LINKING UNIVERSITY RESEARCH STRATEGY AND INDUSTRY NEEDS: COMPARATIVE PERFORMANCE ANALYSIS OF PUBLIC AND PRIVATE UNIVERSITIES IN KENYA

Dr. Orucho M. Ngala
School of Business and Economics, Co-operative University of Kenya, Kenya

International Academic Journal of Social Sciences and Education (IAJSSE) | ISSN 2518-2412

Received: 5th May 2020

Published: 19th May 2020

Full Length Research

Available Online at: http://www.iajournals.org/articles/iajsse_v2_i2_98_109.pdf

Citation: Orucho, M. N. (2020). Linking university research strategy and industry needs: Comparative performance analysis of public and private universities in Kenya. *International Academic Journal of Social Sciences and Education, 2*(2), 98-109

ABSTRACT

The need for sharing knowledge between universities and industry has become increasingly evident in recent years. Historically, research institutions have been a source of new ideas and innovations and industry has been a natural route for optimising the use of such ideas. Never the less, the past decade has experienced a significant dynamism in the roles of both parties. This study sought to contribute to knowledge by assessing the extent to which linking university research activities to the needs of the industry would influence performance of universities in Kenya. The main anchoring theory for this study is resource based view. Cross-Sectional survey research design was used in the study. The population of the study consists of sixty five (65) public and private universities incorporated in Kenya. Out of this, a sample of forty seven (47) universities which had undergone at least one graduation cycle was taken. Primary and secondary data was collected using semi-structured questionnaires and review of existing university documents and regulatory bodies websites respectively. The reliability test was carried out on the questionnaire was and was found fit. Correlation analysis was undertaken to determine correlations between variables. In order to undertake comparative analysis between private and public universities, independent sample t-test, standard deviation, arithmetic mean and coefficient of variation (CV) were used. Out of the targeted forty seven (47) respondents from forty seven (47) universities, a total of forty four (44) questionnaires were returned, representing 94% response rate. It was established that positive and significant correlations existed between collaborative research and university performance. The findings have valuable contributions to policy formulation, body of theory and practice. The significance of firm resources as collaborative components in University research cannot be overlooked. The findings offer insights to university authorities and policy makers by answering the question on the role of collaborative strategies when conducting research. The key recommendation that the study offers to researchers is the need to enhance collaboration with the industry in order to substantially exploit the synergies resulting from enhanced symbiotic correlations between university and the industry. The major limitation that was faced during this study is that collection of primary data was only from one respondent in each university. However, common methods bias was mitigated by the use of secondary data for validation of primary data. Thus, the limitation did not affect the credence of the results as presented and discussed. Secondly, although it was not possible to include all the determinants of institutional performance, balanced score card was appropriately used to represent financial and non-financial aspects that constitute performance indicators.

Key Words: *collaboration, research, strategy, industry, performance, university*

INTRODUCTION

In global world today, generating new knowledge and converting it into new services and products which are useful in meeting the needs of the industry is crucial to maintain and enhance University competitiveness. In this context, the term industry has been used as a constituent of all the stakeholders who exert influence and with interest in the university research output. It refers to the larger economic sector including business community, agricultural and public sectors. Many Studies on linkages between university education and industry sector have demonstrated that having a strong mutual relationship between the two would enhance synergies for exploitation. This implies that performance of universities should be measured in terms of quality of linkages it has with industry sector Table 1.3 shows that Private Universities. According to report by European Commission (2007), the need for effective knowledge transfer among public and private research institutions has never been greater than it is today. Universities and other research institutions should understand that leadership in their respective fields depends upon collaborating productively with each other, in ways that support and reinforce their distinct yet complementary missions. The industry continually demands for relevant and competitive research findings which should be regularly disseminated by researchers (Ginies and Mazurelle, 2010). As poised by Eshiwani (1999), a university may only remain relevant on condition that it responds promptly to the dynamic technology and emerging industry demands, by formulating proper linkage strategies. The industry cannot afford to operate in isolation and must foster linkages with universities. Universities on the other hand, cannot ignore the industry which is the consumer products and services generated from university research. Ogawa (2002) studied 95 public and 597 private universities in Japan and noted that Japanese universities have traditionally been oriented in undergraduate studies although research is still geared towards solving community based problems. Martin (2000) recognised that universities should increasingly play a vital role in applying innovation and research to address socio-economic problems and promote innovation for economic growth embracing strong strategic partnerships with the productive economic sector and national systems of innovation. Chatterton and Goddard (2001) used collaborative research as an umbrella term for methodologies that actively engage communities and policy makers in the research process. This implies that the university researchers, community-based organizations, and policy makers work together to frame the problems to be tackled and the questions that need to be answered. They also undertake the research and give interpretation for the results in terms of their valuable contribution for community and policy change as well as disseminate the research findings and advocate for change. Collaborative research should engage scholars where university researchers, community members, and policy makers respect the knowledge that each partner brings to the discussion so that jointly they come to understand the complex problems facing communities and how to design and implement research-based solutions to those problems. Research is one of the core pillars of the university system. It is critical to enhance publication of research findings in credible and peer reviewed journals as one of the ways of widely disseminating research findings to stakeholders. Court and Ghai (1974) noted that research and publishing by faculty has sharply dropped over the last few years. Due to heavy teaching responsibilities, brought about by the rising student numbers, plus the need to

