ISSN: 0975-833X

Availableonlineathttp://www.journalcra.com

International Journal of Current Research
Vol. 11, Issue, 06, pp.5047-5055, June, 2019

DOI: https://doi.org/10.24941/ijcr.35713.06.2019

INTERNATIONAL JOURNAL OFCURRENTRESEARCH

RESEARCH ARTICLE

INFLUENCE OF LECTURER CHARACTERISTICS ON ACADEMIC ACHIEVEMENT OF ENGINEERING STUDENTS IN NATIONAL POLYTECHNICS IN KENYA: AN ANALYTICAL STUDY

[1]Khajeha Hariet, [2,*]Enose M W Simatwa and [1]Olive T. Baraza

[1]Department of Educational Management and Foundations, Maseno University, Kenya
[2]Department of Education Policy and Management, Tom Mboya University College, (A Constituent College of Maseno University), Kenya

ARTICLE INFO

Article History:
Received 20th March, 2019
Received in revised form
23rd April, 2019
Accepted 26th May, 2019
Published online 30th June, 2019

Key Words:

Lecturer Characteristics, Academic Achievement, Engineering Students, National Polytechnics Kenya: An Analytical Study.

**Corresponding author: Enose M.W. Simatwa*

ABSTRACT

Engineering covers many different types of activities. Engineers make things, make things work and make things work better. They also use their creativity and innovativeness to provide solutions to the world's problems and help transform the future. Lecturers who teach Engineering courses offered at Diploma level in polytechnics play a critical role in students' acquisition of practical skills and knowledge relating to industrial development worldwide. There is no doubt that the country's economy, national security and everyday lives increasingly depend on scientific and technical innovation. Engineering is a key component of innovation and technological society. Changes on global scene are commonplace challenges and the national leadership is responding quickly by expanding Technical and Vocational Educational Training Institutes (TVET). In fact it is the government policy that every constituency should have a technical training institute. The government has doubled its efforts by extending Higher Education Loan Boards' (HELB) loans to trainees in the technical training institutes. The government is seriously concerned about the declining interest on the part of Kenyan citizens in engineering studies and careers; and the poor performance in national examinations. The trainers who are lecturers, are considered key players in moving forward to improve engineering education. Through engineering education lecturers build competence based workforce for key industries. The performance of students in engineering courses in national polytechnics was unsatisfactory and a serious concern. The unsatisfactory performance could have been due to many factors such as students' attitude, students' entry behaviour, teaching learning resources, infrastructure, lecturer characteristics, location of the polytechnics and the nature of curricula as suggested by the literature review. The objective of this study was therefore to determine the influence of lecturer characteristics on academic achievement of trainees in engineering courses in national polytechnics in Kenya. This study established that lecturers' age and experience significantly influenced academic achievement of engineering students while lecturers' qualification did not statistically influence students academic achievement significantly.

Citation: Khajeha Hariet, Enose M W Simatwa and Olive T. Baraza, **2019.** "Influence of lecturer characteristics on academic achievement of engineering students in national polytechnics in Kenya: an analytical study", *International Journal of Current Research*, 11, (06), 5047-5055.

INTRODUCTION

Studies had shown that students' academic achievement is dependent on certain factors; Hofstein and Lunnetta, (2004) identified school facilities, Michele, (2003) identified the library, Lucke (2012), Ojera, Simatwa and Ayodo (2013) cited the laboratory, Thomas, Henderson and Goldfinch (2013) and Loo and Choy 2013) identified students entry scores, Rockoff (2014) and Kgaile and Morrison (2006) identified teacher characteristics as factors influencing students' performance. This is the literature that informed the choice of the study on influence of lecturer characteristics on academic achievement of students in engineering courses. Olurunfemi and Ashaulu (2006) observed that quality of engineering graduates from Nigerian Polytechnics and Universities had been a major concern for most industries in Nigeria. These complaints stemmed from inadequate skill requirement for most cutting edge technology, low practical knowledge and confidence. According to the duo, the problem of engineering education includes factors such as secondary school foundation, faulty admissions policies, large student enrolment as compared to available infrastructure and the inflexibility of the engineering curricular. Kenya is forging towards becoming a middle levels income economy and eventually a knowledge society by implementing Vision 2030. The government viewed a strong Technical Vocational Entrepreneurship Training capacity as a necessity for achieving the goals of Vision 2030. Technical Vocational Entrepreneurship Training is to provide the

