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A Comparative Study on the Academic Performance of Students in Bachelor's Degree of Information Technology Having Arts and Science Background in Uganda

Faruque A. Haolader[1*], Walusimbi Hakim[1], Kalinaki Kassim[1] & Hamisi Ramadhan Mubarak[1]

[1] Department of Technical and Vocational Education (TVE), Islamic University of Technology (IUT), a subsidiary organ of the Organisation of Islamic Cooperation (OIC), Dhaka, Bangladesh

[*] Faruque A. Haolader, E-mail: haolader@iut-dhaka.edu

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Abstract

Variations in the academic performance among students at all levels of education are one issue for years now that has attracted the attention of many researchers across the globe. This has prompted researchers and educationists to find out what factors or reasons can be attributed to these variations. Numerous studies have been conducted to determine the various reasons to explain this cause. The purpose of this study therefore, was to compare the academic performance of students in the Bachelor's degree of Information Technology (BIT) having Arts and Science backgrounds in universities of Uganda. In order to achieve the objective of this study, a sample of 202 final year BIT students were purposively selected from two universities in Uganda. These students were categorized on the basis of their A' level backgrounds (130 Arts and 72 Sciences). A descriptive approach employing the Welch's t-test was used to determine the difference between the performance of the two groups and a simple linear regression analysis was used to examine the correlation among students' performance between semesters. The results indicated that there's a significant difference in the academic performance of the two groups, with the science group outperforming arts. However, it was found that there is a more linear increase in the performance of Arts students from semester one through semester five. Furthermore, Arts students performed slightly better than Science counterparts in some course units. Thus the study concludes that Science students perform better than Arts students in the overall semester final examination with Arts students having room for improvement in their performance.

Keywords

academic performance, universities in Uganda, Bachelor of Information Technology, arts & science

1. Introduction

Education is a vital investment for human and economic development for any nation. It is a crucial sector in that, being a major investment in human capital development, it plays a critical role in long-term productivity and growth both at micro and macro levels (Cavalevu, 1979). Education at all levels and in all its forms constitutes a vital tool for addressing virtually all global problems. Education takes place as a learning process conducted in institutions of learning referred to as Schools as well as institutions of higher learning (Universities, Polytechnics and College) (Adeyemi, 2014).

Among other indicators of development of a nation, education has been found to be the basis upon which any nation advances. Hence the ultimate venture that any country can make is to educate its people by equipping them with the right skills, knowledge and attitude to the survival of its society. It is relevant therefore, that institutions of learning at all levels consider the need to integrate into their educational programmes elements that would enhance knowledge, moral conduct, rationality and useful practical skill for living. It is important that these should have some bearing effects on the lives of individuals who seek answers to the various problems of the society.

University education as the top level of formal education in Uganda is facing extraordinary demands to prepare professionals for what is usually referred to as the ‘‘knowledge society’’ (Shen et al., 2007). University education is therefore very important to national economy, both as a significant industry in its own right and as a source of trained and educated personnel for the rest of the economy. To achieve this, a wide range of courses are offered for different fields of life in which students make their choices of study according to their previous academic subjects and performance along with their interests among other factors. These fields include but not limited to, General education, Vocational, Liberal Arts, Law, Engineering and Professional higher Education.

To be enrolled in any university course, a student has to fulfill the entry requirements or standards for the particular university; universities have General Entrance (or “matriculation”) requirements, basic minimum set of qualifications that all students must have for example language requirements. In addition, each course also has its own entry requirements, both in terms of subjects a student must already have studied and attained the examination grades required for entry. If a student has the right subjects, the grades required will vary between universities and also between courses.

That being said, some universities of Uganda offer courses such as the Bachelor’s Degree in Information Technology (BIT) which has flexible entry requirements for subjects of both Arts and Sciences. As a result, two groups of students with different backgrounds (Arts and Science) are admitted into the same course. Difference in the general performance in terms of GPA scores and in particular course units especially those with programming and mathematics concepts have raised concerns as to whether this difference is partially among other reasons caused by the difference in the A’ level backgrounds of the students. The programme has been selected for investigation because of the following reasons:

1) The BIT programme has general entry requirements for students from both Arts and Science

background that include At least two principal passes at the same sitting in Uganda Advanced Certificate of Education (UACE) in any two subjects (Mathematics, Physics, economics, Chemistry, Biology, Geography, Literature, Entrepreneurship, Technical drawing and Fine Art). Subjects for both Arts and Science follow the same grouping and weighting procedure.