undertake part time teaching so as to make some extra money to supplement the meagre pay, faculty are not keen on undertaking meaningful research and publishing their work. Different organizations use varying measures of performance. These measures may be quantitative or qualitative. Kaplan and Norton (2008) introduced balance scorecard which considers financial non-financial measures of performance such as internal business process, learning and growth and customer perspective. This study has appropriately used balanced score card to measure university performance.

LITERATURE REVIEW

Resource based approach asserts that firm differences arise from situations where firms actively seek to differentiate themselves through their unique competencies and capabilities (Grant, 2010). He defined strategy as the link between the firm and its environment. It is broadly defined to include both goals and means of achieving them. Mintzberg (1987) proposed five definitions of strategy, namely; strategy as a plan, a ploy, a pattern, a position and a perspective. According to Johnson and Scholes (2006), strategy is the long term direction and scope of an organization. Strategy therefore consists of the means an organization opts to move from its current state to the future. It focuses on future performance as an organizational link with the external environment and considers internal resources in order to attain a competitive advantage. Theories of strategy postulate specific explanations why organisations within particular industries have variations in their performance. For instance, the market positioning framework perceives deviations between firms as emanating from the diverse characteristics of the markets they operate in. According to Yusuf (2007), linkages between higher institutions and industry sector is critical for skills development through education and training, acquisition, and adoption of knowledge through innovation and technology transfer, and the advancement of entrepreneurship. Generally, there is limited knowledge about the relationships between university education and industry sector in Africa. Empirical studies of university and industry linkages have majorly focused their on technologically developed countries. This is due to the fact that these linkages normally involve sophisticated research and innovation. Higher learning institutions in most developing countries, specifically in Africa, are thought to have inadequate ability to engage more actively with industry players in research (Sall, 2012). According to Jones, et.al. (2007), University research capacity is critically limited in African context. This limitation is replicated within regions and country variations. He defined research capacity as the institutional and infrastructure, regulatory frameworks, investment, and sufficiently skilled people to carry out and publish research findings. He further observed that this varies greatly across the continent. Rand Corporation report (2001) notes that, with the exception of South Africa, Egypt, Mauritius, and Benin, African countries were part of a group of scientific laggards. Notably, the industry sector cannot manage to operate in isolation. It must foster linkages with the Universities in order to exploit synergistic energies. This is because it requires qualified manpower to provide necessary services. Universities on the other hand, cannot ignore industry which is the consumer of the research generated knowledge and products. It is paramount for researchers to continue examining and recommending ways and means in which University-industry research collaboration opportunities can be exploited.

HYPOTHESES OF THE STUDY

1. There is a significant positive correlation between research policy orientation and University performance.
2. There is a significant positive correlation between research output dissemination and University performance.
3. There is a significant positive correlation between postgraduate research orientation and University performance.
4. There is a significant positive correlation between research publications and University performance.
5. There is a significant positive correlation between joint collaborative research and University performance.