bedrock for transformation of requisite human resources skills for technological and industrial transformation that will lead to increased wealth and social well- being as well as enhancement of the country's international competitiveness. Given this role, high quality training services must be delivered by the Technical Vocational Entrepreneurship Training Sector. National Polytechnics being major stakeholders of Technical Vocational Entrepreneurship Training are expected to train and produce skilled manpower. The objective of Technical Vocational Entrepreneurship Training is to provide and promote lifelong education and training for self-reliance. However, the Technical Vocational Entrepreneurship Training sector is faced with the following problems; inadequate facilities and capacities, the current Technical Vocational Entrepreneurship Training Curriculum was inflexible and not responsive enough to the changing needs of the labor market. Therefore, there was a mismatch between the skills learned in training institutions and skills demand from the industry, moreover, equipment were inadequate, old and out dated; most of training and reference materials and text books were sourced from oversees which made them costly and unaffordable (Ministry of Education, 2005). The rapid increase in enrollment at all levels of education and training without commensurate increase in infrastructure and staff has led to overstretched facilities, overcrowding in learning institutions and high student staff ratios all of which have negatively affected the quality of education. As at the time of the study there were only two national polytechnics in Kenya- The Kisumu and The Eldoret National polytechnics. Performance of engineering students in national examinations has been below average from 2010 to 2014. That is, for this period 2010 to 2014 one of the two National polytechnics presented 645 candidates for Kenya National Examination Council examinations and out of this population, there were 0% distinctions, 6.2% credits, 22.2% passes, 38.3% referrals and 33.3% fail. The majority (71.6%) scored below quality grade. Similarly, the other polytechnic presented a total of 831 candidates for Kenya National Examination Council examinations during the same period and the results were 0% distinctions, 13.2% credits, 34.1% passes, 37.2% referrals and 15.5% fail. It is evident that only 47.3% attained the quality grades. In 2010 for diploma in automotive, one of the two polytechnics registered 22 candidates who performed as follows; distinctions 0%, credits 0%, passes 9%, referred 50% and 41% fail. The other national Polytechnic presented 12 candidates for the same course and realized 0% distinctions, 0% credits, 25% pass, 50% referrals and 25% fail. In 2013, one of the National Polytechnics presented 118 candidates in three courses; mechanical, automotive and electrical. There were only 17 passes, no credits or distinctions, 101 candidates did not pass. From these results, it is clear that students performed dismally yet the polytechnics were well staffed with qualified lecturers.

Research Objective

The research objective was: To establish the influence of lecturer characteristics on academic achievement of students in Engineering courses in National polytechnics in Kenya.

Synthesis of literature on influence of lecturer characteristics on academic achievement of students: The teacher is the most important resource that influences school's academic performance. The traditional psychometric techniques which basically meant using ability, achievement, other paper-and-pencil tests and others to predict teaching effectiveness in terms of student achievement have failed. In the recent past has proved to be casually related to improved student achievement with most studies postulating that the regularly certified teachers tend to produce high student achievement as compared to the non-certified or the emergency certified teachers. Additionally, teacher experience has generally shown to be positively related to student achievement when other variables are statistically controlled. Little research has been published on the unique characteristic of teachers that enable them to make students perform better. Odiembo and Simatwa (2014) in their study found a positive relationship between teacher experience and student's academic achievement in mathematics; they however did not find any significant relationship between teacher age and the student's academic achievement. Studies by Odiembo and Simatwa (2014) revealed that there is a weak relationship between students' achievement and teacher qualification while studies by Goldhaber (2002) and Dial (2008) revealed that teacher qualifications and experience influence positively student's academic achievement, agreeing with Rockoff's (2004) findings. In their study on "Measuring and Targeting Internal Conditions for Schools effectiveness in the Free State of South Africa," Kgaile and Morrison (2006), using a questionnaire as the basis for constructing an index of school effectiveness revealed that teachers were the key drivers of internal school conditions for effectiveness, development and school change. Oshodi (1991) as cited by Akinsolu (2010) who investigated resource utilization and students' academic performance in Kwara State secondary schools using a questionnaire. Using Spearman rank correlation coefficient to determine the most influential factor on students' academic performance found that the quality of teachers was the most important determinant of students' academic performance in secondary schools. From the studies reviewed, there existed a relationship between teacher characteristics and students performances. These studies focused on elementary and secondary schools, and not on lecturer characteristics and academic achievement in engineering courses in polytechnics.

Conceptual Framework

A conceptual framework developed by the researchers was used to hypothesize the influence of lecturer characteristics on students academic achievement in engineering courses in national polytechnics.

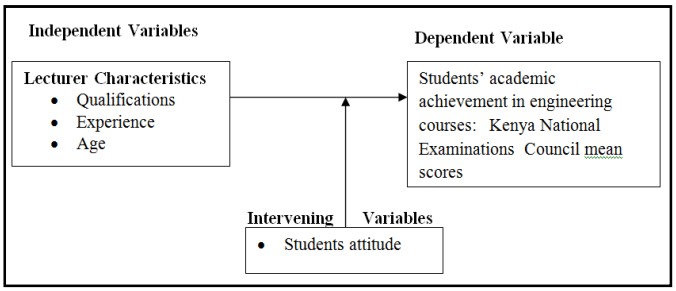

Figure 1. A Conceptual framework showing influence of Lecturer characteristics on Students' Achievement in Engineering Courses in National Polytechnics

The conceptual framework postulates that lecturer characteristics that is, qualification, experience and age have a hypothetical link with the students' academic achievement in engineering courses in national polytechnics. This influence is

moderated by students' attitude. The conceptual framework helps the researchers to focus on the variables of the study so as to establish the influence of lecturer characteristics on students achievement in engineering courses in national polytechnics.

