

Conceptualizing and validating resource recombination in context of higher educational institution competitiveness

Conceptualizing
and validating
resource

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Abstract

Purpose – The purpose of this paper is to explore how resource recombination (RR) may be conceptualized with special reference to the competitiveness of Higher Education Institutions (HEI).

Design/methodology/approach – The paper consists of two main studies. Building on pertinent available literature on the subject area, a qualitative investigation was conducted with the help of a semi-structured interview guide. Findings of study one were systematically analysed against a literature derived template. Study two presents a quantitative survey investigation that follows from the codes and themes derived from study one. In study two, findings were validated and analysed with the help of structural equation modelling.

Findings – Study one findings identified a total of 64 individual themes representing resources (21 themes), business processes (29 themes) and complementary factors (14 themes), as elements of RR in HEI competitiveness. In study two, the measurement model for RR was found to contain five main factors, namely, asset, research and affiliation processes, automated technology management, financial support for HR and departmental initiatives mainstream staff rewards and retention and institutional brand image appeal.

Practical implications – A significant contribution is made to theory development in the area of RR. Other implications to HEI competitiveness in contribution to national development were offered.

Originality/value – The area of RR remains largely uncovered in strategic management. Conceptualizing RR in the context of HEI competitiveness is new and in the right direction to jumpstart interest in this area by proposing a validated measurement model of HEI.

Keywords Scale development, Higher educational institutions, Resources recombination, Institutional competitiveness

Paper type Research paper



Introduction

Institutional resources are essential to organisational survival, growth and development regardless of origin and industry. However, the mere possession of resources and knowledge structures is not enough. Rather, as they are central to strategic management, resources should be synchronised and managed effectively to realise the potential for competitive advantage (Barney, 1991; Kor and Mahoney, 2005; Kong and Prior, 2008; Holcomb *et al.*, 2009; Pavlou and El Sawy, 2011; Kurzhals, 2015). The firm's competitiveness originates from its ability to recombine the resources available into a productive heterogeneous mix that is difficult for the competitors to copy through a process known as resource recombination (RR). RR is defined as the recombination of resources in new ways to develop new and innovative products or services or to enter new markets (Schumpeter, 1934; Schreyögg and Kliesch, 2003). RR channels provide variety and an innovative performance towards internal and external competency development (Cecere and Ozman, 2014). Thus, RR remains the bedrock of innovation, entrepreneurship, learning, absorptive capacity development and many other peculiarities of knowledge management (Galunic and Rodan, 1998; Wiklund *et al.*, 2002).

Even though it may be argued that managerial control is principally internal to the firm and that the external environment is largely outside of the managerial scope, RR presents the ability to establish external capabilities through local and distinct knowledge search and reconfiguration mechanisms that permit the siphoning of external knowledge into the organisation (Ridder, 2013), mainly through alliances and development (Cecere and Ozman, 2014).

As in any other institution, the strategic management of resources and business processes is as important in a Higher Education Institution (HEI). The efficient heterogeneous mix and leveraging of HEI resources results in an enhanced HEI contribution to the national knowledge economy and it is thus deserving of attention (Williams, 2014).

The role of HEI's in human, social and economic development has been firmly established (Escrigas, 2008). For example, graduate business start-ups and overall job creation (Greene *et al.*, 2004; Rideout and Gray, 2013), which enhanced the student venture creation skills, knowledge and attitudes (Greene and Saridakis, 2008), hugely contributes to the growth and development of an economy (Bosma *et al.*, 2008). Nonetheless, the contribution of HEI to development in these areas has remained overly complex, dynamic and malleable (Thomson, 2008).

The HEI sector continues to be dominated by the challenges of resource underfunding (World Bank, 2002), weak faculties, low levels of teaching motivation (Chapman and Austin, 2002), weak infrastructure, poor innovation and out of date teaching methods among others (Thomson, 2008; Zaglul and Juma, 2007; Heward and Bunwaree, 1999). In an era, where HEI remains under strong pressure by both governments and stakeholders for performance excellence (Asif and Searcy, 2014; Cruickshank, 2003; Campatelli *et al.*, 2011; Rosa *et al.*, 2001), RR presents an avenue through which HEIs can better integrate and realign their focus on both tangible and intangible resources and processes (Pollitt, 1990).

According to Yates (2012), tangible resources may represent modern plants, facilities and basic equipment. In HEI, tangible resources include human resources and infrastructure (Asif and Searcy, 2014) while intangible resources includes the skills of literacy (Oxenham *et al.*, 2002), creativity (Zaglul and Juma, 2007), the intuitional brand and reputation/goodwill (Mbengo and Chinakidzwa, 2014) among others. Yates (2012) explained that business processes involve the activities within the organisation as well as the organisation's approach to management. In the HEI context, business processes entail the teaching methodologies, the application for student enrolment and course development among other

institutional internal management processes (Mbengo and Chinakidzwa, 2014). In a similar scope, the business processes may be new or pre-existing in the firm (Kurzahls, 2015).

To conceptualize RR in HEI operationalisation, it is fundamental to uncover the knowledge related to resources and capabilities as the bedrock of performance excellence (Hafeez *et al.*, 2002; Pavlou and El Sawy, 2011). Hence, conceptualising RR in terms of HEI's quest to remain competitive is a step in the right direction to close the knowledge gap on the lack of a clear and validated measurement model for RR. Focussing on this context will not only help in the measurement effort but also it will help to establish insights into how pertinent challenges in the sector may be overcome in its quest for performance excellence.

