

EMPOWERING THE SAUDI'S HIGHER EDUCATION SYSTEM: REAL STRATEGIES TOWARDS A WORLD-CLASS STATUS

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Paper Received: 03.11.2022 / **Paper Accepted:** 23.11.2022 / **Paper Published:** 03.12.2022

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Abstract

Motivated by the higher education transformation strategy proposed in the vision 2030 of Saudi Arabia to supporting at least five Saudi institutions break into the top - 200 ranking list worldwide. A nationwide survey data obtained from faculty with good knowledge and experience on the subject of interest, was used to examine how these institutions have taken on this challenge. A theorized baseline model is specified that yields all other alternative models of interest as special cases. Generalized ordered Logit estimation is adopted for all models, and specification tests for model selection are based on AIC, BIC, RMSEA, and $\Delta(\chi^2)$. Study reveals that global engagement through active partnership was a real obstacle to world-class university status and might further undermine the commitments to the Sustainable Development Goals (SDGs) set by the United Nations. In addition, the marginal effect of the estimated communication and external research funding were both statistically negatives, creating confusions among stakeholders and uncertainty about the future of research outcomes.

Keywords: Survey, Specification Tests, Strategy, World-Class Universities, SDGs.

Introduction

Since 2003, several organizations have published world university rankings. The most influential from these organizations are Academic Ranking of World Universities [1] and Times Higher Education [32]. While the former focuses mainly on research the latter underweights research. Both rankings differ on the way they select the indicators, weights, data collection and analysis. Based on ARWU (2022 edition of the table) only two universities are among this list and three universities make the top 500. For THEs (2023 edition of the table), and out of 27 universities that are listed in this Table, only one university was among this list and five universities make the top 500.

However, SA has already made significant headway in achieving this strategy, and the window of opportunities for universities to lead the international ranking list is real and attainable given the remaining timeline and the government financial incentives. For example, and based on the General Authority for Statistics [10], in 2020 the government allocated SR193billion (\$51.5billion) to education, which represents 18.9% of the total government spending and 7.4% of total GDP. This latter is slightly above the Organization for Economic Co-operation and Development [21] average of 6.3%. In addition, the economy overall would flourish, energized by 2030 if SA adopts the full potential scenario proposed by McKinsey [20].

In a global context, and based on UNESCO [32], in 2020, governments invested approximately US \$11.8 trillion in stimulus packages. However, only 0.78 per cent or US \$91 billion is for education. Of those US \$91 billion, only US \$8.7 billion is in low- and lower-middle-income countries [34]. The education stimulus was used to offer immediate support during widespread school closures, preparation for the gradual reopening of schools and post-COVID learning recovery [34]. As for higher education, SA allocated a budget of SR135.5 billion for the 2021 year. The whole amount of this budget was allocated to expenses and no specific budget's share was mentioned regarding research activity.

In this view, the purpose of this study is to address the real path to empower the Saudi's higher education system, but at the same time, championing strategies towards a world-class status in the context of model specifications and if possible, any

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interaction effects among the exogenous variables that may arise. The paper begins with a brief review of past studies and the main variables that may impact this path. This is followed by research methodology based on a survey questionnaire from prominent - public and private universities. Specifically, a generalized ordered Logit [36] was used for all estimations. Several model specifications were developed in order to remove the exogenous variables that are theoretically irrelevant or by adding the missed exogenous variables that are theoretically relevant.

Throughout our analysis, we proposed testable hypothesis across the models in order to select the “correct” model that provides parameters estimates that are unbiased in term of signs and magnitudes and consistent with the theory as well. Then, the estimates of the model selected are used for discussions and their implications for policy decision process. Literature reviews have considered at length the analysis of model selection, and many textbooks contain a discussion of some or all of these issues. Finally, the conclusion highlights the main contributions in higher education field, study limitations and future research direction for a significant educational transformation that meets the strategy’s target.