RESEARCH METHODS

Research Design

The study adopted descriptive cross-sectional survey design. Irungu (2007) posited that descriptive cross-sectional survey is most appropriate where the main objective is to establish if significant relationships among variables exist at some point in time. The cross-sectional approach involved collecting and comparing data from the phenomena as at the time of study. The combination of qualitative and quantitative data enabled adequate explanation of the variables and predictions in their behaviour without resorting into inquiries of the temporal effect. The design enhanced uniform data collection and comparison across respondents.

Study Population

As at the time of this study, there were a total of sixty five (65) universities operating in Kenya according to Commission for University Education report (2013). Thus, population of this study comprises 65 public and private universities incorporated in Kenya. From the 65, forty seven (47) universities which had undergone at least one (1) graduation cycle were sampled. Out of this, twenty two (22) were public and twenty five (25) were private universities. This sample size of 47 constitutes 72% of the population and it is way above the required 10% as a representative sample for a homogenous population. According to Kothari (2004), a population sample constituting 10% and above is appropriate if the researcher is dealing with a homogenous population.

Data Collection

Both primary and secondary data were collected and used in the study. Primary data were obtained from responses to the questionnaire. The respondents completed the questionnaire by themselves over an agreed and specified period, after which the researcher picked the feedback. In other cases where appropriate, the respondents completed the questionnaires in the presence of the researcher. Secondary data comprised data sets that were already available in Universities and other places previously collected for other use other than the current

study. Secondary data was mainly obtained from Global University webomatrics ranking‟s web-site. Some respondents also tabulated data on performance from existing records. A semi-structured questionnaire was used to collect data. The questionnaire for this study was designed on a five point likert-type scale. The responses were 1=strongly disagree, 2=disagree, 3=not sure, 4=agree and 5=strongly agree.

Data Analysis

In order to undertake comparative analysis between private and public universities, independent sample t-test, standard deviation, arithmetic mean and coefficient of variation (CV) were used. C.V was used to measure variability and consistency in scores of different universities when arithmetic mean and standard deviation is compared. Correlation analysis was used to check the nature and direction of relationships between independent and dependent variables.

RESEARCH RESULTS

Questions were formulated to investigate on the orientation of research policy, frequency of university- industry collaborative research projects, research output dissemination, postgraduate research orientation, sharing of research findings in academic conferences, fusion of research findings in the academic curriculum and frequency of research publications. Table 1 shows the descriptive statistics for each item.

Table 1: Descriptive Statistics on Collaborative Research Items

Variable	Frequency			Mean Score			Standard Deviation			Coefficient of Variation (CV)		
	Pu	Pr	Co	Pu	Pr	Co	Pu	Pr	Co	Pu	Pr	Co
Use of research policy developed with focus on industry needs	21	23	44	3.6	4.1	3.9	1.4	1.5	1.4	38	37	37
Frequency of university-industry collaborative research projects	21	23	44	3.5	4.0	3.8	1.1	1.6	1.4	32	39	37
Frequency of disseminating of research output	21	23	44	3.2	4.2	3.8	1.3	1.5	1.4	39	35	39
Link between postgraduate research and solution of industry based problems	21	23	44	3.4	4.1	3.8	1.2	1.4	1.3	34	34	36
Frequency of sharing of research findings in academic conferences	21	23	44	3.2	4.1	3.7	1.3	1.6	1.5	42	39	42
fusion of research findings in the academic curriculum	21	23	44	3.3	4.1	3.8	1.4	1.5	1.5	41	37	39
Frequency of research publications.	21	23	44	3.2	4.2	3.7	1.3	1.3	1.4	42	32	38
Average	21	23	44	3.3	4.1	3.8	1.3	1.5	1.4	38	36	38

Key: pu-public universities; pr-private universities; Co-combined (all universities)

As shown in table 1, private universities recorded stronger linkage strategies in the area of collaborative research (mean score of 4.1 and variability of 36%) compared to public universities (mean score of 3.3 and variability of 38%). Private universities also recorded higher mean scores in all the seven determinants of collaborative research compared to public universities. Apart from the question on the frequency of university-industry collaborative research where public universities have a lower variability of 32% compared to 39% in public universities, the private universities recorded lower variability in all the other six determinants, indicating greater consistency and stability in the responses compared to public universities. In general, the combined mean score on curriculum orientation for all private and public universities is 3.8 out of 5 which approximates to 76% on a percentage scale.