RESEARCH METHODOLOGY

The study adopted descriptive and correlational research designs. Study population was 645 students, 41 lecturers, 2 librarians, 6 technicians and 2 principals. Fisher's formula (Mugenda & Mugenda, 2003) was used to determine sample sizes. Simple random sampling was used to select 241 students and 37 lecturers while 1 principal, 3 technicians and 1 librarian were selected by saturated sampling. Questionnaires, interviews and document analysis guide were used to collect data. Face and content validity was determined by experts in Educational Administration. Reliability was established using test-retest technique whereby Pearson's r coefficient for lecturers' questionnaire was 0.82 at p-value of .05. Quantitative data were analyzed using frequency counts, percentages, means and regression analysis. Qualitative data from interviews and open ended items of questionnaires were transcribed, analyzed and reported in emergent themes and sub themes.

RESULTS

Students Academic Performance: The students' academic performance in Kenya Certificate of Secondary Education examinations results and lecturer characteristics were established as shown in Tables 1 and 2. This was necessary in order to respond to the null hypothesis: lecturer characteristics have no significant influence on students academic achievement in engineering courses. From Table 1, it can be observed that the performance was generally unsatisfactory because majority of the students had very low achievement as signified by the mean grades in Kenya National Examination Council examinations results, where most students failed. Table 2 indicates that 60% of the lecturers had bachelor's degree in technical area, 31% were diploma holders, 7% had higher national diploma while 2% had a master's degree. Regarding their ages 43% were aged 41-48, 33% were between 33and 40, 17% ranged between 49 and 56 while 3 (7%) were between 57 and 60. It is also indicated that 10 (24%) of the lecturers had taught for 16-20 years, 10% for 21-25years,9 (21%) for 6-10 years, 5 (12%) for 26-30 years, 3 had taught for 1-5 years, 3 for 11-15 years while 2 (5%) had 31-35 years of experience. From this distribution it is clear that the polytechnic has qualified lecturers with the necessary professional qualifications and experience and yet the

Table 1. Cumulative Academic Performance of Students in Engineering courses 2010 to 2014

Kenya National Examination Council mean scores in engineering Diploma examinations	Frequency	Percentage
Distinction 1 (1 point)	0	0
Distinction 2 (2 points)	0	0
Credit 3 (3 points)	12	1.4
Credit 4 (4 points)	28	3.4
Pass 5 (5 points)	53	6.3
Pass 6 (6 points)	90	10.8
Referral 7 (7 points)	183	22.1
Fail 8 (8 points)	462	56.0
Total	828	100

Table 2. Lecturer Characteristics

Lecturer Characteristics		Frequency	Percentage
Professional qualifications	Diploma	13	31
	Higher national dip	3	7
	Bachelors in tech. Education	25	60
	Masters	1	2
	Total	42	100
Age	33-40	14	33
	41-48	18	43
	49-56	7	17
	57-60	3	7
	Total	42	100
Experience	1-5	3	7
	6-10	9	21
	11-16	3	7
	16-20	10	24
	21-25	10	24
	26-30	5	12
	31-35	2	5
	Total	42	100

Table 3. Model Summary on Influence of Lecturer Characteristics on Students' Academic Achievement in Engineering Courses

Model	R	R square	Adjusted R square	Std. Error of the Estimate	R Square Change	Change Statistics			Sig. F Change
						F Change	df1	df2	
1	.255	.065	.055	.03152	.065	6.526	1	40	.012
2	.190	.036	.026	.03200	.036	3.692	1	40	.064
3	.336	.113	.104	.03069	.113	11.988	1	40	.001

Model 1=Age Model 2 =Qualification Model 3= Experience
Predictor: (Constant), Lecturer Characteristics

performance does not reflect this, to establish the influence of lecturer characteristics, regression analysis was computed. To establish the influence of lecturer characteristics, regression analysis was computed. The results were as shown in Table 3. Table 3 indicates that lecturers age had a significant influence on students' performance (r=.255, N=42, P<.05) and accounted for 5.5% of variation in students' academic achievement as signified by the adjusted R square .055 therefore, the null hypothesis that "lecturers age has no significant influence on students' achievement in engineering courses in national polytechnics" was rejected. Table 3 further shows that lecturers' qualification had no significant influence on students' performance (r=.190, N=42, P>.05) therefore, the null hypothesis that "lecturer qualification had no significant influence on students' achievement in engineering courses in national polytechnics" was accepted. The result in Table 3 indicates that lecturers experience had a significance influence on academic achievement of students (r=.336, N=42, P<.05) and accounted for 10.4% of the variation in students' achievement as signified by adjusted R Square .104 therefore, the null hypothesis that "lecturer experience has no significant influence on students' achievement in engineering courses in the national polytechnic" was rejected.

