New Tools for Measuring Global Academic Performance

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Abstract
The study is on performance measurement in academia. It aims at developing and validating the measurement scale for the performance of higher institutions. The items were developed based on the extant literature. Data were collected via an online survey in which a questionnaire link was sent to 269 vice chancellors/presidents of the sampled universities. A total of 133 responses were retrieved at the end of the data collection period. This study used proportionate random sampling for sample selection. The goodness of measures was checked via field experts, academicians, and data analysis with SPSS. Overall, the alpha coefficient was .974. The outcome of exploratory factor analysis (EFA) exposed all factors loaded more than 0.50. The results revealed that the instrument was reliable and valid. Hence, the instrument developed was suitable to be used in examining the performance of higher institutions.

Keywords
performance measurement, universities, higher institutions

Introduction
Performance measurement is fundamental to all organizations, academia inclusive, where government and other stakeholders are given more concern to the performance of higher institutions across different countries. Some of them have been experimenting with market-type mechanisms to force their institutions to compete via outstanding performance for both students and funding through fees and a research grant (Dill & Soo, 2004). Furthermore, government flow grant to institutions where performance manifested, with good research output and high placement in ranking (Altbach & Balan, 2007). Institutions with high performance get more income than lesser performing institutions, which would provide performers with a competitive edge that would stimulate less performing institutions (Herbst, 2007).

However, the point of contention is a general-accepted performance measures scale in universities and other higher institutions of learning. Stakeholders are left with university ranking in accessing performance in the academic cycle as accreditation agencies are becoming out of passion. It is beyond doubt that university rankings have become a significant part of the tertiary education landscape around the globe (Marmolejo, 2015). Indeed, a scientific and general performance measures are required in academia to serve as indicators for justification to the stakeholders that will guide decision-making process.

Research has been conducted on organizational performance and a number of performance measures have been developed (e.g., Kaplan & Norton, 2005; Lebas & Euske, 2006). Some are based on financial measures (e.g., Kamyabi & Devi, 2012; Liao & Wu, 2009) and nonfinancial indicators (e.g., Gronum, Verreyenne, & Kastelle, 2012; Hilman & Mohamed, 2011; Kaplan & Norton, 2005; Kirby, 2005) and others are based on the combination of both financial and nonfinancial measures (e.g., Bittici, Carrie, & McDevitt, 1997; Kaplan & Norton, 2005; MacDougall & Pike, 2003). These indicators are developed to serve profit-oriented organization, which could not be appropriate to be applied to organizations in the academia where teaching, community service, research, and publications are the main business.

Few studies were also done in the area of higher institution performance measurement, with quite a number focusing on research and teaching indicators (e.g., Asif & Searcy, 2014; Badri & Abdulla, 2004; Cave, Hanney, Kogan, & Trevett, 1988; Lukman, Krajnc, & Glavič, 2010). Other studies made emphasis on income generated from research projects and consultancies (e.g., Asif, Raouf, & Searcy, 2013; Asif & Searcy, 2014; Kells, 1992; Nedwek & Neal, 1994), and some studies focused on students and other stakeholder satisfaction (e.g., Asif & Raouf, 2013; Asif & Searcy, 2014; 

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Education Criteria for Performance Excellence [ECPE], 2011; Houston, 2007; Kells, 1992; Nedwek & Neal, 1994), little attention has been given to academic indicators such as academic reputations, employability of graduate, faculty ratio, Nobel prize and fields medals.

These form part of the most important measurement indicators of universities and higher institutions of learning. For example, Quacquarelli Symonds (QS) World University Rankings did focus on academic reputations; employability of graduate; faculty ratio; and internationalizations in measuring the performance of universities across the globe. In addition, Academic Ranking of World Universities (ARWU) have quality of faculty informs of research that attract Nobel prize and fields medals as indicators for measuring performance of universities in their world ranking.

Therefore, there is a need to develop a more comprehensive measurement scale that will fit the general unique context of higher institutions. Based on the above discussions, the main purpose of this study was to develop and validate a more generous performance measurement scale for universities and other higher institutions of learning.

**Literature Review**

**Organizational Performance**

Performance is considered as an important construct in achieving the goals of any organizational activities. Some see performance as synonymous with success (Olusola, 2011) and another see it as goal-directed activities (Godlovitch, 1993). Although some people see it as accomplishment of a given task measured against preset-known standards of accuracy, completeness, cost, and speed (Bierbusse & Siesfeld, 1997), a number of persons relate performance to effectiveness, efficiency, and productivity in ideal exploitation of resources (Berry, Sweeting, & Goto, 2006; Gleason, Mathur, & Mathur, 2000; Hilman & Abubakar, 2017; Tukamuhabwa, Eyaa, & Friday, 2011). Furthermore, Martinelli (2001) defined performance as a measure of the state of an organization or the outcomes that result from management decisions and the execution of those decisions by employees of the organization.

