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# Empirical Analysis on the Effect of Antecedents of the University of Nairobi's Academic Quality: Based on SEM Model

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# Abstract:

The empirical robustness affirmation of the effect of academic parameters on the academic quality of the University of Nairobi(UON) is what this study concerns. The study is as well integrated and dynamic in approach but based on a different set of primary data from that implied in previous related studies. It is regarding the key parameters under concern, and, specific objective is; -Implicating how (inter-)relational association and effects that key parameters of higher academia postulates on the academic quality of this university based on Empirical integration of primary data through assimilation of UON's Times Higher Education (THE)'s academic quality assessment through its variables and weights allocation in comparison to 'world class universities performance , usually perceived as homologous and divergent in structural actuation, and the justification of relevance of the integral scenario for academic benchmarking. Most importantly the study aims at explicating the influential impact, interrelations and correlational of key parameters of concern based on THE's integrated model (i.e., research, performance, teaching, attitude and internalization) on academic quality of UON while using deeply enshrined data generating structural dataset and models that are best known to capture well primary dataset underlining relations. This exercise is also in a bid to ascertain the relevant and key effects/impacts reported in the previous studies. The overall empirical errand is an extension of the objective of the study to generally address the temporal academic variances amid UON's academic transformation.

**Keywords:** Empirical analysis, integration, dataset, times higher education, the university of Nairobi, structural equation model, academic quality, Postulate

# 1. Descriptive Statistics of Dataset

The author started by describing the physical characteristics of the new dataset in a bid to understand their spatial underlying behavior. This is done by displaying the results in Table 1 with the characteristics of UON being presented in Table 1. Generally, this are the results which will be employed in the structural equation modelling to find the influence research, teaching, attitude, performance and internationalization has on academic quality. First, generally, across the Table 1, we see the main parameters of study, comprising of the construct parameters teaching, research, performance, internationalization and learner attitude with each of the constructs having been parameterized by the respective actual variables. Their respective means and standard deviation have also been presented.

Thus, based from the Table 1, we see that, and starting with the construct parameter teaching, it has been parameterized by the actual variables; university reputation, curriculum quality, student ration and teaching quality. Starting with teaching, we see that the reputation has mean value of 3.0, curriculum quality 1.3, student-teacher ratio 3.2 and teaching quality 4.0. A view of their means shows that the highest is by teaching quality and lowest by curriculum quality with the implication that the most stressed activity is teaching quality unlike curriculum quality in that order. Going by research construct, research reputation has the mean value 8.6, research reputation survey 2.4, conditional peer reviewed publication 4.1, research grant sufficiency 1.6, influenced research direction 2.4 while cited writing has the statistics 0.7. This implies that under research the research reputation is the most actualized parameter. Based on attitude the fact that the learner has an attitude towards the teaching staff and towards the curriculum is 4.3 and 3.2 respectively and for an implication that the attitude of the learners is significant. If it's for internationalization, we realize that the parameterization variables such as the reputation satisfaction (with mean 3.2), reputation influenced institution selection, alumni employability (with mean 4.1) and the ratio of domestic to international students (2.5) have the highest means compared to the Nobel prize aligned preference variable (mean value 1.4). If it regards performance, the participation in per capita activity variable (mean value 0.1) is the least activity while the research impact transformation (4.3) and the education quality (4.9) have the highest contribution of the mean activity. Based on the above parameter characteristic, an overview of these parameters shows them as relatively significant and important in describing the constructed variables important in demystifying relevant contribution of the constructs to represent the academic quality of the university of Nairobi.