From Table 4, it can be observed that lecturers age was a significant predictor of students' academic achievement (F (1, 40) =6.526, P<.05) From Table 5, it can be seen that an increase of one unit in lecturers age increased students' academic achievement by.002 units. This can be expressed by the regression equation $Y=.110+.002X_1$. Table 6 indicates that lecturers experience was a significant predictor of students' academic achievement in engineering courses (F (1, 40) = 11.988, p<.05). Regression analysis was performed to establish the actual prediction and influence of lecturers age and experience. The result was as shown in Table 7 and 8 respectively. From Table 7, it can be noted that an increase of one unit in lecturers experience will increase students academic achievement by .001 units. Regression equation $Y=.153+.001X_1$ The samples of students who learned without any form of interruption were selected for the specific courses in engineering in order to fully interrogate the influence of lecturer characteristic on their academic achievement. The results were as shown in Tables 8 to 14. To achieve this data on lecturer characteristics in specific engineering courses was established and regression analysis computed with the data on students' performance in engineering courses at the polytechnic.

Table 4. ANOVA for the influence of Lecturers Age on Academic Achievement of Students In Engineering Courses

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.006	1	.006	6.526	.012
	Residual	.093	40	.001		
	Total	.100	41			

Dependent Variable: Students academic achievement in Engineering courses
Predictor: (Constant), Lecturer's Age

Table 5. Regression analysis for the influence of Lecturers Age on Students' Academic Achievement in Engineering courses

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
1		B	Std. Error	Beta		
	(Constant)	.110	.026		4.207	.000
	Age	.002	.001	.255	2.555	.012

Dependent Variable: Students academic achievement in engineering courses
Regression Equation:$Y = \beta_0 + \beta_1 X_1 +$ ----------ε

Table 6. ANOVA for the influence of Lecturers' Experience on Students' Academic Achievement in Engineering Courses

Model		Sum of squares	df	Mean square	F	Sig.
	Regression	.011	1	.011	11.988	.001
	Residual	.089	40	.001		
	Total	.100	41			

Dependent Variable: Students academic achievement in engineering courses
Predictor: (Constant), Lecturer's Experience

Table 7. Regression Analysis for the Influence of Lecturers Experience on Students Academic Achievement in Engineering Courses

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.153	.007		21.464	.000
	Experience	.001	.000	.336	3.462	.001

Dependent Variable: Students academic achievement in engineering courses
Regression Equation:$Y = \beta_0 + \beta_1 X_1 +$ ----------ε

Table 8. Model Summary on Influence of Lecturer's Characteristics on Academic Achievement of students in Electrical and Electronics Engineering

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.260	.068	.039	.02954	.068	2.325	1	34	.137
2	.182	.033	.003	.03008	.033	1.091	1	34	.304
3	.374	.140	.113	.02837	.140	5.191	1	34	.030

Model 1=Age Model 2 =Qualification Model 3= Experience Predictor: (Constant), Lecturer Characteristics

Table 9. ANOVA for the Influence of Lecturers Experience on Students' Academic Achievement in Electrical and Electronics Engineering

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.004	1	.004	5.191	.030[b]
	Residual	.026	32	.001		
	Total	.030	33			

Dependent Variable: Students academic achievement in Electrical and Electronics Engineering
Predictor: (Constant), Lecturer's Experience

Table 10. Regression Analysis for the Influence of Lecturers Experience on Academic Achievement in Electrical and Electronics Engineering

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	.144	.011		12.675	.000	.121	.167
	Experience	.002	.001	.374	2.278	.030	.000	.003

Dependent Variable: Students academic achievement in Electrical and Electronics Engineering
Regression Equation: $Y = \beta_0 + \beta_1 X_1 +$ ----------ε

Table 11. Influence of Lecturer Characteristics on Students' Academic Achievement in Automotive Engineering

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.316	.100	.057	.03579	.100	2.331	1	21	.142
2	.256	.066	.021	.03646	.066	1.473	1	21	.288
3	.388	.147	.106	.03484	.147	3.612	1	21	,071

Model 1= Age, Model 2=Qualification, Model 3= Experience. Predictor: (Constant), Lecturer Characteristics

Table 12. ANOVA of Influence of Lecturer Characteristics on Students' Academic Achievement in Automotive Engineering

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.005	3	.002	1.198	.337[b]
	Residual	.025	19	.001		
	Total	.030	22			

a. Dependent Variable: Students academic achievement in Automotive Engineering
b. Predictors: (Constant), Lecturers Experience, Qualification, and Age

The specific engineering courses were automotive engineering, electrical and electronics engineering and mechanical engineering.