Looking at it from the result of the management process, Mandy (2009) viewed performance as the outcome of adopting effective management process. The study posited that performance can be measured using some criteria; which includes effectiveness, efficiency, growth, and productivity.

Greenberg (2011) has the view that performance is a set of financial and nonfinancial indicators, which offer data on the level of accomplishment of objectives and results. Similarly, Hilman and Abubakar (2017) and Kamyabi and Devi (2012) emphasized on the financial indicators and defined performance as the firm’s financial capability such as increase in sales, investment, and profit.

The universal agreement among scholars on how organizational performance should be defined is yet to be a reality (Ford & Schellenberg, 1982; Johannessen, Olaisen, & Olsen, 1999). However, Antony and Bhattacharyya (2010) defined the organizational performance as the measure that is used to evaluate and assess the success of an organization to create and deliver the value to its external as well as internal customers. Armstrong and Baron (2002) viewed organizational performance as a strategic and an all-embracing technique to deliver consistent performance to organizations by improving upon the performance of staffs through team spirit and individual contributions.

Equally important, some scholars defined organizational performance as organizations’ ability to achieve organizational goals and objectives (Daft, 2001; Georgopoulos & Tannenbaum, 1957; Wade & Recardo, 2001). In the same way, Yuchtman and Seashore (1967) characterized organizations’ performance as its capacity to exploit its environment for accessing and utilizing the limited resources.

In a broader form as chief executives and business, managers started to comprehend that the success of organizations depends on their ability to attain their main objectives with the minimum of resources within a short period of time. Along these lines, organizational theories supported the idea of accomplishing the desired goals with efficiency and effectiveness on the constraints imposed by the limited resources (Lusthaus & Adrien, 1998). Still, the most standard contention is the definition that incorporates information on the measures of performance as the set of financial and nonfinancial indicators that give information on the level of accomplishment of goals and results (Kaplan & Norton, 2005; Lebas & Euske, 2006).

Financial measures consider organizational assets, budgets, sales volume, revenue growths, or profitability results as variables for measuring performance in organizations (Liao & Wu, 2009), whereas nonfinancial measures consider variables as a competitive advantage, innovation, quality result, improvement trends, among others (Kirby, 2005; Murphy & Cleveland, 1995).

However, it is virtually impossible to provide a generic list of measures, which can be applied to all type of organization (Small & Chen, 1995). Therefore, financial indicators are applied in some situations (Bhimani, 1994) whereas nonfinancial indicators are incorporated in other situations (Abernethy & Lillis, 1995; Westra, Srikanth, & Kane, 1996). Nonfinancial indicators are superior measures in evaluating the firms’ performances on competitive advantages (Gronum et al., 2012; Hilman, 2009; Hilman & Abubakar, 2017; Hilman & Mohamed, 2011; Kaplan & Norton, 2005) and the third category is a situation where both financial and nonfinancial measures are put to use (Bititci et al., 1997; Kaplan & Norton, 2005; MacDougall & Pike, 2003). The management strategic goal of each organization should reflect the choice of a measurement criterion (Ward, Duray, Leong, & Sum, 1995).
In this study, performance is viewed at the level of institution, university performance in particular, which is been described to be measured in terms of improvement trends and academic achievement results (Kirby, 2005; Liao & Wu, 2009; Murphy & Cleveland, 1995; Richard, Devinney, Yip, & Johnson, 2009). In line with this, the following subsection discusses performance measures in universities.

Performance Measures in Universities

Universities nowadays are subject to similar pressures of the marketplace. Significant modifications in the competition have made colleges and universities adopt the thought process of a corporate business to the extent that students are currently being treated as customers (Hilman & Abubakar, 2017; Zwain, Teong, & Othman, 2012). Moreover, the stakeholder demands are getting more and more complex, which must be attended to whether the educational organization must keep up its competitive advantage (Zwain et al., 2012).

The universities must ensure and provide the students with high-quality service. They have an obligation of producing graduates who can suit the developing societal difficulties, for example, graduates producing high-quality profile and competence in their respective profession (Suryadi, 2007).

Hazelkorn (2015) stated most of higher education institutions used peer review and accreditation as their performance assessment. However, the outcomes of these instruments were really difficult to understand by layperson and this leads to break down in trust among stakeholders (Hilman & Abubakar, 2017).