Parameter	No. of Observations	Mean	Standard deviation	
	Teaching			
University Reputation	384	3.055	1.371	
Curriculum Quality	384	1.267	0.055	
Student-Teacher ratio	384	3.24	0.423	
Teaching Quality	384	4.007	0.349	
Research				
Research Reputation	384	8.571	3.542	
Research reputation survey	384	2.367	0.682	
Conditional peer reviewed publication	384	4.101	0.021	
Research grant sufficiency	384	1.63	0.434	
Influenced research direction	384	2.398	0.023	
Cited writing	384	0.74	0.235	
	Learner attitude			
Towards curriculum	384	3.212	0.207	
Towards teaching staff	384	4.309	0.724	
Internationalization				
Reputation satisfaction	384	3.195	1.247	
Reputation influenced institution selection	384	4.086	0.245	
Domestic: International student ratio	384	2.543	0.071	
Alumni Employability	384	4.088	0.109	
Winners (p-NPW)	384	1.345	0.799	
Performance				
Participation in Per	384	0.139	0.235	
capita enhancing				
activity				
Research impact transformation	384	4.282	0.124	
Education Quality	384	4.964	0.431	
Note: The minimum and maximum value are 1 and 5, respectively, using the Likert				
scale for all except conditional peer reviewed publication, learner attitude and				
Participation in Per capita enhancing activity that is binary based.				

Table 1: SEM— Descriptive: UON Academic Parameters

The parameters constructed still are as in Table 1, however with significantly different weights as for UON. To start with teaching, variables such as reputation (with mean 3.9), curriculum quality (with mean 2.3), student-teacher ratio (with mean 3.2) and teaching quality (with mean 4.0) are all indicating that they are significantly contributing to the constructed teaching parameter. Thus, its certain that the observed variables are significantly contributing to the teaching variables so that the teaching constructed variable may be further and significantly explicated. With regard to research, the variables with relatively greater contribution to the research construct includes research reputation (with mean 3.1), conditional peer reviewed publication (3.0), research reputation survey (3.1) and research grant sufficiency (3.2) while factors like influenced research direction with mean (1.1) and cited writing have mean values (0.3) with minimum weight contribution to the research. If it is about the learner attitude variable, the towards teaching staff one (with 3.9) and the towards curriculum one (2.3) have the reduced weights of contribution to the attitude. For internationalization, we note that the parameterization variables such as the reputation satisfaction (with mean 5.1), reputation influenced institution selection (3.1), alumni employability (with mean 4.1) and the ratio of domestic to international students (2.1) have the highest means compared to the Nobel prize aligned preference variable (mean value 3.5). If it regards performance, the participation in per capita activity variable (mean value 2.1) is the least activity while the research impact transformation (5.0) and the education quality (3.2) have the highest contribution of the mean activity. Based from the said parameter actualization, we have the surety that the specific variables parameterizing the constructs are significant towards postulating some important contributions to their respective variables.

Thus, with the sureties deduced from Table 1, we are certain that the constructed variables will be significant in demonstrating the underlying path causality and path of impact of variables: Teaching, research, performance, attitude and internationalization significantly cause changes in the academic quality of the respective two universities. An overview of the distribution statistic for both sets of data confirms for the normality in distribution and thus, there

applicability of the data. This does not deter from a further deep but structural enshrined analysis of the dataset to identify their underlying correlations and interconnections, and the general influence they have on academic quality. The author indicted the structural equation modelling to suitably explore the objectives of concern while, and succinctly addressing the dynamics of the data for appropriate variance demystification. The next subsection best pins this down.

# 2. Confirmatory Test and Path Causality Analysis

Both the confirmatory test and the path component analysis are key in identifying and explicating whether the underlying variable integration, and or direction of integration is likely not to be spurious. If spurious, then the data may be enshrining an assortment of anomalies for which any further analysis may be inept and irrelevant.

#### 2.1. Confirmatory Test Analysis

In this line, the structural analysis of the SEM algorithm is initiated from the diagnostics tests of the path causalities. Specifically, the next table best present the path analysis postulations.

