the only avenue for national development. However, this can only be achieved if students' who are in the citadel of learning get actively involved in academic activities which will enhance their academic performance. Academic performance is defined or regarded as participants' examination grades at the end of a given duration (term, semester and programme). It could also be seen as the level of performance in a particular field of study. Higher scores indicate better academic performance (Egbule, 2004). In Ghana, most tertiary institutions measure student's performance using the grade point average (GPA). This measure tells the semester-by-semester output of the students throughout the program until final CGPA, cumulative grade point average, is determined.

Ali et al., (2009) posited that students' academic performance plays an important role in producing the best quality graduates who will become great manpower and leaders for the social development of a country. The quality of students' performance remains as a top priority for educational institutions. In spite of these, Egbule (2004) showed that students' academic performance has been declining. This could be due to the fact that they are confronted with so many school and non-school related demands and responsibilities. Many educators, trainers and researchers have long been interested in exploring variables that contribute effectively to quality performance of learners. Some researchers posited that the variables that affect quality academic achievement are inside and outside school (Crosnoe, Johnson & Elder, 2004).

Luguterah and Apaw (2013) determined the factors that influence students' academic performance in Ghanaian Polytechnics. Their findings revealed that students' academic performance is affected by a change in academic levels. Thus a given semester and age of students have a negative effect on the academic performance of the students as they tend to perform poorly with increasing number of credit hours and increased age. The researchers also indicated that students who were admitted through direct entry perform better academically compared with those who were admitted based on the matured entry requirement. According to the researchers, gender and the department of students also significantly determine the academic performance of students in the Polytechnic.

Again, researchers have identified and attributed a myriad of factors to low academic performance. These factors include: poor teaching environment (Mitzel, 1969); parents' low socioeconomic status (Sewell et al, 1980); gender bias (Gyeke-Nimako, 1983); poor parenting (Wilson & Hermstein, 1985); large sibling size (Becker & Tomes, 1985); and poor family socialisation (Friedrich, 1995). Though these factors have been found to contribute to poor performance, it is not known which of these equally predict students' academic performance in tertiary schools in the Ho Municipality. It is, therefore, imperative to assess which of the said factors will predict academic performance of tertiary students. This is the gap that this paper seeks to fill by answering the following question: What factors actually best predict the academic performance of tertiary students in the Ho Municipality? The study will enable policy makers and stakeholders in the educational sector to understand the factors that predict the academic performance of tertiary students and mitigate the effects of these factors on students' performance in the Ho Municipality in particular and Ghana in general

The remainder of the paper is organised as follows: In Section 2, we consider the review of literature and briefly discuss the data collection procedures in section 3. Section 4 explains our analytical framework and estimation procedures, after which the empirical analysis and results are discussed in section 5. In Section 6, consideration is given to the concluding remarks and recommendations.

## LITERATURE REVIEW

A lot of models have been developed to explain the relationship between the teaching environment and the school performance of pupils. The classroom teaching model developed by Mitzel (1969); explicit teaching model by (Rosenshine, 1986); and the cultural relevant practice model by (Irvine, 2004; Moody, 2004; Love & Krueger, 2005) are some of the models in the literature. The classroom teaching model was to establish and expound on the variables that affect academic performance.

In 1986, Rosenshine developed an explicit instruction to enhance the teaching methods of less-effective teachers and suggested that, for a teacher's teaching to be explicit, the purpose or goals of lessons should be stated, students' memories should be refreshed with previous lessons, and new materials should be presented and explained in small steps, with students practising each step. Explicit teaching also makes it incumbent for teachers to ask students questions, check for their understanding, obtain responses from them and monitor them during lessons (Carnine, Silbert, Kame'enui, Tarver & Jungjohann, 2006).

Moody (2004); Irvine (2004) and Love and Krueger (2005) established the cultural relevant practice and admonish African-American teachers to incorporate caring attitudes and mothering skills in their teaching practices. The authors encouraged teachers to demonstrate a strong belief in students, demand for students' best, ensure balanced discipline in teaching, adopt the teaching profession as a calling and use other effective practices in teaching students.