Previously, quality improvement practices were used by several higher education institutions as a yardstick (Widrick, Mergen, & Grant, 2002). There were some mixed opinions about performance measurement where some scholars said performance evaluation must consider student’s related academic achievement only, meanwhile some scholars said it is important to measure student’s-related academic achievement and nonstudents-related academic achievement (Ball & Wilkinson, 1994; Higgins, 1989; Hilman & Abubakar, 2017; Johnes & Taylor, 1990).

Student’s-related academic attainment contains student academic status, classes of degree, and graduation rates as indicators for assessing university performance (Ball & Wilkinson, 1994; Higgins, 1989; Hilman & Abubakar, 2017). Johnes and Taylor (1990) said undergraduate’s wastage rate should be considered for assessing university performance.

In addition, Agha (2007), Lee and Buckthorpe (2008), Sall (2003), and Asif et al. (2013) emphasized on undergraduate’s wastage rate and dropout whereas Asif and Raouf (2013), Kells and Mundial (1992), and Pinilla and Munoz (2005) extended that graduation rate as a variable for assessing university performance.

Hilman and Abubakar (2017) stated that nonstudent’s-related academic achievement consists of having competitive positions, innovation, organizational agility, sustainability, and market share (Deem, 2008; Suryadi, 2007; Wei, Choy, & Yew, 2009).

In another development, other research has made emphases in teaching and research as indicators for measuring performance in academia (Asif et al., 2013; Asif & Searcy, 2014; Badri & Abdulla, 2004; Cave et al., 1988; ECPE, 2011; Lukman et al., 2010; Manjarrés-Henríquez, Gutiérrez-Gracia, Carrión-García, & Vega-Jurado, 2009; Nedwek & Neal, 1994). Other research provides community service as performance indicator in academia (Badri & Abdulla, 2004; ECPE, 2011; Nedwek & Neal, 1994). Patel et al. (2011) identified number of publications, number of citations, impact factor, research funding, degree of co-authorship, and h index as common research performance indicators. Some made emphasis on financial performance with respect to the income generated from research projects and consultancies (Asif et al., 2013; Asif & Searcy, 2014; Kells, 1992; Nedwek & Neal, 1994).

New league tables and national university rankings are some of the famous tools established to determine university performance that pushes competitions in the global higher education (Hilman & Abubakar, 2017).

QS World University Rankings (2016), Times Higher Education World University Ranking (2016), ARWU (2016), and Ranking Web of Universities (Webometrics; 2016) are the famous ranking bodies that assess global university performance and ranks university accordingly (Altbach, 2013; Hilman & Abubakar, 2017).

In line with the prior discussion, the measurement indicators provided by the femurs university ranking bodies with few others seems appropriate to the peculiar context of higher institutions. Even so, similarities exist in the said measures of these ranking bodies (Aguillo, Bar-Ilan, Levene, & Ortega, 2010) but another shortcoming of the individual ranking methodology also does (Altbach, 2012). Therefore, these measurements are foundation for further improvement, which this study adapted, analyzed, synthesized, and made some improvement with empirical validation.

Data and Methodology

Procedure and Participant

First of all, 14 items of measurement were developed based on the extant literature, which was subjected to the process of face validity through expert assessment (Green, Tull, & Albaum, 1988) to ascertain the extent to which the items are measuring the construct it supposed to measure.

To achieve the objective of this research, a quantitative approach was adopted with the population of 891 top universities that make the list of QS Ranking 2015. Out of which 269 were selected as sample using sample table of
Krejcie and Morgan (1970). Proportionate random sampling techniques was utilized for better representation of the population and the institutions serve as a unit of analysis.

The selected universities are chosen for this study because they are the most performing universities in the world. By extension, the chief executives have the experience, capabilities, and strategies for achieving higher performance. Therefore, their sights on the performance evaluation will aid in coming up with a standard measurement instrument for academia. Table 1 illustrated the sampling of this study.

Instrumentation and Measurement

The developed measurement items were used in designing a structured questionnaire for this study that consists of close-ended multiple-choice questions with 5-point Likert-type scale. The survey contains two sections, the first one consists of statements about the respondents of the study and the second section consists of statement on the items of performance measures.

The design questionnaire was send via an online survey as the main option for the researcher due to the peculiar nature of the research and is best suited when data are to be obtained from widely dispersed geographical locations on a large scale as in this case using structured questions, at a reasonable cost (Sekaran, 2006). With the aid of a Goggle Form online survey, the online questionnaire was sent to the email address of the chief executive of the universities that make the sample of this study.

Two months was set and used for the data collection, and a reasonable number of the respondents responded within the stipulated time. However, the researchers made a double follow-up with the respondents online within the stipulated time frame at a different interval, emphasizing the need and important of their responses to the realization of the objective of this study. The researchers equally notify the respondents in the follow-up mails the reason for their selection in the survey resulting from their outstanding performance and competence that merit them to be on top list of World University ranking as a motivation.