Parameter	Cronbach Statistic	Factor Loading	Z-statistic	
Teaching	0.760(0.711)			
University Reputation		0.218*	1.90	
Curriculum Quality		0.191*	2.35	
Student-Teacher ratio		0.381	0.19	
Teaching Quality		0.582***	-34.8	
Research	0.801(0.839)			
Research Reputation		0.498***	4.06	
Research reputation survey		0.424*	2.92	
Conditional peer reviewed publication		0.418***	3.02	
research grant sufficiency		-0.182	-2.01	
Influenced research direction		0.585***	17.93	
Cited writing		-0.243***	-5.65	
Research Reputation		0.522***	21.2	
Learner Attitude	0.656(0.673			
Towards curriculum		-0.914***	-59.9	
Towards teaching staff		0.004*	3.51	
I1	nternationalization 0	.704(0.986)		
Reputation satisfaction				
Reputation influenced		0.118***	3.22	
institution selection				
Domestic: International		0.091*	2.34	
student ratio			0.40	
Alumni Employability		0.388***	8.19	
Preference: Nobel prize		0.682***	-27.8	
Winners (p-NPW)	0.020(0.002)			
Performance	0.920(0.893)		45.00	
Participation in Per capita		0.552***	17.93	
ennancing activity		0 5 4 2 * *	2.00	
transformation		-0.543	-3.89	
Education Quality		0.852***	21 20	
$IP$ Chi square statistic – $402.2^{\circ}$	1***• DMSEA-0 000• CEI-0 8	97. SPMP-0.089. The statist	ics brackotod	
are respective variable constructs reliabilities (CR) while rest of the statistics displayed on the path				
diagram are coefficients. The *. **. and *** are the 10.5 and 1 % statistical significance respectively LR is				
the likelihood ratio. RMSEA, the root mean square error of approximation, and CFI the comparative fit				
			r · · · · · · · · · · · · · · · · · · ·	

index.

Table 2: Confirmatory Test Analysis: UON Data Set

Therefore, according to Table 2, we have the confirmatory test analysis findings for UON data set. The first column represents the parameters, the second the Cronbach statistics, factor loading and lastly the Z-statistics. Based on the factor loadings of the observed parameters, we notice that university reputation, curriculum quality and the teaching quality all have significant coefficients at a degree of statistical significance. This, creates the implication that the three variables sufficiently and may individually be used in representing the constructed variable (teaching) except the student-teacher ratio which may only be important if integrated in the rest of the variables. With research construct, we see that all of the variables are significant except for the research grant sufficiency which is also negative for the implication that the

variable sufficiently signposts research parameter. With the learner attitude, that of towards curriculum and towards teaching staff are also significant to cause better the learners' attitude. When it regards internationalization, we can also read a number of significant effects. Most of the variables (reputation satisfaction, reputation influenced institution selection, domestic: International student ratio, alumni employability and preference to Nobel prize Winners) are largely significant and with important weights to impact the constructed internationalization. For performance, we notice that the

Participation in Per capita enhancing activity, Research impact transformation and the Education Quality, also are important in demystifying the performance construct.

The statistic discussed in the factor loadings show that there exist some relevant weights of the respective parameters to designate the latent variable. In this line, we observe that most of the latency have significant Cronbach coefficient; that is, teaching (at 0.76), research (at 0.80), learner attitude (at 0.66), internationalization (at 0.70) and performance (at 0.92) respectively. However, this will be significant when their diagnostics are proper. A view of their diagnostics in the lower part of the table seems to be promising as to the relevant of the Cronbach statistics and the general parameterization. First, the LR statistics (492.1) is significant at 1% for the notation that the model is statistically significant, and the evidence supported by the significant RMSE coefficient. Additionally, the high CFI index is good for recommending the results; over 88% of the variation in the model is explained by the model. The SRMR is also good for the general implication the model is representative.

#### 2.2. Path-Causality Analysis

Having confirmed the suitability of the data that it is fit for the structural modeling, we delved into some deep insights regarding the data generating process and started by investigating the likely significance of the underlying path of causality. This outcome of the SEM is graphed in Figure 1.



Figure 1: Path Analysis (Baseline Parameters): UON Academic Parameters

Thus, according to Figure 1, causality path for the relationship amid the observed and latent parameters has been implicated. We observe relevant and significant pathways of causality from both the observed to the latent and from the latency to academic quality.

