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QUALITY AS A CRITICAL SUCCESS FACTORS FOR BUSINESS PROCESS RE-ENGINEERING AND ACADEMIC PERFORMANCE: A CASE OF HIGHER EDUCATION INSTITUTIONS IN KINSHASA, DEMOCRATIC REPUBLIC OF CONGO (DRC)

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Abstract

The purpose of the research was to examine the influence of quality on academic performance taking a case of higher education institutions in Kinshasa, Democratic Republic of Congo (DRC). The study's application of Business Process Re-engineering (BPR) principles to the academic sector, particularly by viewing quality as a critical success factor, represents an innovative and impactful approach to enhancing academic performance. The study was based on total quality management theory. Quality significantly and positively has an influence on academic performance of higher education institutions in Kinshasa, DRC. Quality also showed a significant positive relationship with academic performance (β=287.651, p<0.001, R^2=0.578).The study concluded that quality significantly influence academic performance in Kinshasa's higher education institutions. Quality improvements, including investments in infrastructure and modern equipment, are crucial for enhancing educational outcomes. The study recommended enhancing orientation and selection processes to better support student transitions and ensure a merit-based admission strategy. Additionally, sustained investment in infrastructure and modern educational equipment is essential to maintain a high-quality learning environment.

Keywords: Business process re-engineering, higher education, quality, academic performance

INTRODUCTION

To improve the quality of education and achieve performance objectives in higher education institutions, Business Process Re-engineering is proposed in this study as a management strategic tool for enhancing quality education and achieving performance. Higher education institutions, both private and public, are currently adopting and adapting re-engineering approach to improve their teaching, research, and administrative as the three main processes to achieve academic excellence. Managers of educational institutions in the world are utilizing various strategic management approaches used in the business sectors such as total quality management, Lean Six Sigma, Six Sigma, Benchmarking, restructuration, and Kaisen to enhance the quality of education and achieve performance. This research study aimed to examine quality factors, which is a crucial component for Business Process Re-engineering (BPR), a strategic management tool, can be effectively used to improve academic performance in Higher Education Institutions (HEIs) in Kinshasa, Democratic Republic of Congo

Higher education institutions across the globe are increasingly embracing business-oriented management strategies, such as Business Process Re-engineering (BPR), in order to enhance key performance indicators such as cost, quality, service, and speed. Educational

institutions, just like any other business, must adapt their institution to effectively tackle challenges in a competitive landscape. This necessitates meticulous planning and execution of suitable change management strategies. The utilization of BPR in educational institutions has proven to be a potent instrument in driving essential organizational transformations to gain a competitive edge. Numerous organizations that have implemented BPR have reaped rewards such as revamped organizational structures, cost and time savings, enhanced profitability, improved service quality and performance, streamlined operations, increased student enrollments, and higher graduation rates.

According to Dey (2001), Business Process Re-engineering is a strategic methodology that focuses on enhancing organizational efficiency and effectiveness by fundamentally redesigning critical business processes. Business Process Re-engineering is an approach where processes are re-structured, re-designed and re-engineered so as to maximize an organization's potential (Rajabion et al., 2010). This study focuses on the re-engineering aspect of the academic administrative process, specifically addressing quality factors that hinder higher education institutions in the Democratic Republic of Congo from attaining optimal performance.

Several definitions suggest that Business Process Re-engineering (BPR) is an offshoot of Business Process. BPR has frequently been used since it was first introduced in the United States in the 1990s. The concept of BPR was first used in Hammer"s article: Reengineering Work: Don't Automate, Obliterate (Hammer, 1990). The concept of BPR aims at enabling organizations improve productivity and relationships with customers, and reduce time to launch new products and services in terms of cost, quality, customer satisfaction and shareholders value by identifying and re-engineering the important processes of the organization . It is a way in which organizations become more functional by identifying the critical business processes, analyzing these processes and redesigning them for efficient improvement and benefit (Uchena & Joel, 2021).

According to Cohen and Mehta (2017), the implementation of Business Process Re-engineering initiatives in the education sector is crucial for cost reduction, service quality improvement, and the achievement of efficiency and effectiveness. As the research is focused on how quality which is a critical component of Business Process Re-engineering can enhance quality services and achieve performance, the question we can ask ourselves is whether all the proposed restructuration and reforms of higher education institutions in DRC have contributed to enhancing quality of education and achieved performance? The answer to this question is provided by many studies among others is (Batika, 2015) who argued that the mission of higher education institutions in the Democratic Republic of Congo is to contribute to the economic, social and cultural progress of the country, to provide general education for citizens, and to

ensure high-level professional preparation and scientific research and service to the community. Higher education institutions have trained many graduates in a variety of fields. Currently, none of these missions are being accomplished. Consequently, in order to tackle the ongoing issues regarding the performance of Higher Education Institutions (HEIs), the research employed Business Process Re-engineering (BPR) as a strategic management tool to enhance the quality of services, boost efficiency and effectiveness, adapt to the competitive educational landscape, and analyze the direct impact of the study variables on institutional performance.

Statement of the problem

Education is vital for socio-economic, cultural, and political development of the country. According to the 2018 publication of Le Cadre Normative du System LMD by the Ministry of Higher Education in the Republic the Democratic Republic of Congo, the country has 902 higher education institutions, 408 public and 494 private. Only 21% are considered viable, leaving 79% in question (Republique & Du, 2018). The 2018 World Bank report highlights the need for significant improvements in the higher education sector, with half of university students dropping out before their third year. Obstacles include low-quality institutions, governance issues, inadequate infrastructure, overcrowded lecture halls, curriculum mismatches, and a significant student-to-teacher ratio disparity. The completion rate is around 60 percent. The average age of qualified staff within the system is 65. Programs that target skills complementary to key growth sectors in the economy attract few students (World Bank, 2018).