For the analysis, in addition to the face validity mention above, normality assumptions were also diagnosed as well as construct validity through exploratory factor analysis (EFA) with Varimax rotation and reliability analysis to empirically validate the measurement items.

Results and Discussion

Response Rate and Respondents' Profile

Out of the 269 questionnaires sent, 133 responses were retrieved from the Google Form response sheet of the questionnaire at the end of the data collection period. This forms a response rate of 49.44% and is above the expected rate of response as it falls slightly above the common response rate for the online survey. For instance, Ballantyne (2003) recorded 47%, Dommeyer, Baum, Chapman, and Hanna (2002) got 43%, and Baruch (1999) has 39.6% among others in their online survey. Moreover, a response rate of 30% is considered acceptable for a survey (Abubakar & Ahmed, 2017; Hair, Black, Babin, Andersen, & Tatham, 2010; Sekaran, 2003).

The descriptive analysis tells that majority of the chief executive/management staff of the top universities are male 67.7% and followed by 32.3% of female. 87.2% of the respondents are above 50 years and 12.8% have their age range between 41 and 50 years. This provides assurance that grown-up, knowledgeable, and experienced qualities form the majority of the respondents.

In addition, in terms of location, 2.3% of the respondents are from African universities, 10.5% from Asia, 48.1% from Europe, 27.8% from North America, 1.5% Oceania, and 9.8% from South America. This shows a fear representation of the universities from different region/continent in more or less their proportion in the QS ranking 2015 as design from the sampling techniques.

| Serial number | Region      | Number of universities from QS ranking | Estimated percentage of total universities (%) | Sample size for strata |
|---------------|-------------|----------------------------------------|-----------------------------------------------|------------------------|
| 1             | Africa      | 18                                     | 2.02                                          | 5                      |
| 2             | Asia        | 224                                    | 25.14                                         | 68                     |
| 3             | Europe      | 338                                    | 37.93                                         | 102                    |
| 4             | North America | 199                                   | 22.33                                         | 60                     |
| 5             | Oceania     | 41                                     | 4.61                                          | 13                     |
| 6             | South America | 71                                    | 7.97                                          | 21                     |
| Total         |             | 891                                    | 100                                           | 269                    |

Note. QS = Quacquarelli Symonds.
For the universities’ years of existence, the majority of the universities with 66.2% are in existence for more than 80 years, 27.1% have their years of existence range between 61 and 80 years, only 6.8% falls in the range of 41 and 60 years, and none of the universities are below 40 years. This implies that the sampled universities are full of experience and are in the best position to get useful and desired information on the issues and challenges of university performance.

Similarly, for the university ranking, 13.5% are from the top first 100 universities, 21.1% have their placement range between 101 and 300, 20.3% range between 301 and 500, 24.1% range between 501 and 700, and again 21.1% of the sampled universities ranked 700+. This has shown a fair representation of the universities from the top up, top middle, and top down of the ranking. This implies that their responses may help in coming up with good performance measures in the academia.

Table 2. Summary of Respondents Profile.

| Serial number | Items                      | Frequency | Percentage (%) |
|---------------|----------------------------|-----------|----------------|
| 1 Gender      | Male                       | 90        | 67.7           |
|               | Female                     | 43        | 32.3           |
| 2 Age         | Less than 20 years         | 0         | 0              |
|               | 21-30 years                | 0         | 0              |
|               | 31-40 years                | 0         | 0              |
|               | 41-50 years                | 17        | 12.8           |
|               | 51 years and above         | 116       | 87.2           |
| 3 Position    | VC/president               | 17        | 12.8           |
|               | DVC/deputy president       | 74        | 55.6           |
|               | Others (management staff)  | 42        | 31.6           |
| 4 Location    | Africa                     | 3         | 2.3            |
|               | Asia                       | 14        | 10.5           |
|               | Europe                     | 64        | 48.1           |
|               | North America              | 37        | 27.8           |
|               | Oceania                    | 2         | 1.5            |
|               | South America              | 13        | 9.8            |
| 5 Years of existence | Less than 20 years | 0         | 0              |
|               | 21-40 years                | 0         | 0              |
|               | 41-60 years                | 9         | 6.8            |
|               | 61-80 years                | 36        | 27.1           |
|               | 81 years and above         | 88        | 66.2           |
| 6 Ranking     | First 100                  | 18        | 13.5           |
|               | 101-300                    | 28        | 21.1           |
|               | 301-500                    | 27        | 20.3           |
|               | 501-700                    | 32        | 24.1           |
|               | 700+                       | 28        | 21.1           |

Note. VC = vice chancellors; DVC = deputy vice chancellors.