Based on Figure 1, the path analysis or UON has been presented. The analysis initiates with teaching clockwise. We insight that, most of the variables depicting its latency are significant based on their statistics that is relevant at the accepted levels of statistical significance. Some of significant estimates are teaching quality (at 10% significance), curriculum quality (at 5% significance) and university reputation (at 10% significance) except for the student-teacher ratio with weakly coefficient of 0.007. The implication created is that student-teacher ratio isn't sufficient in singly designating for teaching but its effectively heighted when integrated with the curriculum quality, university reputation and teacher quality. Performance, which is parameterized by participation in per capita enhancing activities, research impact transformation and education quality has the former and latter variables significant except for research reputation. Based on this, the analogy behind implicates the fact that if the variables are combined, they would postulate an appropriate

causal path which may importantly designate the performance variable. With learner attitude, the two respective parameters; for towards curriculum and the for towards teaching staff have the statistics; 0.8 and 0.7 portraying mixed significance, that, in the midst of their integration, these would postulate relevant causality to the latently developed learner attitude component of academic quality. Another important component of the academic quality is the internationalization parameter signposted by reputation survey, reputation influenced institution selection, ration of domestic to international students, alumni employability and the preference variable for Noble prize winners. However, the significant ones based on their statistics coefficient are; alumni employability and the reputation influenced institution selection. That, however, when integrated with the rest of the variables, they best depict the path of causality to internationalization. Rounding up with research, we notice that the latency is developed from; cited writing, influenced research direction, research grant sufficiency, research reputation, conditional peer reviewed publication, research policy practicability, and the research reputation survey.

In line to the above discussion, we delved a bit into their latency, and their effects to the dependent variable, the academic quality of the higher institution and which is signposted by the latent; teaching, research, attitude, performance and internationalization components. Going by their coefficients, we are certain of their important representation on the academic quality of the university of Nairobi. Almost all of them have the needed significance except for the variable depicting the learner attitude component. The general insight presented depict that the five variables best depict the academic quality of the university of the Nairobi. With this notation, we are confident that the path identified relevantly portrays the causal direction of the observed and the latent variable to academic quality of higher institutions.

A general overview of the depictions of Figure 1 overly converges to Figures which IS demonstrating the parameters of the baseline model for UON. Insights of the parameters has noted it to be significant in latency modelling of teaching, performance, attitude, internationalization and research which have been noted to be important in affecting the academic quality the higher institutions. It is key to note that these are the variables which would be implied for baseline modeling. However, we also delve the path analysis of other set of data to be implored when the effect of new variables research policy practicability and ranking reputation/reliability is implicated into the baseline models. The data set is graphed in Figure 1. That of UONhas been presented in figure 2.



Figure 2: Path Analysis (Research Policy Practicability & Ranking Reputation/Quality - Modified Parameters): UON Academic Parameters

Therefore, in reference of figure 2, we find significant postulations, insights and representations by the latent variables; Teaching, performance, attitude, internationalization and research. If we start with performance; we notice that variables like the participation in per capita enhancing activity and research impact transformation seems insignificant but it is expected that, when they are integrated with education quality, they would best trace the path of causing performance. Their insignificance may be the one accounting for the weak significance of the latently developed variable (performance with an impact coefficient of 1.45) whose whole impact relevance has less weight. Insights of the learner attitude component is also revealing that the most relevant kind of attitude is that towards the teaching staff, and this