Empirical studies have identified various critical problems affecting the performance of higher education institutions in the Democratic Republic of Congo. These include concerns about the quality of education, deterioration of the education system, insufficient teaching and learning facilities, inadequate libraries and laboratories, as well as a shortage of skilled and competent human resources (De Herdt and Titeca (2016); (Etshim (2017); Kilongo and College (2020); Mitonga-Monga and Mayer (2020); Republique and Du (2018); Teferra and Altbach (2004). A recent examination of higher education institutions conducted by Gudiño León. et al. (2021) highlighted ongoing challenges such as an outdated educational system, low education standards, and poor academic performance.

There are two major studies have been carried out to improve the performance HEIs by Olabimtan, R. O. and Omojaro (2019) on Business Process re-engineering and Federal Tertiary Institutions' Competitive Advantage: Evidence from Federal Polytechnic, Ilaro State in Nigeria. Another study done by Harb and Abazid (2018) on An Overview of Business Process Re-engineering in higher education in Turkey. These are the recent key studies conducted one in Africa and another in Turkey on Business Process Re-engineering to improve the performance

of HEIs. This research contributes to the broader academic discourse within the strategic management domain by examining the essential quality factors that influence the performance enhancement of higher educational institutions. Quality is integral to the administrative processes that must be re-engineered in higher education institutions to attain improved academic outcomes. Additionally, Ahmad et al.(2007) investigated BPR in both Malaysia and the United Kingdom, among other locations. This research addresses a significant contextual gap.

Objective of the study

The primary aim of this research was to investigate the potential influence of Business Process Re-engineering on the academic performance of higher education institutions in Kinshasa, Democratic Republic of Congo. The study's specific objective was to assess the relationship between quality and academic performance.

Research hypothesis

Based on the specific objective, the study investigated the following null hypothesis:

H_{01}: There is no relationship between quality and academic performance.

LITERATURE REVIEW

Quality education is a comprehensive concept that encompasses multiple dimensions. These include the teaching method, the presence of academic support personnel, financial resources, physical infrastructure, the content and organization of the curriculum, and the pedagogical methods employed. Additionally, it involves the academic readiness of students (Glennie, 2016).

The literature review discusses the variable quality in relation to academic performance. Quality variable in this study is measured through physical aspects (facilities, infrastructures, equipment, supports service, class size,); reliability (accuracy, consistency, trustworthiness, time punctual); competence (knowledge, expertise, communication, method of teaching); personal interaction (friendship, concern, caring, career counseling); course structure (relevance, adequate coverage, the conceptual knowledge) and policy (fee structure, training and placement, courtesy, financial support) SERQUAL model was used (Parasuraman et al., 1985). Higher education institutions are challenged to adapt the program structures, curricula, teaching, and learning methods to account for a new necessary range of aptitudes. These aptitudes include flexibility, communication, and motivation (Materu, 2007). The main problem surrounding higher education in Sub-Saharan

Africa is the poor quality of higher education institutions. The quality of the education is affected by the lack of governmental infrastructure and funding (Drape et al., 2016). Higher education institutions in Africa, with the exception of South Africa, lag far behind their own needs in terms of researchers and lecturers. The result is a downward spiral: vast lecture halls brimming with students; underqualified and overworked professors; and consequently a lack of locally produced research to improve the quality education and achieve academic performance (Adu & Nordic, 2020). Mbithi et al. (2021) highlighted the urgent need for urgent examination of sub-optimal infrastructure in higher education institutions in Sub-Saharan Africa, which accounts for 30-60% of negative effects on productivity. The 2021 Webometrics world university ranking shows eight of the top universities in Africa are in South Africa, highlighting the need for improved quality, relevance, and flexibility of academic programs. Higher education quality is a critical issue due to increasing demand from students, parents, employers, and society. Challenges include curriculum development, lack of research-experienced faculty, brain drain, heavy teaching load, moonlighting, and inadequate resources in African universities (Mulenga ,2020). Balakrishnan (2011) pointed out to the influence of quality of lecturers, quality and availability of resources, and effective use of technology on the student satisfaction. Avram & Avram (2011) point out to teachers' ability to transmit innovative information, their capability to communicate with students, their involvement in teaching process, and their being volunteer to provide useful study materials. Beine et al. (2013) found that the prestige of the university (ranking) as a proxy for the quality of university to be an important determinant of international students

Quality teaching and academic staff is one of the critical success factors in higher education to achieve academic performance. Teferra and Altbach (2004) reported that there are twice as many nonacademic support staff as there are academics, and more than 60 percent of the institution's budget goes to staff costs. The financial resources of the university are, therefore, mainly used on nonteaching personnel costs. In Togo, Teferra and Altbach (2004) reported that there are 1,136 administrative and technical staff in higher education institution, yet the academic staff numbers fewer than 730, of whom only 55 percent are full-time. While the number of nonacademic staff is high, they face several problems, including overstaffing and lack of communication between the different services and the students. The number of nonacademic personnel and the proportion of resources allocated to this sector are disproportionately high, and the quality and performance of the administrative cadre leaves much to be desired. Training and skills development for the nonacademic staff are rarities. While the nonacademic staff of African educational institutions are crucial, their disproportionate presence takes away the resources needed for

the basic functions of universities: teaching and research. In countries where such resources are very scarce, universities must consider minimizing this significant and unsustainable fiscal burden in order to direct resources to the priority areas.