Love and Krueger (2005) also admonish teachers to regard their position in the community as a spiritual calling and provide their students on a regular basis with opportunities to learn collectively and cooperatively. Teachers were also implored by the authors to make few assumptions about students' prior knowledge and view teaching as an art and as giving back to the community. The writers stress that teachers should ensure that knowledge is reciprocal and encourage critical thinking skills among students

In terms of Factors influencing academic performance, several researches have been carried out in diverse parts of the world to account for either high or low academic performance. For examples, Stevens, Hough and Nurss (1993) studied the effects of single parenthood on children's school attainments and vocational training in West Germany; Friedrich (1995) asserts that family socialisation is a factor that influences children's academic performance; Sewell, Hauser and Wolf (1980) in their studies suggest that children, who come from families with better education, obtain more years of schooling than children who come from families with little or no education.

The work of Peraita, Carlos, Pastor and Margarita (2000) in Spain revealed that low test scores, school attendance and high school dropout rates are common with pupils whose parents' educational background is low. Haveman and Wolfe (1994) hypothesise that parents' education is important in predicting children academic achievement. Teachman, Paasch and Caver (1997) postulate that parents' human capital is important in determining their children's education; According to Odaga and Heveveld (1995), socio-cultural expectations of girls and the priority given their future roles as mothers and wives have strong negative bearings on their formal

educational opportunities. These socio-cultural anticipations influence parents' decisions to withdraw their daughters from school and also influence the girls' decisions to drop-out of school, which, in turn, have a negative impact on their academic performance and grade level attainment.

In sum, the literature review uncovered number of factors that influence students' academic performance. According to the literature, the dominant factors that influence academic performance have been parent specific; student specific; teacher specific and above all, socio-cultural in character. The literature review also revealed some models that have been developed to explain the relationship between the teaching environment and the school performance of pupils. Specifically, the classroom teaching model developed by Mitzel (1969); explicit teaching model by (Rosenshine, 1986); and the cultural relevant practice model by (Irvine, 2004; Moody, 2004; Love & Krueger, 2005) are some of the models in literature. We have no reason to doubt the relevance of these factors and models to this present paper.

### A BRIEF DISCUSSION OF THE DATA COLLECTION PROCEDURES

This study used cross-sectional study design. The area of study was the Ho Polytechnic in Volta Region, Ghana. At Ho Polytechnic, there are five faculties- Applied Social Sciences, Applied Sciences and Technology, Business and Management Studies, Engineering, and Art and Design. Our study target population was registered students studying tertiary courses at various stages in Ho Polytechnic. The total number of registered tertiary students as of the time of the study was 4,159, which was made up of 2,676 males and 1,483 females respectively (Planning & Quality Assurance Unit Ho Polytechnic, 2015).

In order to draw inference from a sample that will accurately reflect the population, careful attention was paid to the determination of the needed sample size. In all, a total sample of 350 was drawn from the target population. Since the target respondents appear to be heterogeneous in nature or departmentalised, the selection of the 350 response units from each group was determined by using proportional representation formula, where  $n_i$  denote the number of samples to be selected from a department  $i$ ;  $N_i$  denote the total number of students in department  $i$ ; and  $N$ , the total population. The summary of the sampling results are shown in Table 1.