should be impacting the academic ranking in same weight. Even, the 0.345 coefficient of learner attitude latency towards academic quality of UON is in fact weakly significant. The most unpromising effect is when the internationalization is put into consideration. This is where the ranking reliability /quality variable is integrated in the latency. It's composed of an assortment of observed factors with the most statistically significant as; ranking reliability /quality, alumni employability and the ratio of domestic-international students. However, the authors discretion is that, if the variables are integrated together with reputation satisfaction and reputation influenced institution selection, the overall impact is deemed critical in causing the academic quality for UON. This is discredited by the highly insignificant coefficient (-0.58) that is implying for what would have been poor interrelations of the latent variable. The most interesting insights are when the research variable is considered. The latency is provided by cited writing, influenced research direction, research grant sufficiency, research reputation, conditional peer reviewed publication, and research reputation survey and the preference for the Nobel prize winners. Relevant path of causality is depicted by influenced research direction, conditional peer reviewed publication, and the preference for the Nobel prize winners. The integrated impact is on their hand strongly significant with the implication for the much weight of research done to academic quality by the research weight. On teaching, we still infer significant path of causal effects, especially when variables like university reputation, curriculum quality and the student-teacher ratio. The direction laid by the path causalities imply that there underlie significant causal effects of the observed variables to either teaching, research, learner attitude, internationalization or performance latency as far as the UON academic quality is put at hand. The author also discusses the modelled dataset of the UIS to bring reader at grip of the different kinds of dataset from the baseline set of data. The next figure depicts to this.

# 3. SEM Coefficient Modelling: Impact and Effect of Key Academic Parameters on UON Academic Quality

The underlying sub-hypothesis to be diagnosed is stated as; -

There underlies certain significant impacts and effects that key parameters of higher academia postulates to the academic quality of UON, and which also is significantly homologous and divergent in structural actuation.

Here, an assortment of structural coefficients is estimated using the baseline dataset, and the deviation set. Key role of baseline results depicts the alignment of the data generating process while the deviation coefficients are for affirming the robustness and certainty of the underlying impact, and in a bid to authenticate the effects/impacts of the variances under study towards academic quality. The analysis initiates with the baseline modelling of UON.

# 4. Baseline Modelling of the Structural Coefficients of the UON

The baseline coefficients are estimated from the baseline path causality in Figure 2 for which the baseline parameters for UONare in 2. The analysis hence commences with the estimates representing the estimate coefficients of how the variance parameters affect academic quality of UON.



Figure 3: Coefficient – Parameter Estimation: UON Baseline Model

Therefore, basing on the figure 3, we read that the observed parameters have been converted into their latent variables that in previous chapters constitute the academic variance parameters. The variances have been diagnosed and found to be appropriately signposting the observed parameters. Their associated parameter coefficients are also attached. In this line, as the baseline model, we read some relevant impacts in regard to the parameters; performance, attitude,

research, internationalization and teaching towards academic quality. The coefficient of learner attitude is -0.876 and that of performance is 0.842. Despite both of them being insignificant, the former is negative for an implication that there underlies some diminishing effect that learner attitude has on academic quality, as performance impact is disguising from the expected. The effect of teaching depicted by the significant coefficient 0.22 shows that teaching has an increasing impact on the quality of academics for UON. Internationalization is also significant for the implied notation that it positively affects academic quality. The 10% significance of the coefficient demonstrate that in UONs' academic circle, the effect of internationalization and performance are relatively increasing the education quality. The increasingly interesting finding is done by the research coefficient which is at 0.784 and significant at 1% for the implication that research is the most practical activity boosting well the education quality. We preserve this realization and focus on the estimates for UON that is discussed while keeping in mind the demystification of the variances gap. These estimates are enshrined in the figure above

#### 5. Modified Modelling of the Structural Coefficients of the UON

The modification is due when new observed parameters are introduced in the model. That is, research policy practicability on research latency, and ranking reputation reliability on internationalization latency. Figure 4 concerns UON deviant coefficient estimations with the estimation done while considering versions of baseline modelling.

The author initiates from the estimates of deviation from the underling model for UON. This is Figure 4, and by which we see that the impacts by teaching, performance, internationalization, attitude and research towards academic quality of UON are presented. The coefficients are that; teaching is 2.34, performance is 4.09 and internationalization 0.059 are significant for an underling relevant impact but with low certainty. In case of learner attitude, the coefficient is - 0.68 and significant at 5% for the implication of relatively larger disharmonies impact attitude has on academic quality. Regarding research, we notice that the 1.49 coefficient is strongly significant with the implication of strong impact on education quality.