2) The course design and the learning materials of both groups are the same. Moreover, the materials are designed and delivered by same group of teaching staff.

3) The course material is quite balanced for both groups, that is, it includes practical and science based course units which give an opportunity to those with science background to perform better. However, it differs from a Computer Science degree, which concentrates much on the scientific aspects of computing. In this course (BIT) students are also expected to study management and information science, and there are reduced requirements for mathematics, which gives a fair ground to those with Arts background to competitively compete.

4) The assessment criteria of both groups are exactly the same. All students are required to participate in the same examination to provide a fair evaluation.

With this rationale, the program becomes an appropriate object for conducting a comparative study of the two groups of students in the research. This study therefore intended to find the comparative performance of students in the BIT degree programme having Arts and Science background from their A' level.

In order to address the above mentioned issues, the following questions were formulated:

1) Is there any difference in academic performance of students in the BIT course having Arts and Science backgrounds?

2) Is there any correlation among students' performance as they progress from one semester to another.

For the above questions to be answered, the study carried out with the following two hypotheses:

Hypothesis 0 (H0):

There is no statistically significant difference in students' performance in BIT with respect to their Arts and Science background from High School (HSC).

Hypothesis 1 (H1):

Students' performance in one semester is positively corelated to the performance in another semester.

2. Related Literature on Factors Affecting Student Performance

Numerous studies have examined the factors that influence academic performance in primary and secondary education as well as at tertiary level, with the purpose of enhancing learning at these stages and reducing drop-out rates. Understanding different parameters which contribute to low or high achievement is a frequent topic.

Personal characteristics have been recognized by a number of studies as one of the factors affecting academic performance. These include sex, age, ability, parenthood, housing expenditures, social background, time spent on studies, time spent on paid work and motivation (Bugge & Wıkan, 2013). In

addition, Nyikahadzoi (n.d.) states that gender is important in explaining academice performance of students. Likewise, Islam (2014) comfirmed gender of the students showed significant independent effect on CGPA. However other results from different studies have showed no significant effect on academic performance with regard to gender (Odeh, 2007; Bugge & Wıkan, 2013; Kyoshaba, 2009). Other studies identified students' attitude/interest in the course as one of the factors which have got a profound effect on the academic achievement (Ali, 2013; Fenollar et al., 2007; Mekonnen, 2014). Kraft and Singhapakdi (1991) as cited by Osaikhiuwu (2014) confirmed that students with strong work ethics (which are influenced by attitude/interest) are strongly committed to their work, more dedicated, focused and tend to perform better than their peers. Furthermore, Thamavithya (n.d.) identified other personal issues influencing academic achievement: (a) Financial difficulties, (b) physical illness, health problems, injury, (c) use of alcohol or other substance abuse, (d) pressure, stress, tension and anxiety, (e) loneliness, lack of emotional control, (f) can't find meaning for anything, no motivation, and (g) conflicts with social obligations/activities.

According to Thamavithya (n.d.) lack of study skills, difficult subjects, too heavy course load, pressure, stress, tension and anxiety have a noteworthy influence on the academic performance. A student's pre-admission achievement according to Islam (2014) and Martha (2009) has a significant determinant effect on his/her educational achievement. The time spent in study, particularly time spent more than 14 hours per week showed significant positive effect on academic performance.

Among other factors identified to influence academic performance include factors related to career issues. However, according Thamavithya (n.d.), career issues such as unsure of major, unsure of minor, no clear career goals or plans, unsure of interests, skills and abilities, do not have a strong impact on the academic performance.

Social related factors have also been recogonised by a number of studies to have notable effects on academic performance (Thamavithya, (n.d.); Umar, Shaib, Aituisi, Yakubu, & Bada, 2010). University life can be stressful, though it is without doubt one of the most memorable experiences in a student's life. It is characterized as a critical developmental period for both late adolescents and young adults. Social factors such as romantic relationships, organizations and clubs (societies) (Umar et al., 2010), social networks, sports activities among others have been found to have effects on students' academic performance. These factors have an effect on academic performance in terms of time demanded and the psychological state they may cause. The problem is how one handles a balance between the stressful academic achievement and social activities. Work commitments, family orientated learning, situation characteristics like a supportive environment, separation from home, family and friends, housing and roommate issues are reported to have an impact on the academic performance (Thamavithya, n.d.).