Influence of Lecturer Characteristics on Students' Academic Achievement in Electrical and Electronics Engineering: From Table 8, it can be noted that lecturers age has no statistically significant influence on students 'academic achievement p>.05 therefore the null hypothesis that "lecturers' age has no statistically significant influence on students' academic achievement in engineering courses was accepted. Table 8 further shows that lecturer qualification has no statistically significant influence on students' academic achievement in engineering courses p.>.05 therefore the null hypothesis that lecturers' age has no statistically significant influence on students' academic achievement in engineering courses was accepted. Table 9 indicates that lecturers experience was a significant predictor of students' academic achievement in Electrical and Electronics engineering. (F (1, 32) =5.191, P<.05). Regression analysis was performed to determine the actual prediction and influence; the result was shown in Table 10. From Table 10, it can be observed that an increase of one unit in lecturers' experience will increase students' academic achievement in automotive engineering by .002 units, this can be expressed by Regression Equation**:** Kenya National Examination Council mean scores in engineering Diploma examinations =.144+.002X_1. Influence of lecturer characteristics on students' academic achievement in Automotive Engineering. Regression analysis was performed to establish the influence of lecturers' characteristics on students' academic achievement, the result was as shown in Table 11. From Table 11, it can noted that lecturers age had no statistical significant influence on students' academic achievement as the p- value was .142; Lecturers qualification has no statistically significant influence on students' academic achievement as the p- value was p.288, and; lecturers experience has no statistically significant influence on students' academic achievement as the p- value was .071. Therefore, the null hypothesis that "lecturers' characteristics has no statistically significant influence on students' academic achievement in automotive engineering" was accepted. To confirm as to whether lecturer characteristics were significant predictors of students academic achievement in automotive engineering ANOVA was computed and the results were as shown in Table 12. From Table 12 it can be observed that lecturer characteristics were confirmed that they were not significant predictors of students academic achievement in automotive engineering (F (3,19) =1.198, P>.05)

Influence of Lecturer Characteristics on Students' Academic Achievement in Mechanical Engineering: Lecturers' characteristics were correlated with students' academic achievement in mechanical engineering; the results were as shown in Table 13. From Table 13 it can be noted that lecturers age, qualification and experience had no statistically significant influence on students' academic achievement in mechanical engineering courses as the p-values were .236, .478 and .114) respectively. Therefore, the null hypothesis that "lecturer characteristics has no statistically significant influence on students' academic achievement in mechanical

Table 13. Influence of Lecturer Characteristics on Students' Academic Achievement in Mechanical Engineering

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.194[a]	.038	.012	.03073	.038	1.453	1	37	.236
2	.1.014	.014	-.013	.03111	.014	.513	1	37	.478
3	.257	.066	.041	.3027	.066	2.6271	1	37	.114

Predictor: (Constant), Lecturer Characteristics

Table 14. ANOVA of Influence of Lecturer Characteristics on Students' Academic Achievement in Mechanical Engineering

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.005	3	.002	1.740	.177[b]
	Residual	.032	35	.001		
	Total	.036	38			

a)Dependent Variable: Students academic achievement in Mechanical Engineering
b)Predictors: (Constant), Experience, Qualification, Age

engineering" was accepted. This means that lecturer characteristics did not influence students' academic achievement in mechanical engineering. To confirm as to whether lecturer characteristics were significant predictors of students academic achievement in mechanical engineering ANOVA was computed and the results were as shown in Table 14. From Table 14 it can be observed that lecturer characteristics were confirmed that they were not significantly predictors of students academic achievement in mechanical engineering.

DISCUSSION

Lecturers or trainers are charged with the responsibility of implementing the competence based curriculum in Technical and Vocational Educational Training Institutes. Their ability to impart knowledge and enhance skills depends mainly on three factors; age, experience and qualification. The findings of this study indicated that these demographic factors had little influence on academic achievement of students in engineering courses in National polytechnics. However, these were not unique findings. The findings that lecturer characteristics have low influence students' academic achievement agrees with Rivkins, et.al (2005) who concluded that there is no evidence that having a master's degree improves teacher skills. That, it appears important gains in teaching and quality occurs in the first year of experience and smaller gains over the next years. This finding however differs with Michael and Williams (2013) findings that instructor characteristics of gender and academic rank affected science engineering technology and average student course grades.

They established a statistically significant negative correlation between experience and Science Engineering and Technology. These findings are in agreement with the findings by Odiembo and Simatwa (2014) who found positive moderate relationship between teachers' experience and students' academic achievement in mathematics, a negative moderate relationship between teachers' qualifications and no relationship between teachers' age and students' academic achievement in mathematics in Muhoroni Kenya. Possessing a higher degree does not necessarily determine the lecturers output (Kimani, Kara & Njagi, 2013; Odiembo & Simatwa, 2014). This is because the syllabus or the curriculum the lecturer is supposed to teach does not change it remains the same thus the higher qualification only helps the individual lecturer to rise in position academically.