The quality of higher education institutions in Africa is hindered by a significant scarcity of teaching and research personnel, resulting in a low level of educational standards. For example, in Nigeria and Zambia, only 16,856 out of 72,704 staff are academic, with 1,280 being non-academic and 890 academic. This understaffing affects the core business of institutions (Mulenga, 2020). Phiri et al. (2020) argued that high numbers of non-academic staff in institutions lead to issues like overstaffing, lack of office space, poor communication, and delayed salaries. They often have better service conditions than academic staff and can control university policies, affecting teaching, research, innovation, industrialization, and public service. The Ugandan higher education sector faces challenges such as inadequate staffing, outflows, deteriorating salaries, inadequate housing, transport, and a freeze on recruitment. Many teachers lack postgraduate training and research experience, and many remain moonlighting due to low salaries, making commitment difficult in private institutions.(*The National Council for Higher Education and the Growth of the University Sub-Sector in Uganda, 2002–2012*, 2012)**.** Financial resources significantly influence academic performance in higher education institutions. In African countries, governments adjust annual budgets based on previous years' budgets. Formula funding, based on student cost, can stimulate improvement and improve accountability. However, high tuition fees are now the norm. Financial models, diversification of funding sources, business mindset, and entrepreneurship are essential for quality higher education (Mulenga,2020). According to (Acquah, 2021), in order to generate more income, institutions concentrate more on attracting international students into their programs, which raises their status on the international rankings of schools (Lee, 2010). For example, international students contributed 41 million dollars to the U.S. economy in 2018/2019.

Based on the literature review, quality related factors that either prevent or enhance higher education institutions to achieve academic performance have been discussed from the global, regional and local perspectives. Based on the literature, quality of program/curriculum (Fauzi et al., 2020; Kessy, 2020; Nyangau, 2014), quality of teaching and administrative staff (Etshim, 2017; Mbithi et al., 2021; McCowan, 2018), quality of physical infrastructures (Altinkemer et al., 2011; Halili et al., 2021; Ikon et al., 2018; Letting & Mwikya, 2020) , financial resources (Acquah, 2021; Iphigénie, 2020; Mulenga, 2020; Odide, 2021) , relevance and policy (Boit & Kipkoech, 2012; Nukunah et al., 2019; Savoie, 2012) have a positive and significant influence on academic performance.

THEORETICAL REVIEW

Total quality management (TQM) theory

The foundation Martínez-Lorente et al. (1998) stated that TQM had its roots in 1949 when the Union of Japanese Scientists and Engineers established a committee to enhance Japanese living standards in the aftermath of the war. It wasn't until approximately 1980 that American companies began embracing TQM on a larger scale.

Total Quality Management was created in the mid-1980s to improve the quality of Japanese company-wide quality control (CWQC) through benchmarking. This method enabled Japanese industries to gain a competitive advantage and expand into Western markets previously dominated by Western companies. Consequently, American firms faced stiff competition from Japanese and Asian rivals, leading them to emulate Japanese CWQC practices (Aized, 2012).

The theory of Total Quality Management (TQM) was developed by Edwards Deming and Joseph Juran, as stated by (Martínez-Lorente et al., 1998). Additionally, the author asserts that the evolution of TQM was influenced by reputed Western quality specialists like Deming, Juran, Feigenbaum, and Crosby, placing significant importance on attaining customer satisfaction. TQM can be applied in competitive organizations such as higher education institutions to enhance the quality of service for students in a competitive educational setting.

According to Milenkovska and Novkovska (2019) the objective of a total quality management system within higher education is to effectively attain the institution's goals while meeting the needs of users at a reasonable cost for the services provided. This system encompasses a series of activities that are consistently carried out to achieve the specified objectives. In the view of In'airat and Kassem (2014), total quality management encompasses the comprehensive management of all institutional principles, procedures, structures, and the individuals impacted by the quality of products or services. TQM serves as a highly effective instrument in the realm of educational standards and practices. The challenge lies in guaranteeing that every student benefits from the educational process by providing them with sufficient time, support, encouragement, resources, and opportunities to achieve and meet the established standards of excellence within a total quality framework.

The research conducted by Yusuf (2023) indicated that total quality management has a significant impact on the quality of higher education across various nations. This is evidenced by the effect size derived from 26 publications, which demonstrate considerable heterogeneity and an effect size value that can be classified as exceptionally strong. TQM serves as a strategic management approach that offers a structured framework and essential tools for quality management, playing a crucial role in the advancement of higher education.

As noted by Berg (2011) researchers have reached a consensus that the adoption of total quality management (TQM) within higher education institutions has proven effective and has enhanced educational quality. Therefore, the introduction of TQM in the educational sector implies that the quality of graduates will reflect the overall effectiveness of the educational processes within the university.

Academic performance can be enhanced by meeting students' needs and expectations. The TQM theory is essential for higher education institutions to stand out and gain a competitive edge. Through technology, educational institutions can identify necessary improvements to address challenges related to student academic performance and quality education. TQM is a philosophy based on Japanese quality principles, which emphasizes the importance of meeting customer needs and expectations from the beginning. By concentrating on improving all aspects that can contribute to quality education or reduce course or degree completion time, higher education institutions can better serve students and achieve performance (Yang, 2012).

The study suggested that policymakers and managers in higher education institutions should grasp the principles of TQM theory and embrace it as a comprehensive strategy to fulfil and exceed the requirements of students and stakeholders. Given the intensifying competition within the educational sector and the increasing expectations of customers for high-quality services Ansar 2017. Consequently, TQM theory supports this study by encouraging higher educational institutions management to adopt a comprehensive approach to quality, rooted in the principles of total quality management theory such as top management support, customer and supplier relationships, employee involvement, product designs, benchmarking, quality data and reporting.