Figure 4: Coefficient- Parameter Estimation: UON (Modified) Model

# 6. Mediation Modelling; Structural Coefficients Estimates and Robustness Analysis

In the academic circle of the parameters; teaching, research, internationalization, performance and attitude variances, there exist some underlying relationship linking parameter over which the mediation effect is key in controlling the impact. This effect is implicated using teaching and performances in mediating the effect of research and attitude respectively. Such mediation effects have been actuated and presented in Figure 5, and done for UON

# 6.1. Results When Teaching Is the Mediator

This is reflecting the graphical estimations in Figure 5 where it is enshrining results for UON



Figure 5: Parameter Estimation: UON (Mediation) Modelling

A surface view of the figure shows that performance, learner attitude, internationalization and research to some point as seemingly rolling up the direct effects on academic quality while teaching is mediating the impact of research on the quality of academics. The effect by research is on the other hand mediated by teaching based on the outfit that objective specific guided research in matters of academics and its structural improvement policy frameworks, best works to alleviate the quality of education. Therefore, the main role of these (graphical) models (and as enshrined in Figures 8) was to capture the dynamic related effects of the mediator in integrating resulting effect of the mediation process. Specifically, with the estimates of Figure 8, we notice based on the mediator environment that, (i) the coefficient of the research on teaching is 2.5 and significant for the implication that research betters the teaching and allied activities (ii) the direct effect to academic quality is observed, we find that teaching best integrates the research activity (see the coefficient 4.24 is statistically significant) for the implied importance of imploring research to teaching as the whole effect is integrative important. The most key note on a general view depicts the fact that if teaching is integrated in the teaching department and activities, the quality of teaching is in fact improved as the general effect is overwhelmingly admirable for the side of UON.

# 7. Results When Teaching and Performance Mediates

Since previous estimations and in both universities, teaching has been depicted as seemingly amongst the best outfit for alleviating the education quality. Similarly, performance as relevant academic quality literature puts out, it's inevitable to separate it with teaching as the two academic variances go hand in hand. They complement each other and so does with research. It's based on this effect that we desired to find out how if teaching in addition to performance acting as mediators' impact academic quality. The teaching parameter is therefore mediating research as performance is mediating the learner attitude. The psychomotor literature has large evidence supporting that attitude of the learner changes the way s/he views and acts on performance Figure 6 has the estimations needing analysis but with the figure below postulating the effects for UON respectively.



Figure 6: Parameter Estimation: UON (Mediation II) Modelling

Therefore, Figure 6 enshrining parameter estimation for UON model implicated the two mediators: Teaching and performance in order to measure appropriately between the direct and indirect effects of performance, teaching, learner attitude, research and internationalization on the academic quality of UON. Starting with the direct effects; we have internationalization (with coefficient -1.5) for the impact that an increasing effort by internationalization to change the quality of academics culminates to declining the gains of academic quality for UON. When research and learner attitude are considered, the seemingly direct effects are all positive. For the notation that research and learner attitude does increases the academic quality of UON. Checking impact via the path of mediator, we find that learner attitude on performance is -0.5 and insignificant while that of research on teaching is 0.6 – weakly but significant. However, when the impact is mediated, the mediation effect forwards significant impact. To academic quality. That is, learner attitude to academic quality via performance has the coefficient (0.93, significant) while research to academic quality when acting as mediating.



Figure 7: Parameter Estimation: UON (Paired Moderation Effect) Model

From the Figure (7), there underlies some significant relation based on the coefficient depicted in the structural coefficient. We notice the parameters of performance, attitude, teaching, research and internationalization portraying relevant impacts on the academic quality. However, the effect observed expects to imply the reflections on the paired relations; performance-learner attitude and the pair teaching-research in the presence of the direct effect of internationalization. The relevant impacts depict that the moderation in the paired relation amid the performance-learner attitude has the coefficient 0.6 which is significant and positively changing the academic quality. Similar moderation effect produced amid the teaching-research portrays same increasing and significant effect on the quality of academics. The picture portrayed is that the pairing is inevitable for an improving quality of academics in UON.