<b>Department</b>	<b>Number of Students</b>	<b>Proportional representation</b>
Statistics	11	3
Hospitality & Tourism Management	336	79
I. C. T.	8	2
Computer Science	3	1
Agro-Enterprise Development	7	2
Industrial Art	7	2
Fashion Design & Modelling	163	38
Banking & Finance	60	14

Purchasing & Supply	65	15
Accountancy	342	81
Marketing	229	54
Secretaryship	220	52
Agriculture	8	2
Civil Engineering	0	0
Building Technology	6	1
Electrical/ Electronic Engineering	12	3
Automobile Engineering	4	1
Production Engineering	2	0
Oil & Gas Engineering	0	0
Multidisciplinary Studies	0	0
Applied Modern Languages	0	0
<b>Total</b>	<b>1483</b>	<b>350</b>

Source: Planning & Quality Assurance Unit, Ho polytechnic

The study employed a simple random sampling technique to identify the respondents in each department. To arrive at the sample, a sampling frame provided by each course representative from a list of students was obtained. A list of random numbers was then assigned to all elements in the sampling frame. Numbers were then picked randomly from the random table designed. This process continued until the required number of respondents was achieved in all departments. The structured interview schedule was employed to collect the data because it costs less and offers the possibility of higher response rate. It is also possible to generate both qualitative and quantitative data from respondents. The data were collected to reflect the exact objectives of the study. The interview schedule had three sections.

The first section consisted of demographic characteristics (sex, age, educational level, income and marital status) of lecturers. The second section consisted of school specific attributes. The last section dealt with student's specific attributes. The structure of questions in the instruments was a combination of open-ended and close-ended questions. The survey, which spanned across four weeks, was done in December, 2015. Three hundred and fifty questionnaires were administered. All interviews were personal where the questions were read aloud to the respondents in English. The respondents were visited in their lecture halls during teaching hours. If the respondents could not answer questions because of time, they were visited later to complete the schedule.

## **ANALYTICAL FRAMEWORK AND ESTIMATION PROCEDURES**

A binary logit model was considered for the estimation of individual student's academic performance. We assume individual student's academic performance is dichotomous, high or low. Suppose the binary variable  $Y = (0, 1)$  denotes the academic performance of the individual student. Let  $y=1$  if and only if the individual student performs highly and  $y=0$  if otherwise (i.e. performs lowly). The probability of high academic performance of student is expressed as

$$p_i = (y = 1 | x_i) = \frac{\exp(x_i \beta)}{1 + \exp(x_i \beta)} \quad 1$$

Where  $X_i \beta = \beta_1 + \beta_2 X_2 \dots \beta_k X_k$

Equation (1) indicates that the probability of not having higher academic performance can be stated as:

$$1 - p_i = \frac{1}{1 + \exp(x_i \beta)} \quad 2$$

We can, therefore write

$$\frac{p_i}{1 - p_i} = \exp(x_i \beta) \quad 3$$

By taking the natural log of equation (3) we obtain the logistic function

$$L_i = \ln \left( \frac{p_i}{1 - p_i} \right) = \alpha + \beta X_i + \varepsilon_i \quad 4$$

Where  $\ln$  = natural logarithms;  $P_i$  = Probability of achieving high academic performance, defined in terms of cumulative logistic probability function;  $(1 - P_i)$  = Probability of achieving low academic performance;  $X_i$  = vector of explanatory variables;  $\varepsilon$  = Random disturbance term;  $[\alpha, \beta]$  are the intercept and slope parameters to be estimated.

The empirical model for estimating high academic performance is specified as:

$$\ln \left( \frac{P_i}{1 - P_i} \right) = \beta_0 + \beta_1 \text{democh} + \beta_2 \text{stusch} + \beta_3 \text{lecsch} + u_i \quad 5$$

Where *demch* is demographic characteristics of respondents, *stusch* is student specific characteristic, *lecsch* is lecturer specific characteristic and  $u_i$  is the error term. The expected signs of the coefficients are:  $\beta_1 > 0$ ,  $\beta_2 > 0$ ,  $\beta_3 > 0$ ,  $\beta_4 > 0$ .

It is easy to verify that as  $x' \beta$  ranges from  $-\infty$  to  $+\infty$ ,  $P(x)$  varies from 0 to 1 and that it relates nonlinearly to  $x' \beta$ . This specification, however, poses estimation problems because  $P(x)$  is non-linear not only in the regressors but also in the parameters as could be seen from (1). This means that we cannot use the familiar Ordinary Least Square (OLS) procedure to estimate the parameters. The commonly used technique for estimating models with binary dependent variable such as logit is the Maximum Likelihood Estimation (MLE).