The mean scores for the University performance indicators were compared by computing independent sample t statistic for equality of means at 95% level of confidence and 42 degrees of freedom to test the significance of the difference between sample means of private and public universities. As shown in table 1.2, the average value of the sample t-test (-8.23) is less than 2.5 and significance level (0.472) is greater than 0.05 indicating significant difference between the private universities' performance mean score and that of the public universities.

Table 2: Independent Samples t Test for Equality of Means on University Performance

Variable	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference Lower	Upper
Net surplus	-1.025	42	.311	-.35404	.34557	-1.05142	.34334
Total amount of scholarship awards or grants for students	-.101	42	.920	-.03727	.36854	-.78102	.70648
Total number of Students	-.469	42	.642	-.18841	.40173	-.99912	.62231
Supervisor to Student ratio	-1.592	42	.119	-.63975	.40194	-1.45090	.17140
University webometrics ranking in Kenya	-1.751	42	.087	-.59420	.33938	-1.27909	.09069
Average	-0.82345	42	0.472364	-0.31018	0.3835	-1.08412	0.463755

Table 3 indicates that private universities generally perform better (mean score of 3.7 out of 5) than public universities (mean score of 3.3 out of 5). The overall mean score of university performance for both public and private universities is 3.5 out of 5 with the lowest score of 3.0 for webometrics ranking. Private universities have lesser variability in all performance indicators compared to those of public universities. This demonstrates that the responses on performance from private universities were more consistent and better than public

universities. Among public universities, responses on net surplus were the most consistent with smallest variability of 35.3% and largest variability of 42.4% in total number of students. Among private universities, responses on net surplus were also the most consistent with smallest variability of 28.9% and largest variability of 37.1% in total number of students. When the universities are combined, responses on net surplus remained the most consistent with the smallest variability of 30.6% and largest variability tied at 40% in supervisor to student ratio. The findings imply that net surplus is the most stable indicator of university performance.

Table 3: Descriptive Statistics on University Performance

Variable	Frequency			Mean Score			Standard Deviation			Coefficient of Variation (CV)		
	Pu	Pr	Co	Pu	Pr	Co	Pu	Pr	Co	Pu	Pr	Co
Net surplus	21	23	44	3.4	3.8	3.6	1.2	1.1	1.1	35.3	28.9	30.6
Total amount of scholarship awards or grants for students	21	23	44	3.6	3.6	3.6	1.3	1.2	1.2	36.1	33.3	33.3
Total number of Students	21	23	44	3.3	3.5	3.4	1.4	1.3	1.3	42.4	37.1	38.2
Teacher to Student ratio	21	23	44	3.5	3.7	3.6	1.4	1.2	1.3	40.0	32.4	36.1
Supervisor to Student ratio	21	23	44	3.1	3.8	3.5	1.3	1.4	1.4	41.9	36.8	40.0
University webometrics ranking in Kenya	21	23	44	2.7	3.3	3.0	1.1	1.2	1.2	40.7	36.4	37.1
Total number of stakeholder conferences held	21	23	44	3.4	3.6	3.5	1.3	1.3	1.3	38.2	36.1	37.1
Total number of collaborative activities with other institutions held	21	23	44	3.4	3.6	3.5	1.4	1.2	1.3	41.2	33.3	37.1
Total number of industry visits made	21	23	44	3.4	3.8	3.6	1.3	1.4	1.3	38.2	36.8	36.1
Total number of guest speakers hosted	21	23	44	3.5	3.8	3.7	1.4	1.4	1.4	40.0	36.8	37.8
Performance of our university has greatly increased over the past five years	21	23	44	3.4	3.9	3.7	1.2	1.1	1.2	35.3	28.2	32.4
Average	21	23	44	3.3	3.7	3.5	1.3	1.2	1.3	39.0	34.2	36.3

Key: pu-public universities; pr-private universities; Co-combined (all universities)

Correlation Analysis between Linkage Strategies and University Performance

Correlation analysis was conducted to establish nature and direction of relationship between each of the research orientation indicators and University performance. The results are shown in table 4. Research output dissemination has the strongest positive correlation with University performance with Pearson's correlation coefficient (r) = 0.919 and the correlation is significant at p value (0.000) < 0.05. ***Hypothesis 2 was therefore accepted that there is a significant positive correlation between research output dissemination and University performance.***