Institutions are engines for economic growth dedicated to developing skilled workforce (Osaikhiuwu, 2014). The environment present at the institution, academic or non-academic has got a bearing on the academic performance of students. If the institution provides an accomodating and conducive environment, it is most likely to improve the performance of it's students otherwise the performance

will be negatively affected.

Institutional academic factors that have been identified to affect performance inlcude; physical facilities, institutional policy on class attendance, Library facilities, enrollment percentages, availabilty and qualification of institutional academic staff, teaching methods and the evaluation system (Ali, 2013; Haolader, Ali, & Foysol, 2015; Haolader & Nickolaus, 2012). The institutional variables such as unfavourable learning conditions, interrupted water supply, poorly equipped library, overcrowded exam time table, incessant strike and closure of school among other variables do not have any significant impact on students' performance (Osaikhiuwu, 2014). Romer (1993) as cited by Osiakhiuwu (2014), recognized the importance of class attendance in enhancing students' performance. He found that in his economics class, students who attended class regularly made the highest grades. The geographical location of the educational institutions also influence academic performance where by institutions located in Urban areas record students with a higher academic performance than their rural counterparts.

Family factors have also been reported to have a bearing on the academic performance of the students. Some studies have established that Social Economic Status (SES) (Farooq et al., 2011) of the family has got a significant impact on performance. Demographic variables, family member with a degree, household size, own room, own text book and access to internet at home are indirect means of the resources family background offer to the student (Nyikahadzoi, n.d.).

A study was conducted on the factors affecting academic performance of undergraduate students in Uganda. The results indicated that there is a significant relationship between parents' social economic status and academic performance (Martha, 2009). This is the same finding by Farooq et al. (2011) on a study carried out in Pakistan which revealed that Social Economic Status (SES) and parents' education have a significant effect on students' overall academic achievement as well as achievement in the subjects of Mathematics and English. He added that the high and average socio-economic level affects the performance more than the lower level. To their research, parents' education meant more than their occupation in relation to their children's academic performance at school. Parents' level of education as well as the level of involvment in their childrens' (student's) education have been reported to have significant effects on academic performance (Islam, 2014).

Ali (2012) stated that students from monogamous (small size) families perform better than the students from polygamous (large size) families and he pointed out the reasons that are responsible for this:

i) The students in monogamous homes have more time to read their books and study in most cases, because there are fewer people to send on errand. But in polygamous families, the reverse is the case;

ii) The students from polygamous homes have more tendencies to be social deviants due to lack of care and adequate supervision;

iii) Since there are more people in a polygamous family, they exert a lot of pressure or influences that are negative, this will adversely affect the students.

However, other findings present a different view on the issue of family, reporting that it does not have a

significant effect on student's performance as per the findings from research conducted in Bangkok University, Bangkok (Thamavithya, n.d.). In addition, Islam (2014) found out that the economic status of the family measured by home ownership and household possessions showed no significant effects on academic achievement from his research. Bugge and Wıkan (2013) also argued that parent's education seems to be of little importance regarding the students' performance. Parenthood (students with children) does not seem to influence performance significantly.

In addition to the aforementioned factors, high school background/previous academic record (Guàrdia et al., 2006) has also been mentioned to affect academic achievement. The academic achievement in a course is affected significantly by high school specialization, the average mark at high school (Odeh, 2007; Kyoshaba, 2009). Furthermore, Bugge and Wikan (2013) established that there is a correlation between results from upper secondary school and performance at university level. However, according to Mlambo (2011), there is no significant effect of the previous academic record on the education achievement of the students.

Also, a recent study shows a significant relationship between computer ownership and the use of technology which enhances students' academic performance (AbduRahman et al., 2013).

All the above literature reveals that many studies have been conducted on the factors that affect students' academic performance in general. Factors that have been pointed out are generally concerned with the students' personal characteristics, family social-economic backgrounds, institutional issues, career related, social factors as well as high school background (specialization and grade achieved). But the purpose of this study is to investigate whether high school background specifically Arts and Science has a got a bearing on the academic performance of students in the programmeme of Bachelor's degree in Information Technology (BIT) within the higher educational institutions of Uganda. Although some research has been carried out to study the effect of high school background on academic performance (Kyoshaba, 2009; Guàrdia et al., 2006; Bugge & Wikan, 2013; Odeh, 2007), none has been directed towards finding out whether Arts and Science backgrounds specifically affect students' academic performance in a given course.