This technique is employed to estimate the parameters in our logistic regression models. The method of the maximum likelihood consists of estimating the unknown parameters in such a manner that the probability of observing the dependent variable is as high (maximum) as possible (Gujarati, 2006). It is possible to show that unique maximum exist for the binary logit model. Pindyck and Rubinfeld (1991) argued that Maximum Likelihood Estimation yields consistent parameter estimators. Thus, the MLE would produce the most likely value to the parameters given our sample data. The odd ratios of the explanatory variables and their connections with the dependent variable were also determined after estimation of the parameters. These enabled us identify the variables that have the greatest influence on students' academic performance.

## EMPIRICAL ANALYSIS AND RESULTS

This subsection looks at the summary statistics of the respondents. A total of 350 students completed the questionnaire. Table 2 summarizes the socio-demographic information of the respondents. Out of the 350 respondents 54.6% of them were male and 45.4% were females. Also 61.7% of the respondent were between the ages of 18 and 25, 33.3% of them are between 26-35 age group and 4.0% were in 36-45 age group. The analysis further revealed that about 68.9% of the respondents were never married, 27.7% of them were married whiles the rest 3.4% of them were divorced.

Variables	Frequency	Percentages
<b>Gender</b>		
Male	191	54.6
Female	159	45.4
<b>Age</b>		
18-25	216	61.7
26-35	120	33.3
36-45	14	4.0
<b>Marital Status</b>		
Never Married	241	68.9
Married	97	27.7
Divorced	12	3.4

*Source: Field data (2016)*

### DEFINITION OF DEMOGRAPHIC CHARACTERISTICS

- DC1= Age of student
- DC2= Class size and composition
- DC3= Lack of convenient learning environment
- DC4= Low economic status of parents
- DC5= Poor parental involvement
- DC6= Family responsibility of students
- DC7= Peer influence
- DC8= Availability of school infrastructure and materials
- DC9= Extra curriculum activities

**Table 3**  
**LOGISTIC REGRESSION ESTIMATES OF DEMOGRAPHIC CHARACTERISTIC PREDICTING ACADEMIC PERFORMANCE**

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
							Lower	Upper
DC1	0.022	0.129	0.028	1	0.867	1.022	0.794	1.315
DC2	0.019	0.117	0.025	1	0.873	1.019	0.810	1.281
DC3	<b>-0.257</b>	0.113	5.144	1	<b>0.023</b>	0.774	0.620	0.966
DC4	0.087	0.123	0.502	1	0.479	1.091	0.857	1.390
DC5	<b>-0.338</b>	0.130	6.805	1	<b>0.009</b>	0.713	0.553	0.919
DC6	<b>0.323</b>	0.092	12.297	1	<b>0.000</b>	1.382	1.153	1.655
DC7	-0.094	0.130	0.527	1	0.468	0.910	0.706	1.173
DC8	0.106	0.152	0.488	1	0.485	1.112	0.826	1.497
DC9	<b>-0.317</b>	0.146	4.735	1	<b>0.030</b>	0.728	0.547	0.969
Constant	1.963	0.750	6.844	1	0.009	7.121		

Source: Field data (2016)

The Wald statistics and the significance level in Table 3 show that four out of the nine independent variables namely; “DC3= Lack of convenient learning environment”, “DC6= Family responsibility of students”, “DC5= poor parental involvement”, and “DC9=Extra curriculum activities” were significant in the prediction of academic performance in Ho, Ghana. This is because they had p-values values of less than 0.05 (sig. in Table 2).

This observation confirms assertions of Christenson and Gorney (1992) that family and environmental factors affect students’ achievement. In addition, the findings are not different from Ryan (2000) that associating with friends who have positive effect towards school enhanced students’ own satisfaction with school, whereas associating with friends who have negative effect towards school decreased it.