Research policy orientation is the second after research output dissemination with Pearson's correlation coefficient (r) = 0.895. The correlation is significant at p value (0.000) < 0.05. ***Therefore, hypothesis 1 was also accepted that there is a significant positive correlation between research policy orientation and University performance.***

The third strongest indicator of University performance after research policy orientation is research publication with r= 0.868. The correlation is also significant with p value (0.000) < 0.05. ***Hypothesis 4 was therefore accepted that there is a significant positive correlation between research publications and University performance.***

The last indicator is postgraduate research orientation with r=0.864. This also shows strong positive correlation with University performance and the correlation is also significant with p value (0.000) < 0.05. Thus, ***hypothesis 3 was accepted that there is a significant positive correlation between postgraduate research orientation and University performance***

Table 4: Correlations between Collaborative Research Indicators and University Performance

		University Performance
University Performance	Pearson Correlation	1
	Sig. (2-tailed)	
	N	44
Research Policy Orientation	Pearson Correlation	.895**
	Sig. (2-tailed)	.000
	N	44
Research Output Dissemination	Pearson Correlation	.919**
	Sig. (2-tailed)	.000
	N	44
Postgraduate Research Orientation	Pearson Correlation	.864**
	Sig. (2-tailed)	.000
	N	44
Research Publication	Pearson Correlation	.868**
	Sig. (2-tailed)	.000
	N	44

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

Further correlation analysis was done after aggregating the variables as composite indices. When Pearson's product moment correlation coefficient (**r**) was computed, it was established that there exists high positive correlation between collaborative research and University performance with Pearson's correlation coefficient (r) = 0.882, which is greater than 0.7 as shown in table 5. The correlation is significant at p value (0.000) < 0.05. ***Hypothesis 5 was therefore accepted that there is a significant positive correlation between joint collaborative research indicators and University performance.***

Table 5: Correlations between Collaborative Research and University Performance

		University Performance
Collaborative Research	Pearson Correlation	.882**
	Sig. (2-tailed)	.000
	N	44

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

DISCUSSION

Correlation analysis indicates that there exists high positive correlations between research strategies and University performance. This demonstrates that strategic choices with strong industry linkage components yield superior organizational performance while strategic choices with weak linkage orientation lead to poor organizational performance. Chatterton and Goddard (2001) Studied 35 universities in Britain to investigate the use of the resource based view and knowledge based view to improve the understanding of the process for the initiation and function of university and industry collaboration. Findings confirmed the persistent lack of an integrative framework for the management of research collaborations and proposed a model for university and industry collaborative research. These findings agree on the fact that collaborative research is paramount in determining university performance. Generally, private universities recorded stronger scores in most variables compared to public universities as analysed in descriptive statistics. The coefficients of variation values are favourably lower among private universities thus indicating more consistency and stability in variable scores. It is clear from the findings that universities can only remain relevant if they respond promptly to the changing technology and new economic sector demands, by formulating industry based research policies in order to counter competition challenges and strive to attain and maintain a competitive edge over the rivals in all areas of operation.

IMPLICATION OF THE STUDY

The study findings have theoretical, practical and policy implications for future researchers, university authorities and all stakeholders. Resource-based view (RBV) as the main theory anchoring the study provides a favourable model for analysing the appropriate strategies that can provide effective University research and industry linkages. Although private Universities seem to have performed better than public ones, there is need to foster more