#### 8. Discussion of Results

This is particularly the case with respect to international ranking systems, which have a restricted range of possible indicators due to the lack of adequate comparative data. On the other hand, international ranking schemes are taking on a quality assurance role in the growing international student market, this suggests that the global higher education community needs to begin to look at how best to collect and report data on institutions so as to permit thoughtful and responsible inter-institutional comparisons based on transparency and clear accountability to the faith entrusted them by all stakeholders and this finding is mostly reported in literature (Hauptman Komotar, 2019; Johnes, 2018; X. Li &Thige, 2017; Nafukho et al., 2019; Alghamdi., Haider & Sadiq, 2019; Allen, 2019; Al Jaber & Elayyan, 2020).

"Ranking systems are a growing phenomenon in higher education around the globe", the offer is considerably diminished when a strict selection of international ranking of multidisciplinary conducted. Specifically, results obtained in this study are four international university ranking systems selected. The four ranking systems had both convergent and divergent approaches in their production, structure, indicators and weights. This finding is has also been reported widely in other studies such as (Aghayi, 2018; Ahmed, 2015; Altbach et al., 2019; Johnes, 2018; Muñoz-Suárez et al., 2020; Safón, 2013; Safon, 2019).

When the researcher tried to cover all the content within the ranking Indicators, weights and diversification in order to find a correlation in the Ranking Systems and come up with a ranking table based on similar indicators, he found wide disparities and therefore chose to list each ranking system independently (Table 1) Ranking alters traditional academic positioning of which combine Higher Education Institutions Development based on the ranking's concept and data. Other controversial aspects of ranking systems are referred to its structure (i.e., numerical or clustering approach).

Every selected ranking listed rank the university according to a numerical approach. The main criticism to this structure was that the differences among closely ranked universities can be due to statistical artifacts rather than true differences. However, solution adopted by benchmarking UON against THE world Ranking is not free of methodological difficulties, since the apparent distinction between UON and top performing 'World class universities' is vast. A possible solution is to use numerical rankings, but provide the consumer with easily understood information about the extent to which apparent differences in rankings reflect true statistical differences. Further research on this area is needed.

Other aspects subject to debate in specialized ranking literature is the arbitrariness in assigning weights to the various indicators included in the ranking. Data from present study confirm variability on this feature. The indicators referred in QS and THE portray many similarities and this might be explained by the initial working relationship between the two which initially worked as one before splitting into the two current systems both in the United Kingdom. The difficulty is how to report results without assigning weights, since the various scores on different indicators cannot then combine into any single score that reflects overall quality of a given institution.

The study observed that it is possible to rank universities separately on each indicator, although this option overcomes the assignment of weights to the various measures included in the ranking. It is quite clear that a system that offers so many aspects of university performance, may not be handy for students looking for information to decide on which is the best university. This individualized ranking approach seems more appropriate for the purposes of staff members, institutions and government. Other alternatives suggested by this study are, to survey experts regarding what weights to apply to the different measures. Evaluating and surveying HEIs' quality and reputation are highly useful as well to know their opinions concerning the weighting to assign to indicators for international comparative evaluations. Similar studies with this finding includes (Astin, 2012; Fayolle& Redford, 2014; Han & Xu, 2019; Jöns&Hoyler, 2013;Khamala., Makori & Njiraine2018; Mukhwana et al., 2016; Muñoz-Suárez et al., 2020;Fernández & Castillo, 2021).