Considering the above information, it could be summarized that the respondents who participated in the survey have the capacity and are in better position to provide adequate and relevant information that will assist in addressing the set objectives of the study. Table 2 provides profile summary of the respondents.

Goodness of Measures

Face and content validity. All the items of the survey were given to five experts from the academic who are familiar with the construct—university performance—to valid the face validity. The experts were two professors, two associate professors, and a senior lecturer. The same instruments were distributed to another five professionals who are on universality leadership positions in very high-ranked universities. They include two vice chancellors, two deputy vice chancellors, and a director academic planning and quality assurances. This process makes some questions/items were reworded/rephrased and two dropped to measure the appropriate construct—performance and also to be reasonable to the potential respondents. The final statement design to measure performance in academia is delineated in Table 3 based on academic reputations, employability...
of graduate, faculty/student ratio, research output, internationalization, Nobel prizes and field medals, research grant, abundant resources, infrastructures and facilities, and community service (Figure 1).

**Construct Validity**

The construct validity of the performance measures is determined through EFA with varimax rotation (Kaliappen & Hilman, 2013). Therefore, Kaiser–Meyer–Olkin (KMO) test and Bartlett’s test of sphericity determined the sampling adequacy. The sample was sufficient due to the KMO value above 0.7 (Table 4) with a significant Bartlett’s test.

In addition, the principal component analysis (PCA) method was applied to the 12 items and resulted the extraction of components were greater than 0.5. The eigenvalues were over 3, so all retained (Kaliappen & Hilman, 2013).

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**Table 4. Result of Factor Analysis and Reliability.**

| Items  | Factor loadings | KMO | Eigenvalue | Percentage of variance | Reliability |
|--------|-----------------|-----|------------|------------------------|-------------|
| UP1    | 0.953           |     | 3.67       | 94.99%                 | 0.974       |
| UP2    | 0.947           |     |            |                        |             |
| UP3    | 0.744           |     |            |                        |             |
| UP4    | 0.952           |     |            |                        |             |
| UP5    | 0.945           |     |            |                        |             |
| UP6    | 0.932           |     |            |                        |             |
| UP7    | 0.942           |     |            |                        |             |
| UP8    | 0.952           |     |            |                        |             |
| UP9    | 0.937           |     |            |                        |             |
| UP10   | 0.925           |     |            |                        |             |
| UP11   | 0.938           |     |            |                        |             |
| UP12   | 0.939           |     |            |                        |             |

Note. KMO = Kaiser–Meyer–Olkin; UP = university performance.
All the items were loaded more than the acceptable loading factor with Hair, Black, Babin, Anderson, and Tatham (2006) minimum recommended a level of 0.5. Therefore, no items were deleted. The outcome displayed sampling adequacy and the suitability of the factor model (Abubakar & Hilman, 2017).

Reliability Analysis

The measurement scale reliability of the constructs was investigated through the Cronbach’s alpha coefficient and factor loadings. Even though, there is a lot deliberation regarding the best technique to calculate reliability, the Cronbach’s alpha coefficient is the universal technique used (Hair et al., 2010; Sekaran & Bougie, 2010).

For this study, the construct has excellent reliability with Cronbach’s alpha above .90 (Hair et al., 2010). Consequently, all items are retained and the result of factor analysis and reliability shown in Table 4.

Discussions and Conclusion

Evidence reported in this study has shown that the measurement scale has high reliability and assesses a single construct of performance measures in academia. The empirical validation was done with the views of the chief executives of the top university in the QS ranking 2015 on the measurement scale due to their wealth of knowledge and experience in academe.

The good validity and reliability of the measurement scale imply that the instruments are fit in measuring performance in higher institutions of learning taking their peculiarities into cognizance. In a nutshell, this study has empirically validated the instrument for measuring performance in academicians. Consequently, this article recognized an empirically valid and reliable instrument to measure performance in academicians, which will facilitate more future studies in the context of performance in higher institutions.

The results of factor analysis showed the KMO value of 0.908 and Bartlett’s test of sphericity was significant. The eigenvalue was greater than 1 and factor loadings were exceeding of 0.5 for all the items (Kaliappen & Hilman, 2013). In addition, reliability test revealed that the items possess an alpha value of .974. Therefore, the new tools have exceeded of 0.5 for all the items (Kaliappen & Hilman, 2017). The limitation to this article is that the data used in the analysis were limited to the chief executive’s (vice chancellors/presidents) perception of the top universities in the QS ranking. Hence, future research should consider using same measurement scale with the addition of the view of some key people from supervising ministries.

Authors’ Note

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References

Abubakar, A., & Hilman, H. (2017). Validity and reliability of the strategic factors and organizational performance scales. International Journal of Organizational and Business Excellence, 2, 16-27.