collaborative research across all universities in order to exploit the synergistic benefits of sharing research facilities. For practice, the study highlights the most significant components of strategy that impacts on university performance. Dissemination of research output with a focus of collaboratively providing solutions to community challenges, publication of research findings in refereed journals and industry based postgraduate research projects have been established as significant predictors of university performance. The University authorities must therefore strategically link these indicators to the industry by involving stakeholders in strategy formulation and implementation process, in order to come up with effective industry based research policy. The universities' decision makers should therefore reinforce collaborative research as a critical component of linkage strategies. Research should keep abreast with teaching and should help to raise the quality of higher education, in particular, and of social life, in general. Attention must be paid to improving both basic and applied research, furthering work on advanced technologies of critical social and economic needs, improving the preparation of researchers, setting up adequate structures for the coordination, dissemination and publication of research results, working to make research activities an integral part of institutions' public service functions, and reducing duplication through inter-institutional cooperation involving both researchers and facilities. It has been suggested that the quality of research produced in African universities is rather poor, not only due to the lack of adequate funds and facilities, but also because teachers are not well prepared to do research (Thiam, 1992). Universities must seek to acquire resources to support academic staff travel for participation in professional conferences and training programmes. It is important that there be serious consideration of investment in research that will enhance the capacity of universities in the region in order to further national development. Organisational policies should take into consideration, the needs and demands of the industry that it serves rather than focus on performance in isolation. Research policies should be built around finance and management, teaching and curriculum and faculty development to address issues such as excessively rapid growth of enrolments, inadequate facilities and equipment, the need for human resource development (including improving qualifications and pedagogical skills of teachers), improving the conditions of work in universities, and improving the fit between higher education and the world of work and making institutions more cost-effective. University research is often disconnected from the local research environment and experts. There is therefore, need to review the legal framework, protocol and conventions that set up these institutions to allow for more collaboration with the universities and local researchers. There is need to establish a national policy on university-industry collaborative research and promotion of innovative knowledge transfer mechanisms. This would involve development of policies for creating spin-off companies to utilize university patents and licenses and establishment of IPR management offices in each university and support the establishment of joint university-industry incubation centres. Kenya has established several research institutes and middle level colleges whose activities are not synchronized with the universities research. Often, some research institutes have very well equipped research laboratories. In some instances, some universities have better equipped research facilities. Sharing of these resources would benefit both and improve national innovation activities.

REFERENCES

Chatterton, P. & Goddard, J.B. (2001). The Response of universities to Regional Needs. *European Journal of Education, Research, Development and Policies.* 35. 460-475.

Commission for University Education (2013). Status of Universities Operating in Kenya. Retrieved from http://www.che.or.ke/contactus.html

European Commission Report (2007). Improving Knowledge Transfer between Research Institutions and Industry across Europe. Retrieved from http://ec.europa.eu/invest-in research/pdf

Eshiwani, G.S. (1999). *Education in Kenya since Independence.*Nairobi. East African Educational Publishers.

Ghai, D. & Court, D. (1974). *Education, Society and Development: New Perspectives from Kenya.* Nairobi. Oxford University Press.

Ginies, P. & Mazurelle, J. (2010). Managing university-industry relations: A study of institutional practices from 12 different countries. *Journal of Higher Education*. 5. 7-10.

Irungu, S.M. (2007). *The Effect of Top Management Teams on the Performance of Publicly Quoted Companies in Kenya.*Unpublished PhD Thesis, School of Business, University of Nairobi, Kenya.

Jones, N., Bailey, M. & Lyytikäinen, M. (2007). Research capacity strengthening in Africa: trends, gaps and opportunities. DFID & IFORD. Retrieved in September 2013 from http://www.odi.org.uk/sites/odi.org.uk/files/odi-assets/publicationsopinion-files/2774.pdf**.**

Kaplan, R.S. & Norton, D.P. (2008). *The Balanced Score Card*. Harvard Business School press. Boston. MA.

Kothari, C.R. (2004). *Research Methodology: Methods and Techniques*. (2nd Ed.). New Age International Limited. New Delhi.

Martin, M. (2000). *The Management of University-industry Relations: Five institutional Studies from Africa, Europe, Latin America and the Pacific region*. Paris: UNESCO

Ogawa, Y. (2002). Challenging the Traditional Organization of Japanese Universities. *University Journal*. 43. 85 – 108.

RAND Corporation. (2001). Science and Technology Collaboration: Building Capacity in Developing Countries? RAND. Retrieved in September 2013 from http://www.rand.org/content/dam/rand/pubs/monograph_reports/2005/MR1357.0. pdf

Sall, A. S. (2012). Mutations de l'enseignement supérieur en Afrique: Le cas de l'Université Cheikh Anta Diop de Dakar. Dakar: L'Harmattan

Thiam, C. (1992). Pedagogical Management: A Fundamental Dimension of the Management of Higher Education Institutions. *Journal of Higher Education*. 13. 193-212.

Yusuf, S. (2007). University-Industry Links: Policy Dimensions. In How Universities Promote Economic Growth. 1–26. Washington DC. World Bank.