3. Methodology

In this research, an approach of comparing the academic performance between two groups of students, studying in BIT one having Arts and the other having Science background, has been adopted in order to determine if there's any difference between these two groups.

The pupolation of the study comprised of students (male and female) in the BIT course from two purposively selected Universities in Uganda, namely: Islamic University in Uganda-Kampala Campus (IUIU-KC) and Makerere University (MUK). At the time this study was conducted, the database from the National Council for Higher Education indicated that in Uganda there are 33 licensed public and private universities (6 public and 27 private universities) (Ministry of Education, 2012), most of which offer the BIT course. The criteria for the selection of the universities was; first of all it should be

offering the BIT programmeme, then both Arts and Science students are admitted into this programmeme. This is because some universities like Kyambogo University admit only Science students in this programmeme (Kyambogo University, 2014).

4. Sample Size

The study sample include all final (3rd) year students in the BIT course from two selected universities. As depicted in Table 1, the number of students from arts background is far larger than their science background counterparts. This is attributed to the fact that most students prefer arts to science subjects at A-level due to the difficulty found in taking science subjects. Also, due to the general requirements of the BIT program allowing students from both backgrounds to apply and with the increasing demand of ICT jobs, students from arts background use is as a window of opportunity to enroll for this otherwise science-oreinted program.

Table 1. Summary Details of the Sample Data

Name of the University	Total No. of Students	Arts	Sciences
Islamic University of Uganda	62	52	10
Makerere University	140	78	62
Total	202	130	72
Percent (%)	100	64.36	35.64

5. Data Collection and Analysis Methods

With permission from the respective university authorities, the authors were granted access to copies of students' results for five semesters.

A quantitative approach of comparing the academic performance of students is used to determine the performance of students having Arts and Science backgrounds in the BIT course, the following statistical methods were employed.

Welch's t-test was used to examine whether there's any significant difference in the academic performance between Arts and Sciences students in the BIT course at 0.05 significance level. Welch's t-test is used here because it does not take the assumption of equal variances unlike Student's t-test, and it is more robust than Student's t-test and maintains type I error rates close to normal for unequal variances and for unequal sample sizes (Ruxton, 2006). However, Student's t-tests were also applied for cross checking the results. In addition, Mean score and Standard deviation were determined to measure whether Arts students perform better, the same, or worse than Science students. A simple linear regression analysis was used to determine the correlation between semester final exam results for both groups. All the analysis was done using the Statistical Package for Social Sciences (SPSS v20.0).

6. Research Results

6.1 Analysis of the Null Hypothesis (H0)

H0: There is no statistically significant difference in students' performance in BIT with respect to their Arts and Science background from HSC.

To prove the above hypothesis, both the Student's and Welch's t-test were used so that the difference in the results of the two tests can be identified. Data was tested for normality distribution and all results for the different semesters depicted a close to normal distribution. In addition, the mean scores of the results of the students are used as a measure of whether Arts students performed better, the same, or worse than their Science counterparts.

6.2 Semester-Wise Comparison between Two Groups

Table 2 shows the mean and standard deviation of GPAs obtained by students (Arts and Science separately), and the significance level values of all five semesters. In all semesters, the results indicate that there is a significant difference between the Arts and Science students as the sig. values are less than 0.05 in both the students't-test and the Welch's t-test with only some slight differences between the two tests. Thus, hypothesis *H0*, could not be proved, i.e., there are significant differences between the Arts and Science students. The figures in Table imply that the Science students perform better than their Arts counter parts.