Abubakar, A., & Ahmed, S. (2017). The effect of a transformational leadership style on the performance of universities in Nigeria. Pakistan Journal of Educational Research and Evaluation, 2, 59-76.

Abernethy, M. A., & Lillis, A. M. (1995). The impact of manufacturing flexibility on management control system design. Accounting, Organizations and Society, 20, 241-258.

Agha, K. (2007). Key performance indicators: A successful tool for performance management in the education industry in the Sultanate of Oman. India Management Journal, 1(3/4), 1-10.

Aguillo, I. F., Bar-Ilan, J., Levene, M., & Ortega, J. L. (2010). Comparing university rankings. Scientometrics, 85, 243-256.

Altbach, P. G. (2012). The globalization of college and university rankings. Change: The Magazine of Higher Learning, 44, 25-61.

Altbach, P. G. (2013). Rankings season is here. In The international imperative in higher education (pp. 81-88). Sense Publishers.

Altbach, P. G., & Balan, J. (2007). World class worldwide: Transforming research universities in Asia and Latin America. Baltimore, MD: Johns Hopkins University Press.

Antony, J. P., & Bhattacharyya, S. (2010). Measuring organizational performance and organizational excellence of SMEs—Part 2: An empirical study on SMEs in India. Measuring Business Excellence, 14(3), 42-52.

Armstrong, M., & Baron, A. (2002). Strategic HRM: The key to improved business performance. London, UK: Chartered Institute of Personnel and Development.

Asif, M., & Raouf, A. (2013). Setting the course for quality assurance in higher education. Quality & Quantity, 47, 2009-2024.
Asif, M., Raouf, A., & Searcy, C. (2013). Developing measures for performance excellence: Is the Baldrige criteria sufficient for performance excellence in higher education? *Quality & Quantity*, 47, 3095-3111.

Asif, M., & Searcy, C. (2014). A composite index for measuring performance in higher education institutions. *International Journal of Quality & Reliability Management*, 31, 983-1001.

Badri, M. A., & Abdulla, M. H. (2004). Awards of excellence in institutions of higher education: An AHP approach. *International Journal of Educational Management*, 18, 224-242.

Ball, R., & Wilkinson, R. (1994). The use and abuse of performance indicators in UK higher education. *Higher Education*, 27, 417-427.

Ballantyne, C. (2003). Measuring quality units: Considerations in choosing mandatory questions. In *Evaluations and assessment conference: A commitment to quality* (pp. 24-25). Adelaide: University of South Australia.

Baruch, Y. (1999). Response rate in academic studies—A comparative analysis. *Human Relations*, 52, 421-438.

Berry, A. J., Sweeting, R., & Goto, J. (2006). The effect of business advisers on the performance of SMEs. *Journal of Small Business and Enterprise Development*, 13, 33-47.

Bhimani, A. (1994). Modern cost management: Putting the organization before the technique. *International Journal of Production Economics*, 36, 29-37.

Bierbusse, P., & Siesfeld, T. (1997). Measures that matter. *Journal of Strategic Performance Measurement*, 1(2), 6-11.

Bititci, U. S., Carrie, A. S., & McDevitt, L. (1997). Integrated performance measurement systems: A development guide. *International Journal of Operations & Production Management*, 17, 522-534.

Cave, M., Hanney, S., Kogan, M., & Trevett, G. (1988). *The use of performance indicators in higher education: A critical analysis of developing practice*. London, England: Jessica Kingsley.

Daft, R. L. (2001). *Essentials of organization theory and design*. Mason, OH: South-Western Educational Publishing.

Deem, R. (2008). Producing and re-producing the global university in the 21st century: Researcher perspectives and policy consequences. *Higher Education Policy*, 43, 439-456.

Dill, D. D., & Soo, M. (2004). Transparency and quality in higher education markets. In P. Teixeira, B. Jongbloed, D. Dill, & A. Amaral (Eds.), *Markets in higher education: Rhetoric or reality?* (pp. 61-85). Dordrecht: Kluwer.

Dommeyer, C. J., Baum, P., Chapman, K. S., & Hanna, R. W. (2002). Attitudes of business faculty towards two methods of collecting teaching evaluations: Paper vs. online. *Assessment & Evaluation in Higher Education*, 27, 455-462.

Education Criteria for Performance Excellence. (2011). 2011-2012 *education criteria for performance excellence*. Gaithersburg, MD: National Institute of Standards and Technology.

Ford, J. D., & Schellenberg, D. A. (1982). Conceptual issues of linkage in the assessment of organizational performance. *Academy of Management Review*, 7, 49-58.