The lecturer may have the academic qualifications yet wanting in classroom delivery skills or the kind of examination students are given may be wanting in terms of syllabus coverage or level of difficulty. This however, should not be the case for lecturers at the Technical and Vocational Educational Training Institutes who are actively trainers. Lecturers can only deliver when they have the necessary facilities in terms of text books and instructional materials which as earlier explained were inadequate and shared amongst students. The principal in an interview in one of the institution reported that the institution had 11 Teachers Service Commission appointed lecturers for automotive, 19 for electrical and 12 for mechanical. She further said that the institution had a shortage of 90 teaching staffs. This meant that the lecturers were overloaded thus hampering time for preparation and giving individual attention to students. This was supported by the responses of the lecturers who were required to give the number of hours for teaching per week, some had up to 36 hours in a week against the 18 hours as stipulated by the policy, the lecturers further were required to give the number of students in their classes some had 140 especially in electrical and mechanical engineering. In such a case the teacher only works to complete the syllabus not delivery of the content.

The lecturer finds it difficult to give regular tests mark and revise in time. This requires the learner to be self-motivated which is lacking greatly in most students especially given the kind of teaching in high school where the teacher is everything to the learner. Lecturers' experience had a statistical significant influence on students' academic achievement in Electrical and Electronics engineering as the p- value was less than .05. This finding concurs with that of Michael and William (2013) who found a positive relationship between teacher certification and student achievement." From interview and document analysis it was established that electrical and electronics department had 19 lecturers. 7 had diploma, 1 higher national diploma and 11 had bachelors in technical education. The lecturers in the department were experienced only 2 lecturer had one-year experience. Experience makes the lecturers familiar with the practical models and not necessarily the theory lessons which are emphasized by the syllabus. On the other hand, lecturers who have taught for long may overlook preparation on the notion that they know what to do and therefore fail to update their class notes making students to miss on the emerging issues which sometimes are emphasized in the examination. The presence of lecturers in an institution does not necessarily guarantee performance.

From an interview with the principal of one of the polytechnics it was established that Automotive had only 11 lecturers who handled students in the department. This implies that the lectures were overloaded and therefore could not perform well. Overloading of lecturers does not give them time for preparation and giving maximum attention to individual students, it also limits the number of assignments a lecturer can give to students, mark and revise which all have a negative influence on students' performance. Students who enroll for Automotive engineering come with different expectations; to learn skills in handling automobiles which is actually contrary to academics therefore may have a negative attitude towards theory which is emphasized by the Kenya National examination council examinations. Lecturer characteristics do not influence students' academic achievement in mechanical engineering. This finding agrees with the findings of Kane, Rockoff and Staiger (2006) who found that teacher certification and experience do not influence academic achievement in engineering courses. This can be as a result of the shortage of lecturers as was observed by the principal in an interview. The lecturers were overloaded thus they had limited time for preparation and interaction with students. In some cases they were not able to effectively administer continuous assessment tests, mark and revise in time with students. The lecturers could be only concerned with completing the syllabus not necessarily paying attention to specific areas.

Conclusion

The trend in students' achievement over the years has not changed. This implies that there is a status quo in engineering education. The lecturers seem not to be taking advantage of their age, qualification and experience to promote engineering education. There are many reasons for this outcome. These could include but not limited to low remuneration, inadequate teaching learning resources, low entry behaviour of students, teaching approaches and leadership styles adopted by principals of Technical and Vocational Educational Training Institutes institutions.

Recommendations

The Ministry of Education, state department of technical and vocational education should review entry behaviour upward so that only potential trainees with good grades are admitted. Technical and Vocational Educational Training Institutes should provide academic guidance, counseling and career services to trainees to demystify the commonly held view that engineering courses are hard to pass in national examinations. Technical and Vocational Educational Training Institutes should develop and mount INSET programs to enable lecturers build their capacities in service delivery. Technical and Vocational Educational Training Institutes' lecturers should give proper orientation to students in their first year and help them to establish early identity as engineers through exposure to engineering coursework, early research experiences, experiential learning and the context of engineering. Lecturers should address poor instruction and advise that is cited by many of the students who drop out of engineering. Lecturers should provide opportunities to work for the public good, to take advantage of student interest in public service. Lecturers should develop effective learning approaches to engineering and science education as well as practical exposure to broadening engineering education through institutions – university – industry partnerships. Lecturers should review the curriculum to include not just knowledge but also skills and attitudes. They should focus on understanding what it means to be a lifelong engineer learner and acquiring the related skills. Lecturers should introduce history of engineering into the engineering curriculum. The works of great engineers should be taught with reference to philosophies of such engineers. For instance Julius K. Nyerere's Philosophy "Education for self – reliance."

REFERENCES

Adayemi, B. 2010. Teacher related factors as correlates of pupil achievement in social studies in Southern- Western Nigeria. *Electronic Journal Research in Educational Psychology.* Vol. 8 (1): 313-332.

Adewale P. O. & Adhuze, B. O. 2013. Entry Qualification and Academic Performance of Architecture Students in Nigerian polytechnics. Are the admission requirements still relevant? *Frontiers of architectural research Vol. 3 issue 1March 2014 pp. 69-75.*

Akinsolu, A.O. 2010. Teachers and students' Academic Performance in Nigerian Secondary Schools: Implications for planning. *Florida journal of* Educational *Administration and Policy.* Vol. 3 (2).