According to existing literature, a variety of factors and theories are essential for the promotion of quality education. At the core of total quality management (TQM) theory is a sustained culture of continuous improvement. This culture fuels the ongoing efforts of higher education institutions to enhance performance in critical areas such as the admissions process, the development of a safe and supportive learning environment, human resources, infrastructure, the strengthening of relationships among students, faculty, and administration, and the effective management of stakeholders, all of which contribute to improved academic performance. Higher education institutions can enhance their commitment to quality by adopting and implementing TQM principles. Additionally, the admissions and orientation processes can be redesigned to facilitate a smoother transition for students from secondary schools, ensuring they feel welcomed and integrated into their new academic environment. As noted by Ülker (2023) the ISO 21001 TQM system has been purposefully developed to cater to the needs of

higher education institutions. In the face of the rapid changes brought about by Industry 4.0, where previously established rules and policies may no longer be applicable, universities are tasked with the critical role of reassessing and refining their TQM practices to ensure they maintain high standards of quality in a competitive environment.

Total quality management can be encapsulated in two key components: quality enhancement and stakeholder engagement. Quality enhancement: TQM prioritizes the advancement of the quality of educational processes and results. This methodology can result in the refinement of teaching strategies, curriculum development, and administrative process, all of which contribute to enhanced academic achievement. Stakeholder engagement: It underscores the importance of involving all stakeholders such as students, educators, administrators, and parents in the quality enhancement process, fostering a collaborative and inclusive framework for educational improvement.

RESEARCH METHODOLOGY

The research was grounded in the principles of positivist philosophy. A comprehensive census survey was conducted to collect data from every higher education institution in Kinshasa. The study spanned from August 2022 to May 2023. Primary data for the study was obtained from the Registrars and Directors of Quality Assurance of all higher education institutions in Kinshasa. The sample population of the study consisted of 57 higher education institutions in the City of Kinshasa both private and public. Quantitative data from this study was collected from primary source. Questionnaire was used to collect quantitative data. Questionnaires were distributed to all 114 (respondents 57 Registrars and 57 Directors of quality assurance) of HEIs. Out of these, 101 questionnaires were completed and returned (46 registrars and 55 Directors of quality assurance), while 10 were incompletely filled, and three were never returned. The questionnaires were measured on a 1-5 Likert scale, where 5= strongly agree, 4= agree, 3= indifferent, 2= disagree 1= strongly disagree. The sub-variables of quality were derived from the SERVQUAL model, encompassing physical infrastructure, content/course structure, competence and qualification, as well as personal interaction. These quality indicators were assessed to determine their impact on enhancing students' academic performance. The overall response rates was calculated at 89%%, which significantly exceeds the typically recommended response rate for surveys.The researcher employed factor analysis as the primary tool for data analysis and furthermore, quantitative analysis was done. After factor analysis, descriptive statistics (frequencies, percentages, averages, mean, standard deviations were used in the study and therefore, the results were presented via tables, figures and graphs. Whereas Pearson correlation was used to measure linear relation between

independent (BPR) and dependent variables (academic performance). In addition, multiple regression analysis was used to predict the value of academic performance. Two sets of scaled items were compared using the Cronbach Alpha reliability coefficient. The findings revealed correlation values greater than acceptable threshold of r= 0.05, with 0.798 and 0.816. The Cronbach Alpha values were greater than 0.7 affirming an acceptable level of internal consistency. The survey results, which are integral to understanding the contribution of Business Process Re-engineering to achieve academic performance and the relationship between the independent and dependent variables, yielded multifaceted perspectives

ANALYSIS AND DISCUSSIONS

The research was conducted with a total of 101 respondents, comprising 46 Registrars and 55 Directors of Quality Assurance from higher education institutions in the city of Kinshasa. Questionnaires were distributed to all 114 participants. Out of these, 101 were completed and returned, while 10 were incompletely filled, and three questionnaires were never returned. The overall response rate was calculated at 89. %, which significantly exceeds the typically recommended response rate for surveys, set at 30% (Baruch & Holtom, 2021; Baruch, 1999). This high response rate, surpassing two-thirds of the total sample, is instrumental in mitigating potential nonresponse bias and bolstering the validity and reliability of the survey findings (Saldivar, 2012; Fincham, 2008). As a result, the study findings can be confidently considered reliable and valid with respect to the research questions. They serve as a valuable reference point for the Government, Ministry of Higher Education, policymakers and higher education institutions.

$$RRR = \frac{Total\ number\ of\ responce}{Sample\ Size} \times 100$$

$\frac{101}{114}$×100 =Ans=89%

Quality influence academic performance of higher education institutions

Factor Analysis

Table 1: Factor Analysis correlation Matrix

		1	2	3	4	5	6	7	8	9
Correlation	1	1.000	.749	.700	.563	.222	.274	.097	.397	.486
	2	.749	1.000	.739	.554	.197	.282	.235	.454	.490
	3	.700	.739	1.000	.596	.237	.236	.227	.507	.550
	4	.563	.554	.596	1.000	.486	.365	.193	.415	.439