Table 2. Summary Results of the Overall Semester Performance

	Background	Mean	STD. Deviation	Mean Difference	Student's T-Test (SIG.A)	Welch's T-Test (SIG.)
Sem1	Arts	3.3294	.63668	0.3413	0.000264	0.000232
	Sciences	3.6707	.60444			
Sem2	Arts	3.5992	.61487	0.314	0.000293	0.000145
	Sciences	3.9132	.51050			
Sem3	Arts	3.7258	.59215	0.4296	0.000000	0.000000
	Sciences	4.1554	.38960			
Sem4	Arts	3.8824	.51920	0.2658	0.000157	0.000033
	Sciences	4.1482	.36276			
Sem5	Arts	3.9484	.52106	0.2291	0.001389	0.000590
	Sciences	4.1775	.39807			

The mean values of the Arts students range from 3.33 (Sem1) to 3.95 (Sem5), and the Science students range from 3.67 (Sem1) to 4.18 (Sem5). Their ranges are 0.62 (Arts) and 0.51 (Sciences), respectively. These figures illustrate that the overall mean values of Science students (4.01) is higher than the Arts students (3.7). The standard deviations values of Arts students range from .51920 (Sem4) to .63668 (Sem1), and those of the Science students range from .36276 (Sem4) to .60444 (Sem1). Their ranges

are 0.11748 (Arts) and 0.24168 (Sciences), respectively. These figures show that the overall standard deviation value of the Arts students (0.576792) is generally higher than the Science students (0.453074). This suggests that the Science students generally have a stronger central tendency towards the mean value in a particular semester.

7. Comparison of Students' Performance in Selected Course Units

Students' performance data (grade point) from four purposively selected course units was also analyzed to determine the difference in the academic score of students with respect to their Arts or Science backgrounds. The selected course units are as follows:

Table 3. Selected Subject Details

Subject Code	Subject Name
BIT001	Computational Mathematics
BIT002	Structured Programming
BIT003	Database Management Systems
BIT004	Computer Networks and Data communications

Table 4. Summary Results of per Selected Course Unit Performance

Course	Background	N	Mean	STD. Deviation	Mean Difference	Student's T-text (SIG.[A])	Welch's T-Test (SIG.)
BIT001	Arts	130	64.57	9.861	.569	0.678	0.663
	Sciences	72	64.00	8.270			
BIT002	Arts	130	67.87	10.49	.564	0.691	0.666
	Sciences	72	67.31	7.84			
BIT003	Arts	130	66.68	10.33	2.86	0.045	0.033
	Sciences	72	64.00	8.27			
BIT004	Arts	130	68.47	8.97	1.52	0.045	0.033
	Sciences	72	69.99	9.45			

Computational Mathematics (BIT001) introduces students to ideas and techniques from mathematics that are widely used in Information Technology. The course aims to present these ideas "in action". Each topic is geared towards a specific significant application in information technology. The results in the Table above show that there's no significant difference in the performance of students in this course unit as the significance values 0.678 (Student's t-test) and 0.663 (Welch's t-test) are both greater than 0.05 ($P>0.05$), thus null hypothesis is accepted. The mean difference between the two groups is 0.569 with the mean value of Arts students (64.57) slightly higher compared to that of Science students (64.00). The analysis also shows that Science students have a stronger central tendency towards the

mean since their standard deviation value (8.270) is lower than that of the Arts students (9.861).

BIT002 provides students a strong base in the principles and practice of structured programming. A high level programming language is used to explain the principles of programming and provide students with hands on practical skills. The results show that Arts students perform slightly better in this course unit with a mean value 67.87 higher than that of Science students (67.31) and a mean difference of 0.564. Although the results show a slight difference in the mean value, however, this difference is not statistically significant since the significance value 0.69 (Student's t-test) and 0.66 (Welch's t-test) are both greater than 0.05 ($P>0.05$). In addition, the standard deviation value of Arts students (10.49) is also higher than that of the Science students (7.84), which implies that Science students have stronger central tendency towards mean as compared to their Arts counterparts.

BIT003 introduces the basic theoretical and practical concepts of a database to students, its setup, implementation, use and maintenance in a typical business organization. The results show that Arts students perform slightly better in this course unit with a mean value 66.68 higher than that of Science students (64.00) with a mean difference of 2.86. The results indicate that the difference is statistically significant since the significance value is less than 0.05 ($P<0.05$) both in Student's t-test (0.045) and Welch's t-test (0.033), thus the null hypothesis is rejected. The standard deviation value of Arts students (10.33) is also higher than that of the Science students (8.27), which implies that Science students have stronger central tendency towards mean as compared to their Arts counterparts.