Thus the logistic function is given by the equation (2) below:

$$P(\text{Academic Performance}) = \frac{1}{1 + e^{-(1.963 - 0.257DC3 + 0.323DC6 - 0.094DC7 - 0.317DC9)}}$$

Furthermore, the odd ratio ( $Exp(\beta)$ ) for the significant factors, shows the increase (or decrease if the ratio is less than one) in odds of being in one outcome category (turnover or no turnover) when the value of the predictor increases by one unit. From table 2, the odds or risk of 0.774 for DC3 (Lack of convenient learning environment) indicate that students who study in a convenient learning environment were 0.774 times more likely to have high academic performance as compared with those who lack convenient learning environment, ceteris paribus. The odd ratio for DC6 (Family responsibility of students) also indicate that, ceteris paribus, students who have and performs family responsibilities were 1.382 times more likely to have low academic performance as compared to those who do not have nor perform any family responsibility. For DC5= poor parental involvement, the odd ratio of 0.713 means that students whose parents do not take interest in their academic activities were 0.713 times less likely to have higher academic performance as compared with those whose parents take interest in their academic affairs, all else being equal.



Finally, the odd ratio for *DC9 (Extra curriculum activities)* means that students who participate more in extra curriculum activities were 0.728 times more likely to have low academic performance as compared with those who do not partake in any extra curriculum activities, *ceteris paribus*.

**DEFINITION OF STUDENTS SPECIFIC CHARACTERISTICS**

- SSC1= Lack of adequate effort and self confidence
- SSC2= Punctuality and regularity of student to lectures/class
- SSC3= Study habits
- SSC4= Being addicted to drinking, smoking, night clubs etc
- SSC5= Long hours spend on social network like facebook and whatsapp
- SSC6= Poor attitude towards courses
- SSC7= Ability to attend library and do more research
- SSC8= Test and Examination Anxiety
- SSC9= Ability to understand course materials and curriculum

	B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B)	
							Lower	Upper
SSC1	<b>0.328</b>	0.211	2.408	1	<b>0.002</b>	1.388	0.917	2.100
SSC2	<b>-0.914</b>	0.221	17.064	1	<b>0.000</b>	0.401	0.260	0.619
SSC3	0.107	0.173	0.384	1	0.535	1.113	0.793	1.564
SSC4	0.008	0.179	0.002	1	0.962	1.008	0.709	1.434
SSC5	-0.180	0.169	1.138	1	0.286	0.835	0.600	1.162
SSC6	<b>-0.240</b>	0.105	5.158	1	<b>0.023</b>	0.787	0.640	0.968
SSC7	<b>0.246</b>	0.109	5.136	1	<b>0.016</b>	1.279	1.034	1.582
SSC8	0.219	0.193	1.287	1	0.257	1.245	0.853	1.817
SSC9	0.158	0.179	0.776	1	0.378	1.171	0.824	1.665
Constant	1.340	0.847	2.502	1	0.114	3.819		

Source: Field data (2016)

The Wald statistics and the significance level in Table 4 show that four out of the nine independent variables namely; “*SSC1=Lack of adequate effort and self-confidence*”, “*SSC2=Punctuality and regularity of student to lectures/class*”, “*SSC6=Poor attitude towards courses*”, and “*SSC7= Ability to attend library and do more research*” were significant in the prediction of academic performance in Ho, Ghana. This is because they had p-values values of less than 0.05 (sig. in Table 3).

This finding support Allen-Meares, Washington, & Welsh (2000) study that poor attendance such as truancy or unexcused absence from school, cutting classes, and tardiness is important in deterring pupils’ academic achievement. House (1997) and Hassan (2002) also complemental the results with their findings that pupils’ initial attitude towards school and course is significantly related to academic performance.