	5	.222	.197	.237	.486	1.000	.445	.035	.412	.464
	6	.274	.282	.236	.365	.445	1.000	-.017	.442	.393
	7	.097	.235	.227	.193	.035	-.017	1.000	.303	.089
	8	.397	.454	.507	.415	.412	.442	.303	1.000	.525
	9	.486	.490	.550	.439	.464	.393	.089	.525	1.000
Sig. (1-tailed)	1		.000	.000	.000	.016	.004	.177	.000	.000
	2	.000		.000	.000	.028	.003	.011	.000	.000
	3	.000	.000		.000	.011	.011	.014	.000	.000
	4	.000	.000	.000		.000	.000	.031	.000	.000
	5	.016	.028	.011	.000		.000	.370	.000	.000
	6	.004	.003	.011	.000	.000		.437	.000	.000
	7	.177	.011	.014	.031	.370	.437		.002	.197
	8	.000	.000	.000	.000	.000	.000	.002		.000
	9	.000	.000	.000	.000	.000	.000	.197	.000	

a. Determinant = .016

Table 1…

The correlation matrix provides valuable insights into the relationships among various factors impacting academic performance within an educational institution. The correlation coefficients range from -1 to 1, where positive values denote positive correlations, and negative values indicate negative correlations. The strength of these relationships increases as the absolute value of the coefficient approaches 1. A detailed examination reveals that Physical Facilities and Access (Factor 1) show strong positive correlations with aspects of academic performance. For instance, modern equipment (0.749), infrastructure (0.700), and curriculum quality (0.397) are highly correlated with physical facilities, indicating that well-equipped and accessible facilities are closely tied to better academic performance. Similarly, Modern Equipment and Access (Factor 2) also demonstrate positive correlations with other factors. Notably, facilities, modern equipment, and access are positively associated with infrastructure (0.739), visually appealing institutional environments (0.554), and curriculum quality (0.454). This highlights the importance of modern equipment in promoting enhanced academic outcomes, as supported by Gudo et al. (2011) and Yangambi (2023). An analysis of Adherence to Course Objectives, Policies, etc. (Factor 5) shows a positive correlation with both academic staff expertise (0.445) and curriculum quality (0.412). This suggests that strict adherence to academic guidelines enhances staff expertise and curriculum quality, aligning with Kremcheeva and Kremcheev's (2019) findings on the impact of these factors on educational quality. Academic Staff Expertise (Factor 6) correlates positively with curriculum quality (0.442) and personal interaction (0.303), indicating that knowledgeable staff contribute to higher curriculum

quality and better interactions with students. Financial aspects and exam fairness (Factor 9) also show positive correlations with infrastructure (0.550) and curriculum quality (0.525). This suggests that financial support and fair examinations positively impact infrastructure and curriculum quality, supporting Tani et al. (2019) on the influence of financial factors on student performance. Most correlations are statistically significant with p-values less than 0.001, indicating that these relationships are unlikely to be due to chance. The correlation matrix's Determinant of 0.016 indicates that the variables are not strongly linearly dependent, thus avoiding multicollinearity issues. Overall, the positive correlations among infrastructure, equipment, academic staff expertise, adherence to guidelines, and curriculum quality suggest that investments in these areas can significantly improve academic performance. However, Personal Interaction shows weaker correlations, suggesting it may be affected by other factors not included in this analysis. The positive links between financial support, exam fairness, and academic performance further underscore the importance of these factors in enhancing educational outcomes.

Table 2: KMO and Bartlett's Test For Quality

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.838
Bartlett's Test of Sphericity	Approx. Chi-Square	371.077
	df	36
	Sig.	.000

The KMO statistic falls within the range of 0 to 1, where higher values suggest greater appropriateness for factor analysis. For the present analysis, the KMO value achieved is 0.838. A KMO value higher than 0.7 is generally considered to be highly satisfactory, indicating that the dataset contains a significant amount of shared variance, thus making it suitable for factor analysis (Hair, Black, Babin, & Anderson, 2019). This implies that the data has shared patterns among variables, which can potentially be explained by underlying factors. Bartlett's Test of Sphericity is a crucial statistical test utilized in factor analysis to determine the correlation among the observed variables in the dataset. The test specifically examines the null hypothesis that the correlation matrix of the variables is an identity matrix, suggesting the absence of any correlations between the variables. In the present analysis, Bartlett's Test generated an estimated chi-square value of 371.077, with 36 degrees of freedom and a significance level (Sig.) of 0.000. A low p-value in Bartlett's Test (typically below 0.05) indicates that the variables in the dataset are significantly correlated (Field, 2013). This significant result supports the idea that the variables are not independent, and they exhibit substantial correlations. The KMO

measure and Bartlett's Test of Sphericity are both essential tools for assessing the appropriateness of the dataset for factor analysis. The dataset's KMO value of 0.838 exceeds the recommended threshold of 0.7, indicating a significant amount of shared variance and suitability for factor analysis (Hair et al., 2019). This shared variance indicates that there are underlying patterns or dimensions within the data. Additionally, the Bartlett's Test of Sphericity produced a remarkably significant outcome (Sig. = 0.000), affirming the presence of meaningful correlations among the variables in the dataset, indicating their non-independence (Field, 2013). It is essential to factor analysis that there exist connections between the observed variables which can be attributed to underlying factors.

Table 3: Total Variance explained with regards to quality

Component	**Initial Eigenvalues**	**Extraction Sums of Squared Loadings**	**Rotation Sums of Squared Loadingsa**
	Total	% of Variance	Cumulative %
1	4.275	47.500	47.500
2	1.290	14.350	61.850
3	1.000	11.120	72.970
4	0.650	7.220	80.190
5	0.590	6.460	86.650
6	0.410	4.470	91.120
7	0.330	3.640	94.760
8	0.260	2.850	97.610
9	0.230	2.470	100.000

Table 3 displays the results from a Principal Component Analysis (PCA) and provides insights into the variance explained by each component. The table shows the initial eigenvalues, which reflect the variance accounted for by each component before rotation, as well as the variance explained after extraction and rotation. The analysis highlights that Component 1 is the most significant, explaining 47.500% of the total variance. Component 2 follows with an explanation of 14.350% of the variance, and Component 3 explains 11.120%, together accounting for a substantial 72.970% of the total variance. The remaining components contribute progressively less to the overall variance, indicating that they have a limited impact on the dataset’s variability. These findings underscore the importance of focusing on the first three components for a comprehensive understanding of the dataset. The limited contribution of subsequent components suggests that they may not be as useful for further analysis.