The Path to world - class universities: scholars and institutional administrators define “world-class” as attaining the standard to be included in the Lists of World University Rankings, which focuses on quality of education, internationalization, research output, status, and impact [31]. A broader definition was given by Deeks [7] “a world-class university has world-class research performance as measured by conventional research statistics, an excellent international reputation, attracts world-class academics and students from around the world, has world-class facilities, and is funded at a level which is comparable with other world-class universities.”

The academic literature on global university rankings have faced a wide - range of critiques on different aspects [11; 12]; [28]; and [20]. But these critiques have little influences on policy making decisions because of their potential benefits [30]; [25]; and [20]. For example, OECD [21] reported a sponsored study of 2006 asking how higher education institutions (HEIs) are responding to rankings, and what impact or influence they are having, revealed that leaders from 202 HEIs in 41 countries believe rankings influence their decisions about accreditation, funding, sponsorship and employee recruitment.

However, governments use rankings as an additional tool to gauge their institutions competitiveness at international level and to learn more about the

strengths and weaknesses of their higher education system for future improvements and private funding agencies use these rankings for transparency of information and accountability and to best place their endowments and gain trust with their partners for future investments.

Rankings have also received a great attention in SA even before the inception of the Vision 2030 and its ambitions for the higher education sector. At national level for example, the student scholarships for international study are only admitted to top ranking universities [26]. The Ministry of Education (ME) has pledged its commitment to provide support to universities, with respect to strategic planning, as well as in providing any data and report studies. The ME has insisted also on the need of private sector support in the financing and construction of education infrastructure, creating new opportunities for foreign investors.

In a research context, there is no “golden” model to achieve a world-class university status because each country has its own culture and resources. Therefore, the appropriate model form cannot in general be specified on theoretical grounds [23]. For this study the following determinants of world-class status deemed important: transformational leadership [3] & [4]; [22]; [5]; [16], effective communication among all stakeholders [2]; [35]; [13]; [37], global engagement with community and beyond through effective partnerships and collaborations [24]; [8], real strategies for real impact that may include a very well-selected key performance indicators and a very-well selected set of peers for benchmarking, research funding from trusted funder agencies, and the university autonomy.

Research Methodology

Sample

The survey used for this study was restricted to faculty with good skills and knowledge on how to achieve world class status. Specifically, the study welcomed responses from those who have worked on quality assurance, accreditation, strategic planning, international ranking, and in related areas.

Around 500 faculty participated in this survey from June 2021 to September 2022. This includes 18 universities out of 22 universities that are listed by “THE” league Table (September 2022). At the time this article was written, a total of 286 responses were obtained from the survey with a response rate of 57.2%.

Only responses that were at least 50% completed were included in the final data set for analyses. Public universities represent 86.4% ($n_1 = 245$) while private universities represent 13.6% ($n_2 = 39$).

Riyadh region represents 6 (33.3%) universities out of the total. From the 18 universities selected 15 (83.3%) universities are publics and 3 (16.7%) are privates.

Participants were identified through their university websites. The survey contained 37 items, but not all of them were used in the analyses because they cover different topics. Respondents were informed about the research aims and their anonymity throughout the study, even to the researcher itself. All information gathered is kept confidential.

Dependent Variable

The dependent variable is a single measure and an ordered choice. Respondents were asked to rate on a 4-point scale (1 = *strongly disagree* to 4 = *strongly agree*) the following statement:

“The university aims to be among the top 200 universities worldwide by 2030 based on Times Higher Education (THE) rankings (United Kingdom).”

Independent Variables

Four variables are used in dimensions: strategy for impact (5 items), communication (5 items), global engagement (5 items), and T-Leadership (4 items). And respondents were asked to rate on a 4-point scale (1 = *strongly disagree* to 4 = *strongly agree*) the statement that define the items. Two variables are used as dummy variables: research funding (1 = research funding is enough to achieve a world class university and 0 = otherwise) and university autonomy (1 = if the university is autonomous and 0 = otherwise). These variables are summarized in Table 1 and are aligned with the THE's performance indicators.