Althea, R., & Erick. B. 2015. Understanding practical engagement; perspectives of undergraduate civil engineering students who engage actively in practical. *Caribbean Teaching Scholar* Vol. 5 No.1 April 2015.

Awuory, C. 1994. A study quality education in private schools in Siaya and Kisumu Districts. Unpublished M. Phil Thesis, Moi University.

Best, J.W. 1977. Introduction to Educational Research; London, Oxford University press.

Bryce, E., Juan, C., Hurtado, S., & Eagan, K. 2013. *Examining the Tracks that Cause Derailment; Institutional Context and Engineering Degree Attainments*. A paper presented at the American Research Association Annual Forum May 2013.

Calvo, R., Markauskaite, L., & Trigwell, K. 2007. Factors affecting students' experiences and satisfaction about teaching quality in engineering.

Christopher, J. 2004. Teacher characteristic and students' achievement: evidence from Teachersurvey, *Journal of Economics* 2005 (57): 302-319.

Chunghwa, W.B. 2000. Technology education and world development: challenge Opportunity for education in Africa. *The Journal of Education Administration.* Vol. 5(1): 439-460.

Cole, D., & Espinoza, A. 2008. Examining Academic success of Latino Students in STEM Majors. Online www.redorbit.com retrieved 2/16/15 17; 50hrs.

Creswell, J. W. 2014. *Research Design, Qualitative, Quantitative and Mixed Methods.* Singapore. SAGE.

Dan, G. 2002. *The Mystery of Good Teaching*: Vol. 1 (1).

De Jager, K. 2002. Successful students; does the library make a difference in the Performance measurements and merits. *Journal of Educating Administration.* 3(1): 140-144.

Dial J. C. 2008. The effect of Teacher experience and teacher degree levels on student achievement in Mathematics and communication Arts. Doctor of Education Degree in Education leadership. Baker University U.S.A

Fraenkel, R., & Wallen, N. 2003. *How to design and evaluate research in education*. McGraw-Hill, USA.

Gall, M.D., Borg,W. & Gall, P. 2007. *Educational Research-An Introduction*. Longman, USA.

Gichira, R. 2002. *Ensuring relevance and quality in TIVET education.* Nairobi.

Goldhaber, D. 2002. The Mystery of Good Teaching. Education next. Retrieved from <www.hoover.org/ publications/ednext/3368021.html>

Guga, A. 1998. *The teacher, teacher education and National development*. Paper at the Conference facing challenges in development in Nigeria in the 21st Century Organized by the school of Arts and Social Sciences. Federal College of Education, Kistna.

Gunderson, M. 2004. *A Study on the Influence Vocational Education has on Students Ultimate Academic Success*. Online http//www...Mwlun DgCbw retrieved on 2/16/15.

Haddad. 1978. *Educational effects of class size* Washington DC, World Bank staff Working Paper No. 280.

Hallack, P., & Poisson, M. 2007. Corrupt schools, corrupt universities, what can be done.

Hofstein, A., & Lunetta, V. 2004. The laboratory in science education. Formulation for the 21st Century*, scientific report Journal.* Vol. 45, (4): 23-34.

Jack, K., & Peter, J. 2012. Effect of class size on engineering student performance at Bingham University. Available on www.classsizematters.org 29th May, 2015 13.30hrs.

Jamison, D. 1982. *Reduce class size and other alternatives for improving school. An Economist view class (Eds) school size and other alternatives for improving schools.* California, Beverly Hills.

Kamila, S., & Daudi, M. 2012. Assessing students' practical skills in basic electronic laboratory psychomotor domain model. *Social behavioral sciences 56 (2012)* 546-555.

Kane, T.J., Rockoff, J., & Staiger, D. 2006. *What does certification tell us about teacher Effectiveness Evidence from New York City.* Working Paper No. 12155. Washington D.C: National Bureau of Economic Research.

Kgaile, A. & Morrison, K. 2006. Measuring and Targeting Internal Conditions for school Effectiveness in the Free State of South Africa.

Kimani, G.N., Kara, A.M. Njagi, L. W. 2013. Teacher Factors influencing students Academic Achievement in secondary schools in Nyandarua County, Kenya. *International Journal of Education and Research.* Vol. 1. (3): 1-14.

Lassa, P. 2000. *Teacher Production-; a focus on Nigeria. The state of education in Nigeria*. (70-83).UNESCO, Abuja.

Lockheed, K. 1989. Teaching quality and student achievement in Africa: The case of Nigeria and Swaziland. *Teaching and Teacher Education.*5:93-113.