Table 4: Component Matrix

Component	1	2	3
Your institution has adequate infrastructure that enhances academic performance of the students	0.824	0.023	0.072
Your institution has adequate and sufficient modern equipment and ease of access that enhances academic performance of the students	0.806	0.051	0.074
Your institution has adequate and sufficient physical facilities and ease of access that enhance academic performance of the students	0.782	0.034	0.101
Your institution has a visually appealing environment and support services	0.770	0.076	0.122
The financial burden relief, timeliness, fairness of examination, consistency, feedback from students, sequencing, training and placement, and delivery of knowledge at your institution help the students achieve academic performance	0.744	0.102	0.089
The courses/content/program has a relevant curriculum, effective use of computers, adequate coverage, and conceptual knowledge relevant to the industry and career needs of the students	0.719	0.155	0.331
Your institution prioritizes adherence to course objectives, clearly specified policies/guidelines, and firmly-enforced rules and regulations, enhancing students' academic performance	0.548	0.630	0.042
The academic staff at your institution possesses teaching expertise, practical knowledge, up-to-date knowledge, teaching methodology, and communication skills, contributing to students' academic performance	0.540	0.577	0.036
Personal interaction within our institution is founded on principles of camaraderie, empathy, compassion, fairness, and guidance to enhance students' academic achievements	0.273	0.401	0.841

Extraction Method Used: Principal Component Analysis.

a. 3 components extracted.

The data presented in the Component Matrix stems from a Principal Component Analysis (PCA) that evaluates factors related to academic performance and institutional quality within an educational setting. PCA is used to identify underlying patterns or

dimensions in data, and this analysis extracted three distinct components, each highlighting different aspects of institutional impact on academic outcomes. Component 1 focuses on the institutional environment and resources contributing to academic performance. It includes factors such as "Adequate infrastructure" (.824), "Modern equipment and ease of access" (.806), "Physical facilities and ease of access" (.782), and "Visually appealing environment and support services" (.770). These high positive loadings indicate a strong correlation among these variables, suggesting that well-resourced and supportive environments are crucial for enhancing academic performance. This finding aligns with previous research, which underscores the importance of institutional resources in achieving better student outcomes (Etshim, 2017; Halili et al., 2021; Handjila, 2017; Kremcheeva & Kremcheev, 2019; Teferra & Altbach, 2004; Yangambi, 2023).

Additionally, "Financial burden relief, timeliness, fairness of examination, consistency, feedback from students, sequencing, training and placement, and delivery of knowledge" (.744) also contributes positively, though to a lesser extent, to the first component. This suggests that these factors are somewhat influential in creating a conducive institutional environment. The factor "Adherence to course objectives, policies/guidelines, rules and regulations" (.548) is positively associated but shows a weaker impact compared to other elements in this component, indicating its role is less pronounced.

Component 2 is concerned with the quality of teaching and faculty expertise. Factors such as "Sufficient academic staff, teaching expertise and experience, practical knowledge, up-to-date knowledge, teaching methodology, and communication skills" (.577) have high positive loadings, emphasizing the significant role of faculty quality in influencing academic performance. Conversely, "Personal interaction within your institution" (.273) also loads positively but less so, suggesting its influence on academic performance is weaker in comparison to teaching quality.

Component 3 centers on personal interaction and support services. Here, "Personal interaction within your institution" (.841) has a notably strong positive loading, highlighting the importance of factors like camaraderie, empathy, and career counseling in fostering academic success. Interestingly, within this component, factors related to "Adequate infrastructure," "Modern equipment," and "Physical facilities" show negative loadings, indicating an inverse relationship with personal interaction. This suggests that institutions focusing heavily on personal interaction might have fewer resources dedicated to infrastructure and equipment.

Table 5: Diagnostic Test Results for Quality

Test	Statistic	p-value
Linearity	F(1, 98) = 39.87	0.000
Multicollinearity - VIF	1.42	-
Heteroscedasticity - Breusch-Pagan	chi2(1) = 2.11	0.146
Normality - Shapiro-Wilk	W = 0.976	0.062

The linearity test for quality with 9 statements shows a significant linear relationship (F(1, 98) = 39.87, p < 0.001). The multicollinearity test using VIF indicates no significant multicollinearity issues, with a VIF value of 1.42. The Breusch-Pagan test for heteroscedasticity reveals no significant heteroscedasticity (chi2 (1) = 2.11, p = 0.146). The Shapiro-Wilk test for normality suggests that the data follows a normal distribution (W = 0.976, p = 0.062).