Statistical analysis: IBM SPSS Statistics version 23 was used for data analysis. The internal reliability consistency of each dimension was checked via Cronbach coefficient ($\alpha > 0.70$) and the construct validity is performed by using Pearson correlation coefficients ($\rho > 0.30$). For the quantitative analysis, generalized ordered logit model regressions (non-proportional odds model, [14]; [36] were conducted, followed by a set of testing alternative models. It is important to mention that

this current study assumes all predictable variables are exogenous.

Theorized baseline model (model 1) theorizes that T - Leadership functions better differs when its items are studied as a dimension. This model assumes no interaction effects among the exogenous variables. The exogenous variables are communication, global engagement, strategy for impact, research funding, and university autonomy.

Alternative models consist of model 2 that tests the interaction of T - Leadership with communication and the interaction of T - Leadership with global engagement. Model 3 tests the interaction T - Leadership with global engagement only. Models 2 and 3 includes the same exogenous variables as Model 1.

Discussions and Implications

The reliability of all dimensions' variables was determined by using Cronbach's alpha method. The dimensions exhibited overall alpha scale greater than 70% acceptable criteria (Table 1), suggesting that all variables met internal reliability consistency at aggregation levels.

The validity of instruments is conceptually difficult to prove quantitatively without a standard. However, some evidence may be built over time. One method is to check construct validity. The construct validity is supported by two evidences: (i) the high internal consistency mentioned above; (ii) the convergent criteria related validity which is assessed by the internal correlation matrix for each dimension (Table 1, column 3).

All dimensions met the convergent criteria as all correlations were greater than 0.30 and statistically significant at 1% level (interclass correlation values ranged from 0.78 - 0.85 for T - Leadership, to 0.39 - 0.51 for communication, to 0.60 - 0.85 for global engagement, and to 0.81 - 0.88 for strategy for impact). Overall, one might say that these findings support the aggregation of the single-level measures of the above dimensions. Finally, the correlations between all variables (Table 1, column 4) showed significant correlations for all combinations, suggesting that these variables are important for this study.

Table 1: Internal Consistency, Convergent Validity, and Correlations

Variable	Internal Consistency Criteria: $\alpha > 0.70$	Convergent Validity Criteria: $\text{correlation} > 0.30$	Correlation					
			1	2	3	4	5	6
1. T- Leadership	0.94	0.79 – 0.85*	—					
2. Communication	0.78	0.39 – 0.51*	-0.40*	—				
3. Global Engagement	0.82	0.60 – 0.85*	0.57*	-0.23*	—			
4. Strategy for Impact	0.95	0.81 – 0.88*	0.62*	-0.23*	0.65*	—		
5. Path-TWCU			0.31*	-0.26*	-0.33*	0.32*	—	
6. Research funding			-0.01*	-0.04*	-0.02*	-0.01*	-0.02*	—
7. University Autonomy			-0.31*	0.22*	-0.28*	-0.32*	0.27*	-0.18*

Notes: α and correlations stand for Cronbach 's Alpha and Pearson coefficients respectively

* Correlation is significant at $p < 0.01$; $N = 286$.

To gain additional confidence of the efficacy of the results, the study tested all competing models against the entire data set. Then, comparative analysis between these models was conducted. This comparison was based on the model fit statistics and tests across models (Table 2). The following fit indices were assessed to evaluate the models recommended by the literature [19] and [6]. The model fit statistics are based on analysis of AIC, BIC [17]and RMSEA.

The threshold for the RMSEA is $< .05$ [8], although Hoyle [15] summarizes the interpretation of RMSEA as follows: a) from zero to .05 certainly acceptable fit; b) the range of .05-.08 as close fit; c) .08-.10 as marginal fit; and d) over .10 as unacceptable fit. In addition, testing across models are based on the significance of $\Delta(\chi^2)$ difference's test between two models. This test was conducted to compare different models [8]. A non-significant chi-square comparison ($p \geq .05$) would indicate the better model.