BIT004 touches all contemporary business function in many ways. Marketing functions, accounting, administrative, and almost all functions of business depend heavily on data communication infrastructure for transfer of data and information between people, departments, sites, etc., with that in mind this course is designed to provide students with technical knowledge and practical skills to handle data communication and network infrastructure at their future workplace. The results show that Science students perform slightly better in this course unit with a mean value 69.99 higher than that of Arts students (68.47) with a mean difference of 1.52. The results indicate that the difference is statistically significant since the significance values 0.045 (Student's test) and 0.033 (Welch's t-test) are both less than 0.05 ($P<0.05$). The standard deviation value of Arts students (8.97) is also lower than that of the Science students (9.45), which implies that Arts students have stronger central tendency towards mean as compared to their Science colleagues.

7.1 Proof of Hypothesis 1 (H1)

(H1) There is a positive corelation in students' performance as they progress from one semester to another.

7.2 Correlation of Students' Performance in Different Semesters

To determine the correlation, a simple linear regression analysis was performed, this is because linear correlation (Spearman's/Pearson's) does not provide information about the variability between the dependent and independent variables, and cannot be used to predict the value of the dependent variable from the known value of independent variable.

In the Table below, the ANOVA column presents values (Figure and sig.) which are used to tell whether the independent variable has a significant impact on the dependent variable. The coefficients column presents values (Beta (β) and sig.), sig. shows whether the independent variable can be used to predict the value of the dependent variable, and β shows the amount of change in the dependent variable when there's a unit change in the independent variable.

Table 5. Correlation Coefficients for Arts and Science Students from Semester 1-5

Background	Independent Variable	Dependent Variable	Correlation (R)	Adjusted Square	Anova		Coefficients	
					F	SIG.	B	SIG.
Arts	Sem1	Sem2	0.527	.273	49.33	.000	.509	.000
	Sem2	Sem3	.514	.258	45.91	.000	.495	.000
	Sem3	Sem4	.759	.589	185.7	.000	.675	.000
	Sem4	Sem5	.709	.491	125.3	.000	.706	.000
Sciences	Sem1	Sem2	.352	.111	9.87	.002	.297	.002
	Sem2	Sem3	.663	.423	55.02	.000	.506	.000
	Sem3	Sem4	.679	.453	59.9	.000	.632	.000
	Sem4	Sem5	.718	.508	74.4	.000	.788	.000

7.3 Correlation between Semesters One and Two

Using a simple linear regression technique, the model formulated reported a positive and moderate correlation (r = 0.527) with a substantial but small relationship existing between the semester one and semester two performances for Arts students. On the other hand, low correlation (r = 0.352) which indicated a definite but small relationship for Science students. This implies that if a student performs well in first semester, he or she will perform well in second semester. The adjusted r square value of 0.273 (Arts) and 0.111 (Sciences) indicates that 27.3% and 11.1% respectively of the variation in the performance in second semester can be explained by the variation in the semester one results. In the ANOVA Table, the model produced a sig. value of 0.00 (Arts) and 0.002 (Sciences), thus the null hypothesis is rejected as $P<0.05$ in both cases, which implies that student performance in semester one plays a significant role on the performance in the second semester (Table 5).

The coefficients Table reported significance values of 0.000 (Arts) and 0.002 (Sciences) for the independent variable (Sem1). In both cases the null hypothesis is rejected at $P<0.05$ which implies that semester one performance excluding other factors has a significant role in predicting the students' performance in semester two. The results explain that for a unit increase in a grade of semester one results, the GPA of semester two will increase by 0.506 (Arts) and 0.297 (Sciences) holding other factors constant. In the case of residues, the histogram showed an ideal normal distribution for both Arts and Sciences.

7.4 Correlation between Semesters Two and Three

The findings show that there's a positive and moderate correlation of r = 0.514 and r = 0.663, indicating a substantial but small relationship existing between the semester two and semester three performances for Arts and Science students respectively. The results imply that if a student performs well in the second semester, he or she is likely to perform well in the third semester. The adjusted r square values 0.258 (Arts) and 0.423 (Sciences) indicates that 25.8% and 42.3% respectively can explain the variation in the students' performance in third semester.