Georgopoulos, B. S., & Tannenbaum, A. S. (1957). A study of organizational effectiveness. *American Sociological Review*, 22, 534-540.

Gleason, K. C., Mathur, L. K., & Mathur, I. (2000). The inter-relationship between culture, capital structure, and performance: Evidence from European retailers. *Journal of Business Research*, 50, 185-191.

Godlovitch, S. (1993). The integrity of musical performance. *The Journal of Aesthetics and Art Criticism*, 51, 573-587.

Green, P. E., Tull, D. S., & Albaum, G. (1988). *Research for marketing decisions*. Englewood Cliffs, NJ: Prentice Hall.

Greenberg, J. (2011). *Behavior in organizations* (10th ed.). Upper Saddle River, NJ: Prentice Hall.

Gronum, S., Verreyne, M. L., & Kastelle, T. (2012). The role of networks in small and medium-sized enterprise innovation and firm performance. *Journal of Small Business Management*, 50, 257-282.

Hair, J. F., Black, W. C., Jr., Babin, B. J., Andersen, R. E., & Tatham, R. L. (2006). *Multivariate data analysis* (6th ed.). Upper Saddle River, NJ: Pearson Education.

Hair, J. F., Black, W. C., Jr., Babin, B. J., Andersen, R. E., & Tatham, R. L. (2010). *Multivariate data analysis: A global perspective* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Hazelkorn, E. (2015). *Rankings and the reshaping of higher education: The battle for world-class excellence*. Basingstoke, UK: Palgrave Macmillan.

Herbst, M. (2007). *Financing public universities: The case of performance funding*. Dordrecht, The Netherlands: Springer.

Higgins, J. C. (1989). Performance measurement in universities. *European Journal of Operational Research*, 38, 358-368.

Hilman, H. (2009). Relationship of competitive strategy, strategic flexibility and sourcing strategy on organizational performance (Unpublished PhD thesis). Universiti Putra Malaysia, Malaysia.

Hilman, H., & Abubakar, A. (2017). Strategic talent management and university performance: A theoretical perspective. *European Journal of Business and Management*, 9(4), 35-40.

Hilman, H., & Mohamed, Z. A. (2011). Sourcing strategies, practices and effects on organizational performance. *Journal for Global Business Advancement*, 4, 18-31.

Houston, D. (2007). TQM and higher education: A critical systems perspective on fitness for purpose. In *Quality in Higher Education*, 13, 3-17.

Johannessen, J. A., Olaisen, J., & Olsen, B. (1999). Strategic use of information technology for increased innovation and performance. *Information Management & Computer Security*, 7, 5-22.

Johnes, J., & Taylor, J. (1990). *Performance indicators in higher education*. Buckingham, UK: Society for Research into Higher Education & Open University Press.

Kaliappen, N., & Hilman, H. (2013). Validity and reliability of the strategic factors and organizational performance scales. *Middle-East Journal of Scientific Research*, 16, 1719-1724.

Kamyyabi, Y., & Devi, S. (2012). The impact of advisory services on Iranian SME performance: An empirical investigation of the role of professional accountants. *South African Journal of Business Management*, 43, 61-72.

Kaplan, R. S., & Norton, D. P. (2005, July-August). The balanced scorecard: Measures that drive performance. *Harvard Business Review*, 83(7), p. 172.

Kells, H. R. (1992). *Performance indicators for higher education: A critical review with policy recommendations* (No. PHREE/92/56). Washington, DC: Education and Employment...
Abubakar et al.

Division, Population and Human Resources Department, The World Bank.

Kirby, J. (2005, July-August). Toward a theory of high performance. *Harvard Business Review*, 83(7), 30-39.

Krejcie, R. V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Lebas, M. J., & Euske, K. (2006). A conceptual and operational delineation of performance. In A. Neely (Ed.), *Business performance measurement: Theory and practice* (pp. 125-139). Cambridge, UK: Cambridge University Press.

Lee, C., & Buckthorpe, S. (2008). Robust performance indicators for non-completion in higher education. *Quality in Higher Education*, 14, 67-77.

Liao, S. H., & Wu, C. C. (2009). The relationship among knowledge management, organizational learning, and organizational performance. *International Journal of Business and Management*, 4(4), 64-76.

Lukman, R., Krajnc, D., & Glavič, P. (2010). University ranking using research, educational and environmental indicators. *Journal of Cleaner Production*, 18, 619-628.

Lusthaus, C., & Adrien, M. H. (1998). *Organizational assessment: A review of experience* (Universalia Occasional Paper, 31). Montréal, Québec, Canada.

MacDougall, S. L., & Pike, R. H. (2003). Consider your options: Changes to strategic value during implementation of advanced manufacturing technology. *Omega*, 31, 1-15.