Thus the logistic function is given by the equation (2):

*P(Academic Performance)*

$$= \frac{1}{1 + e^{-(1.340+0.328SSC1-0.914SSC2-0.240SSC6+0.246SSC7+0.158SSC9)}}$$

Regarding the odd ratio ( $Exp(\beta)$ ) for the selected student specific characteristics, *SSC1 (Lack of adequate effort and self-confidence)* indicates that students who did not put in adequate effort and lack self-confidence were 1.388 times more likely to have lower academic performance as compared with those who puts in adequate effort and have self-confidence, all else being equal. For *SSC2 (Punctuality and regularity of student to lectures/class)*, the odd ratio indicates that students who are not punctual and regular to lectures were 0.401 times more likely to have low academic performance as compared with those who are punctual and regular to lectures, all else being equal. Also the odd ratio for *SSC6 (Poor attitude towards courses)* means that, all else being equal, students who develops poor attitude towards course were 0.787 time more likely to have lower academic performance as compared with those develop positive attitude towards courses.

Furthermore, for *SSC7 (Ability to attend library and do more research)*, the odd ratio of 1.279 indicated that, all else being equal, students who normally attend library and do more research are 1.279 times more likely to have higher academic performance as compared with students who do not attend library and do more research. Finally, the odd ratio for *SSC9 (Ability to understand course materials and curriculum)*, although not significant at 5 percent, means that, all else being equal, students who make sure they understand course materials and curriculum were 1.171 times more likely to have higher academic performance as compared with those who do not make any effort to understand course materials and curriculum, all other factors being equal.

**DEFINITION OF LECTURER SPECIFIC CHARACTERISTICS**

- LSC1= Clarity of lecture presentation
- LSC2= Lecturer’s attitude towards students
- LSC3= Availability of instructional aids
- LSC4= Ability to hold the attention of students during lecture hours
- LSC5= Encouragement of discussions and question during lecture hours
- LSC6= Continuous monitoring of progress of learners through assignments and exercises
- LSC7= Lecturer commitment to teaching
- LSC8= Content of curriculum and methods of teaching
- LSC9= Lecturer work habits

	<b>B</b>	<b>S.E.</b>	<b>Wald</b>	<b>df</b>	<b>Sig.</b>	<b>Exp(B)</b>	<b>95.0% C.I.for EXP(B)</b>	
							<b>Lower</b>	<b>Upper</b>
LSC1	<b>0.482</b>	0.194	6.211	1	<b>0.013</b>	1.620	1.109	2.368
LSC2	-0.018	0.174	0.011	1	0.916	0.982	0.698	1.382
LSC3	0.124	0.217	0.326	1	0.568	1.132	0.739	1.733

LSC4	<b>0.279</b>	0.165	2.857	1	<b>0.011</b>	1.322	0.956	1.827
LSC5	<b>-0.529</b>	0.191	7.671	1	<b>0.006</b>	0.589	0.405	0.857
LSC6	<b>-0.575</b>	0.220	6.806	1	<b>0.024</b>	0.563	0.365	0.867
LSC7	-0.146	0.254	0.329	1	0.566	0.864	0.526	1.422
LSC8	<b>0.109</b>	0.215	0.257	1	<b>0.019</b>	1.115	0.731	1.701
LSC9	0.100	0.178	0.318	1	0.573	1.106	0.780	1.568
Constant	1.058	0.854	1.538	1	0.215	2.882		

Source: Field data (2016)

The Wald statistics and the significance level in Table 5 show that four out of the nine independent variables namely; “LSC1= Clarity of lecture presentation”, “LSC4= Ability to hold the attention of students during lecture hours”, “LSC5= Encouragement of discussions and question during lecture hours”, “LSC6= Continuous monitoring of progress of learners through assignments and exercises” and “LSC8= Content of curriculum and methods of teaching” were significant in the prediction of academic performance in Ho, Ghana. This is because they had p-values values of less than 0.05 (sig. in Table 4).