Correlation between quality and Academic performance

Table 6: Correlation between quality and Academic performance

	Quality	Undergraduate grades	Enrolment	Masters' grades	Undergraduate completion 2020-2021	Posts graduates' students' completion 2020-2021
Quality						
Pearson Correlation	1	.543**	.482**	.643**	.550**	.527**
Sig. (2-tailed)		0.002	0.007	0.000	0.002	0.005
N	101	30	30	26	29	27
Undergraduate grades						
Pearson Correlation	.543**	1	.612**	.739**	.918**	.800**
Sig. (2-tailed)	0.002		0.000	0.000	0.000	0.000
N	30	30	30	26	29	27
Enrolment						
Pearson Correlation	.482**	.612**	1	.656**	.742**	.803**
Sig. (2-tailed)	0.007	0.000		0.000	0.000	0.000
N	30	30	30	26	29	27

Table 6…

Masters' grades						
Pearson Correlation	.643**	.739**	.656**	1	.846**	.867**
Sig. (2-tailed)	0.000	0.000	0.000		0.000	0.000
N	26	26	26	26	25	26
Undergraduate completion 2020-2021						
Pearson Correlation	.550**	.918**	.742**	.846**	1	.880**
Sig. (2-tailed)	0.002	0.000	0.000	0.000		0.000
N	29	29	29	25	29	26
Posts graduates' students completion 2020-2021						
Pearson Correlation	.527**	.800**	.803**	.867**	.880**	1
Sig. (2-tailed)	0.005	0.000	0.000	0.000	0.000	
N	27	27	27	26	26	27

The Pearson Correlation results indicate several significant relationships between the variables. Quality of education, as an independent variable, shows a moderate positive correlation with undergraduate grades (r = .543, p = 0.002), enrolment (r = .482, p = 0.007), master's grades (r = .643, p = 0.000), undergraduate completion for 2020-2021 (r = .550, p = 0.002), and postgraduates' students' completion for 2020-2021 (r = .527, p = 0.005). These significant correlations suggest that improvements in the quality of education are associated with better academic outcomes across these indicators. Specifically, the correlation between quality and undergraduate grades (r = .543, p = 0.002) indicates a strong positive relationship, meaning that higher quality in education is linked to higher undergraduate grades. Similarly, the relationship between quality and enrolment (r = .482, p = 0.007) signifies that improvements in quality also positively impact student enrolment rates. The correlation between quality and master's grades (r = .643, p = 0.000) is particularly strong, highlighting that quality enhancement efforts are strongly associated with better academic performance at the master's level. Additionally, the correlation between quality and undergraduate completion rates for 2020-2021

(r = .550, p = 0.002) demonstrates a significant positive relationship, indicating that higher quality is linked to higher completion rates among undergraduates. Furthermore, the relationship between quality and postgraduates' students' completion rates for 2020-2021 (r = .527, p = 0.005) also shows a significant positive correlation, suggesting that quality improvements positively influence the completion rates of postgraduate students. Overall, these results underscore the importance of quality enhancement efforts in education, as they are positively correlated with various indicators of academic performance, including grades, enrolment, and completion rates at both undergraduate and postgraduate levels. This finding aligns with the broader literature on the impact of quality management practices in higher education, emphasizing that such practices are crucial for institutional effectiveness and academic success. This outcome aligns with prior research, exemplified by a study conducted by Altbach and Salmi (2011), which posits that while quality management practices are undeniably integral to institutional effectiveness, their influence on specific academic outcomes may not manifest as direct and immediate. Instead, other contributing factors such as teaching quality, curriculum design, and student engagement could potentially play more prominent roles in determining academic performance. It is also essential to acknowledge the intricacy of the higher education environment. Factors influencing academic performance are multifaceted and interconnected, and the repercussions of quality enhancement initiatives may manifest indirectly over an extended period (Aized, 2012).

Testing Hypothesis

H_{01}: There is no relationship between quality and academic performance of higher education in Kinshasa, Democratic Republic of Congo.

Table 7: Testing Hypothesis between quality and academic performance

Model	R Square	Adjusted R Square	F-Statistic	p-Value	Coefficient (quality)	p-Value (Coeff.)
1	0.578	0.569	52.364	0.000	287.651	0.000

The analysis of the data yields a substantial R Square value of 0.578, signifying that 57.8% of the variability observed in academic performance can be elucidated by the quality variable. This denotes a robust association between the two factors. The positive Adjusted R Square (0.569) reinforces the adequacy of the model's fit to the data. Additionally, the F-Statistic stands at a significant 52.364, accompanied by a p-value of 0.000. This low p-value underscores the model's strong statistical significance, thereby implying that the quality variable,

meaningfully contributes to the explanation of variations in academic performance. The coefficient attributed to quality (DMAIC), quantified at 287.651, and illustrates a substantial positive linear correlation between quality (DMAIC) and academic performance. This coefficient's associated p-value of 0.000, notably below the customary significance threshold (e.g., 0.05), accentuates the statistically significant nature of the quality (DMAIC) variable in prognosticating academic performance.

The result aligns harmoniously with a segment of existing scholarly literature on the subject, which underscores that academic performance is influenced by a confluence of factors, including quality enhancement initiatives. The analysis supports the notion of a direct correlation between academic performances within this particular context. Notably, the perspectives presented by Bargerstock and Richards (2015), who postulate a contributory link between quality improvement and academic performance, are reinforced by these findings. In concurrence with both the statistical examination and a portion of pre-existing scholarship, the results advocate for the presence of a substantial relationship between quality and academic performance within the higher education institutions of Kinshasa, Democratic Republic of Congo. This challenges the null hypothesis, underscoring that quality enhancement emerge as significant predictors of academic performance within this specific milieu. Consequently, the accumulated evidence warrants the rejection of the null hypothesis, solidifying the notion that quality improvement measures have salience as predictors of academic performance within this delimited context. These findings suggest that initiatives for quality (DMAIC), not only contribute to overall institutional eminence but also have a direct and significant impact on academic performance. This underscores the importance of continued investment in quality improvement measures in higher education institutions to enhance academic performance.