Thus, research approach by the study has been all-inclusive ranging from the descriptive statistics for knowing the variables physical espousement and distribution in the population. Here, two sets of data have been described but all circumnavigating the virtual academic quality parameters of UON for which have been assembled from the observed parameters using an online questionnaire. Their most relevant measures of distribution and central tendency has been presented which generally postulates that the data set 1 and 2 are normally distributed and as reliability statistic on the other hand portraying acceptance of the null hypothesis for significant Cronbanch alpha weight as in studies of (Lin et al., 2012; Mukhwana et al., 2016; Muñoz-Suárez et al., 2020), and depicting that the data is reliable for subsequent analysis. Both the confirmatory test and the path component analysis are key in identifying and explicating whether the underlying variable integration, and or direction of integration is likely not to be spurious. If spurious, then the data may be enshrining an assortment of anomalies for which any further analysis may be inept and irrelevant. However, confirmatory test analysis confirms that there exist some significant and underlying causal paths. This implies that the path/and or direction along which teaching, research, performance, learner attitude and internationalization are relevantly significant for the implication that the academic quality is definite and non-virtual with some inter-correlation inducing causalities as in studies of (Cheng, Wang, & Liu, 2014; Mukhwana et al., 2016; Nafukho et al., 2019; Ng'ethe, 2014;X. Li & Thige, 2017; Muiruri, 2017; Pandiella et al 2018; Perianes, & Ruiz 2018; Chang& Ouyang2018; Welsh., 2018; Noreen& Hussain,

2019; Chea., Tan& Huan2019; Nasirzadeh et al 2021;Nassa& Arora, 2021; Ndofirepi., Farinloye& Mogaji, 2020;Pitman et al 2020; Caeiro et al, 2020; Shahjahan et al , 2020; Henry et al 2020; Dowling., 2020; Kiraka, et al 2020; Okanović et al, 2021; Altakhaineh& Zibin2021; Zhang et al 2021; Calitz., Camilleri, 2021a; Cullen., & Kanyutu 2021; Feyen,2021; Shahjahan& Edwards2021).

With the confirmation of normality of the data, and having realized its best fitting from a further deep but structural enshrined analysis of the dataset to identify their underlying correlations and interconnections, and the general influence they have on academic quality. The author indicted the structural equation modelling to suitably explore the objectives of concern while, and succinctly addressing the dynamics of the data for appropriate variance demystification.

Further analysis was based on the demands of the objectives. For instance, the data set 1 which was implicated using ordinal regression, independent T-test, and the Variance analysis was of the aim to satisfy the demands of the third objective. The quest for analogous contrasting of the variances of UON to identify the gap resulted in analyzing the variances and subsequently their behavior in their correlation matrix. The fourth objective is integrated in checking the impact, effects of the parameter variances on the academic quality of UON.

From the above, the confirmatory test analysis, we confirm that there exist some significant and underlying causal paths. This implies that the path/and or direction along which teaching, research, performance, learner attitude and internationalization are relevantly significant for the implication that the academic quality is definite and non-virtual with some inter-correlation inducing causalities

# 9. Conclusion

Based on this analysis, there exist some significant and underlying causal paths. This implies that the path/and or direction along which teaching, research, performance, learner attitude and internationalization are relevantly significant for the implication that the academic quality is definite and non-virtual with some inter-correlation inducing causalities. Teaching, research, performance, attitude and internationalization significantly cause changes in the academic quality of the respective of UON; (ii) Research, teaching and learner attitude are the big three parameters whose changes are key in disorientating the stability of academic quality in UON; (iii) teaching (performance) best mediates effects of research(learner attitude) for the outfit that objective specific guided research in matters of academics and its structural improvement policy frameworks, and appropriate teaching-learning policies/backdrops, best works to alleviate the quality of education in the university; (iv) Mediation to extent moderates the incoming effect and induces a change of magnitude or of direction or both on outgoing effects so that the moderation/mediation effect best demystify that academic quality is best activated when there is integration. Mostly, the mediator is integrated and found mostly positively changing the academic quality; (v) the results of the structural coefficients and estimations postulating varied impacts on the academic quality are robust and consistent under baseline, deviant and paired-integrative modelling, poising their usefulness in policy conclusion.

The above realizations confirm to the achievement of the 4<sup>th</sup> objective which sought to find out the association and effects that key parameters of higher academia postulates to the academic quality in UON usually perceived as homologous and divergent in structural actuation, and the justification of relevance of the integral scenario for academic collaboration.

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