Table 2: Specification Tests ^a

Models ^b	χ^2/df	AIC	BIC	RMSEA
Baseline model:3	2.89	1281	1318	0.049
Alternative model:2	3.45	1323	1369	0.058
Alternative model:1	3.28	1349	1404	0.057
Testing results across models	$\Delta(\chi^2)$	df	Prob.	Model selection
Model:1 vs. Model:2	0.988	2	$p > 0.05$	2
Model:2 vs. Model:3	3.042	1	$p > 0.05$	3

Note.

^a See for example, Schermelleh-Engel, K., Moosbrugger, H., & Muller, H. [28].

^bAIC - Akaike information criteria; BIC - Bayesian information criterion; RMSEA - Root mean square error of approximation; $\Delta(\chi^2)$: Chi square difference.

Under the assumption that model fit is generally acceptable, a more complex model should be preferred; if not, the simpler model would be favored [15]. While all model specifications are in the acceptable range for goodness of fit (for example, RMSEA < 0.06), model 2 shows the most satisfactory criteria and fit the data best under all contextual conditions: AIC = 1281, BIC = 1318, and RMSEA = 0.049. Finally, as shown in the second part of Table 3, the chi-square tests vis-à-vis the other specifications supports the choice of model 3, and hence reinforces the previous findings that the alternative model 3 shows the most satisfactory fit criteria.

Table 3 shows estimates of the marginal effects and their respective standard errors. First, and probably the most important results, show a positive sign of T-leadership implying a positive marginal probability effect to enhance world-class university status. This effect is about 0.11 meaning a 1% increase in T-leadership raises the probability of world-class status by 9%. In addition, and the most striking findings is that the interaction of T-leadership with global engagement, although significant at the 5% level, has a small marginal effect on the probability of the dependent variable (6%). For the remaining significant estimates, research funding and university autonomy shows negative-marginal probability effects of 0.223 and 0.301 respectively.

Table 3: Selected Model with Its Average Marginal Effect and Standard Errors

Variables	Alternative Model 3		
	Parameter Estimates	Average Marginal Effect Estimates	Standard Errors
Communication	- 0.170***	- 0.190***	0.051
Global Engagement	- 0.147***	- 0.007***	0.001
Strategy for Impact	0.007	0.001	0.005
Research funding	- 0.092***	- 0.223***	0.009
University Autonomy	- 0.585***	- 0.301***	0.008
T – Leadership	0.084*	0.070*	0.040
Global Engagement * T – Leadership	0.151**	0.060**	0.029

Note: *significant at 10% level; ***significant at 1% level.

Conclusion

The current study focused on identifying a parsimonious model that may help institutions to achieve a world-class university status. A nationwide survey data obtained from faculty with good experience on the subject of interest, was used to examine how these institutions have taken on this challenge.

The results of this study selected a model with interaction effect. That is an interaction of a positively significant variable with a negatively significant variable. In this study, T-leadership interacts positively with global engagement and therefore enhance the path to world-class university status. But, it is important to mention the significance of other predictable variables, such as communication, global engagement, research funding, and university autonomy that may refrain such path.

Limitations and future directions: the author suggests that this study is the first in SA to conduct quantitative analysis for world-class university status. And investing model specifications by considering interaction effects to find the best model fit is very important for policy decision process. The current study was limited only to institutions that are listed on the ranking table published by THE and participants should possess good experience on the subject of interest. To improve the efficiency of the estimated parameters, possible research may increase the sample size of the study by including more institutions and more stakeholders' opinions.

Regarding the no significance of strategy for impact, a possible solution is that SA decision makers should elaborate policy guidelines for world-class university status, both at the national and institutional levels, where they explicitly state which institutions are involved in this process, the government's expenditure share for each of the selected institutions, a benchmark list with peers from world-class university status for real impacts, and a periodic monitoring system for improvement and accountability.

As for institutional level, decision makers should not only find external funding from credible donors to support their research activity in a clearly defined field, but also well-selected talented researchers from worldwide who are productive and impactful.

Conflict of Interest

There is no conflict of interest in this manuscript by the author.

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