Loo, C.W., & Choy, J.L.F. 2013. Sources of self-efficacy influencing academic performance of engineering students. *American journal of education research vol1. No3 86-92.*

Lucke, T. 2012. Using hands –on to engage students in engineering mechanics. *Paper presented at the 40thannual conference 23-26thSeptember 2012.*

Mckenzie, K. 2001.Who succeeds at the university? Factors predicting academic performance in first year Australian university students. *Higher education research and development, 20: 21-33*

Michael, D.A., & William, J. S. 2013. Effects of course and instructor characteristics on student evaluation of teaching across a college of engineering. *Research journal for engineering education Vol. 102: 289-318 April 2013.*

Michele, L. 2003. *Impact of school libraries on student Achievement: Review of research.* Camber well: Australian council for Education research..

Ministry of Education. 2006. *Technical Education Programs*. Syllabi regulation Kenya Institute of Education, Kenya.

Ministry of Education. 2012. *Taskforce on the realignment of the education sector to the Constitution of Kenya.* Nairobi: Government printer.

Muganda, A. 2008. Relationship between school performances in primary schools in Butula Division, Unpublished Masters' Proposal, Maseno University.

Mugenda, O.M. & Mugenda, A.G. 2003. *Research Methods. Quantitative and Qualitative approaches.* Nairobi: Acts press.

Mwangi, D. 1983. Factors influencing the performance and learning of mathematics among Secondary schools in Kenya. Unpublished MA thesis, University of Nairobi.

Ngau, M. 1991. Grade Retention and school Dropout in Kenya primary schools; a critical. Analysis access equity issues in education, Los Angeles; Unpublished PHD thesis. University of California at Los Angeles.

Odiembo, J.A.E. & Simatwa E.M.W. 2014. The Relationship between Secondary School Mathematics teacher age, gender and students academic achievement in mathematics in Kenya. A case study of Muhoroni Sub County. *Journal of* Educational *Research* Vol. 5(7): 225-240.

Odiembo, J.A.E. 2013. Relationship between selected secondary school teacher characteristics and students' academic achievement in mathematics in Muhoroni District . Kenya. An unpublished thesis Maseno University.

Ojera, D.A., Simatwa, E.M.W., & Ayodo, T.M.O. 2013. Perception of Staff and Students on Factors that Influence Performance in Science Laboratory Technology in Institutes of Technology in Southern Nyanza Region, Kenya. *International Journal of Academic Research In Business and Social Science Nov 2013 Vol. 3 No11.*

Olasunmbo, A.S. 2013. Entry Qualification and Performance of Engineering Students in Nigerian polytechnics. Are the admission requirements still relevant? *Frontiers of architectural research Vol. 3 issue 1March 2014 pp. 69-75.*

Olurunfeni, A., & Ashaulu, M. 2006. A pragmatic approach in engineering education, Teaching Methods and industry partnership, Nigeria.

Republic of Kenya. (July-2005) *Kenya education sector support program 2005-2010.* Nairobi. Government printer.

Republic of Kenya. 1998. Ministry of education and human resource development results of 1995 primary census. Nairobi: Government printer.

Republic of Kenya. 2005. *Kenya educational sector support program 2005-2010: Delivering Quality education and training to all Kenyans*. Nairobi: Government printer.

Rivkins, S.G., Hannushek, E.A., & Kain, J.F. (2005).Teacher Schools and Academic Achievement. Online Available http:/www.utdallas.edu/research Publications.htm.April 10 2014.

Rockoff, J. 2004. The Impact of individual teachers on student achievement. Evidence from panel data. *American Economic Review Journal* Vol. 94(2):247-252.

Romanas, V.K., & Jonas, K. 2007. Laboratory instruction in engineering education. *Global journal of engineering education Vol 11.No 2*

Russel, C.J. 2010. Engineering capacity building in developing countries. Available www.worldexpertise.com May 23rd 2015 11.30hrs.

Stephen, P.H., Joseph, P. & Manuel, A. S. 1978. Text books and achievement: What we know. World Bank staff working paper No. 298.Available www.vanderbilt.edu.April 3 2014 1400hrs.

Thomas, G., Henderson, A. & Goldfinch, T. L. 2013. Influence of University Entry Scores on Students Performance in Engineering Mechanics. *Australasian Journal of Engineering Education Vol. 17 No.1*

UNESCO & ILO 2002. *Technical and Vocational Education and training 21st CenturyParis.*

UNESCO. 1996. *Financing technical and vocational education, modalities and Experience.*

UNESCO. 2004. *Developing technical and vocational education in sub-Saharan Africa.*

Voss, R. 2006. The desired qualities of Lecturers in higher education: A means end analysis. University of Education Ludwigsburg, Ludwigsburg Germany

Williams, J., Lloyd, M., &Spengler, J. 2005.The case for sustainable laboratories. First Steps at Harvard University. *International journal on sustainability in higher education 6 (4): 363-383.*

World Bank. 2000. Higher education in developing countries. Task force on Higher education and society. *World Bank 1818H Washington DC Feb 2000.*

Yala, P.O., & Wanjohi, W.C. 2011. Performance Determinants of KCSE Mathematics in secondary schools in Nyamira Division, Kenya *Asian Social Science,* 7(20): 107-120.

****