In the ANOVA Table (Table 5), the model produced a sig. value of 0.000 for both Arts and Science students, thus in both cases, the null hypothesis is rejected (P<0.05). This implies that students' performance in semester two has a significant role on the performance in the third semester. The coefficients Table also reported significance value of 0.000 for the independent variable (Sem2). Thus, the null hypothesis is rejected at P<0.05 which implies that performance in semester two has got a significant role in predicting the students' performance in semester three. In addition, for a unit increase in semester two results, the GPA in semester three will increase by 0.495 (Arts) and 0.506 (Sciences).

7.5 Correlation between Semesters Three and Four

In this model, the results show a positive and high correlation r = 0.759 together with a moderate correlation r = 0.679 for Arts and Sciences respectively between the semester three and semester four performances. The relationship is substantial but small (Arts) and high relationship (Sciences) thus implying that if a student performs well in the third semester, he or she is likely to perform relatively well in the fourth semester. The adjusted R square value is 0.589 (Arts) and 0.453 (Sciences), this indicates that respectively, 58.9% and 45.3% of the variation in the performance in fourth semester can be explained by the variation in the semester three results.

In the ANOVA Table, the model produced a sig. value of 0.000 for both Arts and Sciences, thus the null hypothesis is rejected (P>0.05). This implies that students' performance in semester three has a significant role on the performance in the fourth semester. The coefficients Table also reported a significance value of 0.000 for both Arts and Sciences for the independent variable (Sem3). Thus the null hypothesis is rejected at P<0.05 which implies that the students' performance in semester three has a significant role in predicting students' performance in semester four.

7.6 Correlation between Semesters Four and Five

The model reported a positive and high correlation r = 0.710 (Arts) and r = 0.718 (Sciences) with a high relationship which existing between semester four and semester five performances. This signifies that if the student performs well in the fourth semester, he or she will perform well in the fifth semester. The adjusted r square value of 0.491 (Arts) and 0.508 (Sciences), indicates that 49.1% and 50.8% respectively of the variation in the performance in fifth semester can be explained by the variation in the semester four results.

In the ANOVA Table, the model produced a sig. value of 0.000 for both Arts and Sciences, thus the null hypothesis is rejected (P<0.05), which implies that students' performance in semester four plays a

significant role on the performance in the fifth semester. The coefficients Table (Table 5) reported a significance value 0.000 for both Arts and Sciences for the predictor variable (Sem4). In both cases the null hypothesis is rejected at $P<0.05$ which implies that semester four performance excluding other factors has a significant role in predicting the students' performance in semester five. This means that for a unit increase in a grade of semester one results, the GPA for semester two will increase by 0.706 (Arts) and 0.788 (Sciences) holding other factors constant.

7.7 Discussion on Major Findings

The results from the analysis show that Science students perform better than the Arts students in the overall Semester final exams for all semesters (1–5) with the biggest difference observed in Semester three (0.423), while in the fifth semester the difference is minimal (0.229). This difference in performance could be as a result of Science students paying more attention and being more committed by giving additional time to their studies compared to Arts students. Furthermore, Science students usually bring more math and science related basic knowledge and skills compared to their counterparts that may contribute to their performance at higher level study in BIT course. The findings of this study support this statement too.

The research results also show that Science students have a stronger central tendency towards the mean value in their examination results. In brief, the variance of the Science students is smaller and they have a tighter dispersion in examination results in comparison with the Arts students. On the other hand, the performance of Arts students tend to fall into two extremes.

The results have also indicated that, though there is a significant difference in the overall performance in the semester final exams with Science students outperforming Arts students, results show that Arts students perform slightly better than the Science students in BIT001, BIT002 and BIT003. However, this difference is not statistically significant. Science students performed quite better in BIT004 than the Arts students. Out of the four sampled course units, Arts students performed better than Science students in three and Science student outperformed their Arts colleagues in only one. This implies that perhaps other course units not included in the study sample might have contributed more to the general semester results of Science students that they outperformed the Arts students.

It is also noticed from the analysis that there is a progressive increase in the performance of both groups from semester one through semester five with the Arts exhibiting a more linear progress than the Science students. This implies that depending on the results from the previous semester, students try to improve on their performance in the next semester. The chart in Figure 1 displays this progressive increase in the performance.