SUMMARY OF FINDINGS

The return rate for the research instrument in this study was remarkably high, with 101 out of 114 distributed questionnaires satisfactorily completed and returned. This outcome translates to an overall response rate of 89%, significantly surpassing the established benchmark of 30% for online surveys. This elevated response rate serves a dual purpose: mitigating potential nonresponse bias and significantly enhancing the validity and reliability of the survey findings. Consequently, the study's findings can be ascribed a high degree of reliability and validity concerning the research inquiries (Baruch & Holtom, 2021; Baruch, 1999; Saldivar, 2012; Fincham, 2008). In terms of the gender distribution within the respondent sample of 101 individuals unveiled a marked gender asymmetry. Males constituted an overwhelming majority at 83.2%, with females accounting for a mere 16.8% of the sample. This

gender disproportion underscores the prevalence of males within institutions of higher learning, deviating significantly from an equitable gender representation. Depending on the research context, this gender disparity could potentially introduce bias, necessitating vigilant consideration when interpreting the findings. Regarding age distribution among the respondents, diverse trends emerged. The largest cohort, encompassing 48.5%, fell within the 41-50 age bracket, thereby highlighting the prominence of mid-career professionals. Additionally, a discernible representation of early to mid-career professionals (31-40 age group, 20.8%) and seasoned individuals aged 51 and above (24.8%) was evident. This multifaceted age diversity promises an array of perspectives and insights germane to the study's focal points encompassing Business Process Re-engineering and Academic Performance (Akinshipe et al., 2021; Alhamali, 2019).

The majority of participants (86.1%) held master's degrees, underscoring a highly educated cohort within the sphere of higher education institutions. Furthermore, 5% of the sample possessed doctoral or PhD qualifications, signifying the presence of exceptionally qualified individuals likely occupying pivotal positions within academia. This variegated educational landscape augments discussions and decision-making processes relevant to the study's scope. A noteworthy 54.5% of the participants were Directors of Quality Assurance, underscoring their pivotal role in supervising academic processes and standards. Registrars constituted the remaining 45.5%, playing an equally pivotal role in administrative functions within educational establishments. These roles assume the mantle of key stakeholders within this study, harmonizing with the emphasis on enhancing academic performance and academic processes (Researcher computation). The analysis of years of service unveiled a predilection for more recent employees (0-5 years and 6-10 years), with a diminishing trajectory as years of service increased. Notably, approximately 17.8% of respondents did not furnish this information. The presence of staff members with extensive service years alludes to institutional stability, while newer entrants introduce novel perspectives capable of influencing process augmentation and academic performance (Aital, Patil, & Behl, 2017; Etshim, 2017; Acquah, 2021).

CONCLUSION

The examination of the relationship between quality and academic performance in higher education institutions in Kinshasa provided in-depth insights into the influence of institutional quality factors. The descriptive analysis highlighted the importance of physical infrastructure, modern equipment, and facilities. Respondents rated the adequacy and sufficiency of physical facilities highly, with an average score of 4.12 out of 5. Infrastructure adequacy received an even higher score of 4.38, while modern equipment and access were

rated at 4.45. These findings underscore the critical role of well-maintained facilities and advanced equipment in enhancing academic performance. Factor analysis further supported the significance of quality-related variables. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.838, and Bartlett's Test of Sphericity was significant, indicating that the data was suitable for factor analysis. The total variance explained by the first three components was 72.94%, with the first component, which included physical infrastructure and equipment, explaining the largest portion of the variance. These components highlighted the essential elements of quality that contribute to academic performance, including adequate infrastructure, modern equipment, and supportive learning environments. Correlation and regression analyses revealed strong positive relationships between quality and academic performance indicators. The correlation matrix demonstrated significant positive correlations between physical facilities, modern equipment, and academic performance measures. Regression analysis confirmed these relationships, showing a high coefficient of determination ($R^2 = 0.614$) for the impact of quality on academic performance. The results indicated that improvements in infrastructure, equipment, and adherence to course objectives significantly enhance student outcomes. These findings suggest that a focus on maintaining high-quality facilities and providing modern educational resources is crucial for achieving better academic results in higher education institutions. The findings of the study are confirmed by the previous studies and total quality management theory. For instance, as noted by (Berg, 2011; Ülker, 2023; Yusuf, 2023), these researchers and among others have reached a consensus that the adoption of Total Quality Management (TQM) within higher education institutions has proven effective and has enhanced educational quality. The study carried out by Yusuf (2023) revealed that total quality management plays a crucial role in enhancing the quality of higher education in multiple countries. This conclusion is supported by the effect size calculated from 26 publications, which exhibit notable variability and an effect size value that is categorized as remarkably strong.

RECOMMENDATIONS FOR FURTHER STUDIES

Future research should delve into the non-academic factors influencing academic performance, such as motivation, creativity, and social integration, to provide a holistic understanding of student success. Comparative research should be conducted to discern differences and similarities among various types of educational institutions in Kinshasa, including privately-owned, publicly-funded, and religious-affiliated institutions. Such comparisons will provide valuable insights into the factors that differentially impact academic performance. Research should also investigate innovative pedagogical approaches that address the dynamic needs of contemporary students. This could include studies on the

effectiveness of technology integration, experiential learning, and project-based teaching methodologies. Finally, comprehensive evaluations of the policies and regulatory frameworks governing higher education in the DRC are warranted. These evaluations should assess the impact of these policies on academic performance and identify areas where policy modifications could enhance educational outcomes.

RECOMMENDATIONS FOR APPLICATION

The study recommends a sustained investment in improving the quality of infrastructure, equipment, and facilities within higher education institutions. Institutions should prioritize the maintenance and upgrade of physical infrastructure to create conducive learning environments. The acquisition and accessibility of modern educational equipment are also critical in supporting effective teaching and learning processes. By ensuring that students and faculty have access to the latest technology and resources, institutions can significantly enhance the quality of education and foster better academic outcomes.

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