Mandy, M. K. (2009). The relationship between innovativeness and the performance of Small and Medium-Size Enterprises (SMEs) of Malaysia manufacturing sector. *International Journal of Management and Innovation*, 14(2), 1-14.

Manjarrés-Henríquez, L., Gutiérrez-Gracia, A., Carrión-García, A., & Vega-Jurado, J. (2009). The effects of university–industry relationships and academic research on scientific performance: Synergy or substitution? *Research in Higher Education*, 50, 795-811.

Marmolejo, F. (2015). Are we obsessed with rankings? Voices of dissent and concern. *Higher Education in Russia and Beyond*, 2(4), 7-8.

Martinelli, P. D. (2001). Systems hierarchies and management. *Systems Research and Behavioral Science*, 18, 68-81.

Murphy, K. R., & Cleveland, J. (1995). *Understanding performance appraisal: Social, organizational, and goal-based perspectives*. Thousand Oaks, CA: SAGE.

Nedwek, B. P., & Neal, J. E. (1994). Performance indicators and rational management tools: A comparative assessment of projects in North America and Europe. *Research in Higher Education*, 35, 75-103.

Olusola, O. A. (2011). Accounting skill as a performance factor for small businesses in Nigeria. *Journal of Emerging Trends in Economics and Italic Management Sciences*, 25, 732-738.

Patel, V. M., Ashrafian, H., Ahmed, K., Arora, S., Jiwan, S., Nicholson, J. K., . . . Athanasiou, T. (2011). How has healthcare research performance been assessed? A systematic review. *Journal of the Royal Society of Medicine*, 104, 251-261.

Pinilla, B., & Munoz, S. (2005). Educational opportunities and academic performance: A case study of university student mothers in Venezuela. *Higher Education*, 50, 299-322.

Quacquarelli Symonds World University Rankings. (2016). *Methodology*. Retrieved from https://www.topuniversities.com/university-rankings/world-university-rankings/2016

Ranking Web of Universities. (2016). *Ranking web of universities: Methodology*. Retrieved from http://www.webometrics.info/en/Methodology

Richard, P. J., Devinney, T. M., Yip, G. S., & Johnson, G. (2009). Measuring organizational performance: Towards methodological best practice. *Journal of Management*, 35, 718-804.

Sall, M. Y. (2003). Evaluating the cost of wastage rates: The case of the University Gaston berger du Senegal. *Higher Education Policy*, 16, 333-349.

Sekaran, U. (2003). *Research methods for business: A skill-building approach*. New York: John Wiley & Sons.

Sekaran, U. (2006). *Research methods for business: A skill-building approach*. New York: John Wiley & Sons Ltd.

Small, M. H., & Chen, I. J. (1995). Investment justification of advanced manufacturing technology: An empirical analysis. *Journal of Engineering and Technology Management*, 12, 27-55.

Suryadi, K. (2007). Framework of measuring key performance indicators for decision support in higher education institution. *Journal of Applied Sciences Research*, 3, 1689-1695.

Times Higher Education World University Ranking. (2016). *Methodology*. Available from https://www.timeshighereducation.com

Tukamuhabwa, B. R., Eyya, S., & Friday, D. (2011). Mediating variables in the relationship between market orientation and supply chain performance: A theoretical approach. *International Journal of Business and Social Science*, 2(22), 99-107.

Wade, D., & Recardo, R. J. (2001). *Corporate performance management: How to build a better organization through measurement-driven strategic alignment*. Butterworth-Heinemann: Routledge.

Ward, P. T., Duray, R., Leong, G. K., & Sum, C. C. (1995). Business environment, operations strategy, and performance: An empirical study of Singapore manufacturers. *Journal of Operations Management*, 13, 99-115.

Wei, C. C., Choy, C. S., & Yew, W. K. (2009). Is the Malaysian telecommunication industry ready for knowledge management implementation? *Journal of Knowledge Management*, 13, 69-87.

Westra, D., Srikanth, M. L., & Kane, M. (1996). Measuring operational performance in a throughput world. *Strategic Finance*, 77(10), 41-47.

Widrick, S. M., Mergen, E., & Grant, D. (2002). Measuring the dimensions of quality in higher education. *Total Quality Management*, 13, 123-131.

Yuchtman, E., & Seashore, S. E. (1967). A system resource approach to organizational effectiveness. *American Sociological Review*, 32, 891-903.

Zwain, A. A. A., Teong, L. K., & Othman, S. N. (2012). Knowledge management processes and academic performance in Iraqi HEIs: An empirical investigation. *International Journal of Academic Research in Business and Social Sciences*, 2, 273-293.
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