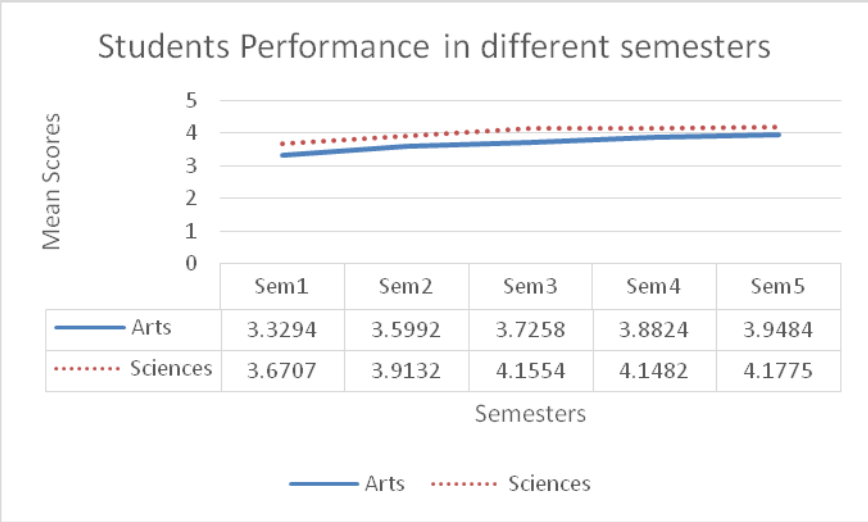

Figure 1. Students Performance in Different Semesters

The correlation of students' performance was positive throughout the five semesters with a moderate and substantial relationship according to the results from Table 5. The Arts students had a stronger overall correlation (0.627) within the semesters compared to Science students (0.603). The results also reveal that variations in the performance in a given semester can be explained by the variations in the results of the semester before it, this is given by the Adjusted R square value in Table 5. Correlation results in a given semester also reveal a significant role on the performance in the next semester, which implies that if a student performs well in a semester, he/she is likely to perform well in the next semester. This is given by the sig. value in the ANOVA column of Table 5. Student performance for the next semester can also be predicted basing on the known performance of the previous semester which is provided by the beta (β) value under the coefficients column of Table 5.

8. Conclusion

Variations in the academic performance among students at all levels of education are one issue that has attracted the attention of many researchers across the globe. Different studies have reported various reasons to explain this cause. Similarly in the same line, this study was conducted to compare the academic performance of students in the BIT course having Arts and Science backgrounds to find out whether there's a significant difference between them such that it can be determined whether this difference can be attributed to their A' level backgrounds. In the study it was found that there is a significant different between Arts and Science students with Science students outperforming their Arts colleagues in the overall semester final examinations. Nevertheless, Arts students slightly perform better than the Science students in some course units of this programme though the difference is not statistically significant. Therefore, according to results from the analysis, the researcher concludes that Science students perform better than Arts students in this course and that the difference is to a certain extent attributed to students' A' level background (Arts/Sciences).

This study is important as it provides institutional administrators, teachers and curriculum developers of the BIT program with empirical evidence that requires putting into considerations the variations in the performance from both backgrounds so as to redesign a curriculum suitable for both groups.

In addition, the results also indicated a positive increase in the performance from semester one through semester five with Arts students exhibiting a more steady and linear progress than Science students. This is evident in the low mean difference between these two groups in semester five compared to semester one. This suggests that Arts students have got the capacity to compete with the Science students.

Regardless of the above variations in the performance from both backgrounds, students end up with the same qualifications hence being absorbed in similar positions in different firms. However, students with outstanding results in all semesters might be preferred by firms that consider specific performances in selected course units depending on the tasks they will be assigned.

Recommendations

The study was limited to only one batch (final year students) in the BIT course from the two universities. However, a deep analysis is required for all batches including students from more other universities in order to generalize the results. In addition, a study on Students' (Arts and Science) views, perceptions and experience in the course is also necessary to find out whether the course content fulfills what they anticipate from this course as this is necessary to supplement the findings of this current study.

This study is primarily designed to generally compare the academic performance of Arts and Science students regardless of any issues. However, research is need to examine the performance of male and female students in this course, and also to compare the performance of students who have morning sessions with those in the evening session of this course.

Basing on the results in this study, the researcher would recommend administrators to increase the admission of Science students in BIT since the results have indicated that they perform better than their Arts counterparts in the BIT programme, especially for IUIU where the number of Science students is extremely low (10) compared to that of Arts students (63).

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