This is consistent with findings of Cooper, Lindsay, Nye, & Geathouse (1998) that homework or assignments be a correlate of academic performance. They stated that homework or assignment bore a positive relation with learning outcomes when it is relevant to learning objectives.

Thus the logistic function is given by the equation (2):

$P(\text{Academic Performance})$

$$= \frac{1}{1 + e^{-(1.058 + 0.482LLC1 + 0.279LLC4 - 0.529LLC5 - 0.575LLC6 + 0.109LLC8)}}$$

Also the odd ratio of 1.620 for the significant lecturer specific characteristics *LSC1* (Clarity of lecture presentation) means that, other things remaining the same, students whose lecturer’s presentation in class are clearer were 1.620 times more likely to have higher academic performance as compared with students lecturer’s presentation in class are not clear. Again, the study indicates that, other things being equal, students whose attention is held during lecture hours were 1.322 times more likely to have higher academic performance as compared with those whose attention are divided during lecture hours. This is because, the odd ratio for *LSC4* (Ability to hold the attention of students during lecture hours), was significant at 5 percent. Following from that it was observed from the study that, other things being equal, when students are encouraged by their lecturers to have discussions and questions during lecture hours, then they will be 0.589 times more likely to have high academic performance as compared with when there is no encouragement of discussions and questions during lecture hours. The reason being that the odd ratio of 0.589 for *LSC5* (Encouragement of discussions and question during lecture hours) was found to be significant at 5 percent from the study.

Furthermore, the odd ratio of 0.563 for *LSC6* (Continuous monitoring of progress of learners through assignments and exercises), indicated that students were 0.563 times more likely to have high academic performance when there is a continuous monitoring of progress of learners through assignments and exercises, all other things being equal. Finally, the odd ratio of 1.115 for *LSC8* (Content of curriculum and methods of teaching) indicates that students were

1.115 times more likely to have high academic performance when the content of curriculum and methods of teaching are favourable to students, all other factors being equal.

## CONCLUSIONS AND RECOMMENDATIONS

The objective of this study was to assess the demographic, student specific and lecturer specific characteristics that predict academic performance of tertiary students in Ho, Ghana. A cross-sectional study design was used and the area of study was the Ho Polytechnic in the Volta Region of Ghana. The target population for this study was registered students studying tertiary courses at various stages in Ho Polytechnic. The total number of registered tertiary students as of the time of the study was 4,159, which was made up of 2,676 males and 1,483 females respectively (Planning & Quality Assurance Unit Ho Polytechnic, 2015). In all, a total sample of 350 was drawn from the target population, using proportional representation formula. A binary logit model was used for the estimation of individual student's academic performance.

The descriptive statistics show that 54.6% of respondents were male and 45.4% were females. From the binary logistic estimation, the results show that for the four significant demographic characteristics ( $DC3=1$ ,  $DC6=1$ ,  $DC7=1$ ,  $DC9=1$ ) included in the model, the estimated probability that student will have higher academic performance is 83.45% of the time. In terms of student specific characteristics ( $SSC=1$ ,  $SSC2=1$ ,  $SSC6=1$ ,  $SSC7=1$ ,  $SSC9=1$ ), the estimated probability that student will have higher academic performance is 71.46%. Finally, the binary logistic regression results revealed that for the lecturer specific characteristics ( $LSC=1$ ,  $LSC4=1$ ,  $LSC5=1$ ,  $LSC6=1$ ,  $LSC8=1$ ), the estimated probability that student will have higher academic performance is 69.51%.of the time.

Therefore, identifying factors such a punctuality and regularity of both students and lecturers to class and ensuring that materials that lecturers present to students are very clear and understandable by all students, that lecturers monitor students' progress of learning through constant assignments and quizzes and that students academic affairs understand that the time students spend participating in extra curriculum activities impacts on their grades, should be the best policy option for all stakeholders who are interested in higher academic performance in tertiary schools.

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