Theoretical framework

Discovered and first used by Schumpeter (1934), resources recombination, which is also called "Schumpeterian innovation" is widely considered as an innovation when it comes to organisations managing its resource in a competitive world. It practically consists of conceptual and physical materials (Nelson and Winter, 1982, p. 30), and defined by scholars as:

[...] through a reconfiguration of existing resources within the firm, or through the integration of new resources into their existing resource base, firms can introduce new products and services or enter into new markets (Eliasson *et al.*, 2002, p. 152, referring to Schumpeter (1934).

Thus, as argued by Holcomb *et al.* (2009):

Efficient production with heterogeneous resources is a result not of having better resources but in knowing more accurately the relative productive performance of those resources (Holcomb *et al.*, 2009, p. 457).

Nahapiet and Ghoshal (1997) defined RR as the reconfiguration of elements that are originally unconnected or identifying new approaches to reconfigure already connected elements. RR stipulates that competence lies in both the resources and the firm's ability to use these to its advantage. The resource-based view (RBV) approach to strategic management has set a pace in this area and RR builds on this insight to present a whole new avenue to reconfigure resources in a dynamic environment towards the achievement of novel competences in the management of organisational competitiveness (Pavlou and El Sawy, 2011). Thus, building on the RBV perspective, RR remains central to organisational innovation and the development of learning capabilities through knowledge structures (Galunic and Rodan, 1998; Cecere and Ozman, 2014).

Attempts to conceptualise and establish a trusted measurement model for RR has remained frail (Kurzahls, 2015). The definition and orientation of RR as the combination of new and existing inter-connected elements has led to a stream of studies to focus on the variety and functional aspect of RR without a clear measurement framework (Weitzman, 1998; Cecere and Ozman, 2014). A few empirical observations have been made including those by Wiklund *et al.* (2002), Henderson and Clark (1990) and others such as Galunic and Rodan's (1998) conceptual work on the area, and the Kurzahls (2015) model. The Kurzahls (2015) model has key similarities with Henderson and Clark's (1990) changed and unchanged firm's resources and capabilities model, as well as Galunic and Rodan's (1998) model. These studies have presented the grounds for the exploratory assessment of RR, however, does not adequately capture the RR concept.

Kurzahls (2015) identified four main quadrants of RR model, which are:

- (1) existing resources for new business initiatives;
- (2) new business for new business initiative;

- (3) existing resources for ongoing business initiatives; and
- (4) new resources for ongoing business initiatives.

The [Kurzahls \(2015\)](#) model provides useful insights to explore what RR constitutes. It also emphasises the ability of the firm to combine both existing and new resources with existing and new business processes in innovative ways. However, the model does not acknowledge the difference between tangible and intangible resources ([Jugdev et al., 2007](#); [Mathur et al., 2007](#)), and new and existing resources and business processes. A resource or business process that is new to one institution may be existing to another institution. Hence, the model lacks specificity regarding the indicators or dimensions in terms of a practical approach in measuring RR. As such, the model might be suitable for the case study of an individual institution but it may prove impractical on a collective pool of institutions. Labelling resources for any empirical assessment of many institutions provides a duplication of what is new and existing without a clear difference. Such an outcome is of little relevance to the establishment of insights for the development of key implications; whether it is new or existing ([Kurzahls, 2015](#)) or changed and unchanged ([Henderson and Clark, 1990](#)). Therefore, the link between RR and performance excellence is clearly missing.

In addition to these criticisms, following on from the definition of resources by [Barney \(1991\)](#) and [Wernerfelt \(1984\)](#), the distinction of resources being different and separate from the business processes is not exactly clear. A more conventional model of RR must be established. By doing so, HEI competitiveness will permit the cross-sector application of the measurement model.

Research methodology

The area of RR demands an exploratory attempt to clarify and gain insight on indicators that apply in the context of HEI competitiveness. As such, to present a validated measurement model for RR, two main studies were conducted using a sequential exploratory mixed research design. According to [Creswell \(2003\)](#), this approach entails the collection of qualitative data followed by a quantitative observation. [Creswell and Clark \(2007\)](#) and [Creswell \(2003\)](#) argued that this form of methodological approach is essential for the development of a measurement instrument if one is not available. Following a sequential exploratory mixed research approach, interviews were first used to explore unidentified RR items and arrive at a “sensemaking” qualitative model. The items of RR were then considered in a quantitative survey research, which helped validate the items. In the quantitative survey research, an exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were considered to define latent constructs embedded in the interview results that best define RR in context of HEI competitiveness. After investigating RR, the indicators of the study informed the quantitative research approach to establish a parsimonious model of RR. Ultimately, this approach has helped to explore the phenomenon of RR to develop and test the new measurement model.

Both studies focus on the population of the estimated 20,000 workers in the 112 United Arab Emirates (UAE) university campuses listed by the Centre for Higher Education Data and Statistics ([CHEDS \(2012\)](#)). It is important to highlight that the [CHEDS \(2012\)](#) observation excludes technical institutions and colleges across the UAE.

Study one methodology

The main population of the qualitative study entails all of the directors and managers of the 112 campuses across the UAE. These individuals are in a position to offer a detailed overview of the key resources and business processes of their respective institution.

Considering the homogenous nature of the sample institutions, a sample size of about 12 may permit data saturation (Guest *et al.*, 2006). Using the stratified proportional sampling technique, a sample of 21 faculty and non-faculty members was purposively selected for face-to-face interview sessions. The data was collected over a period of 6 weeks with the help of a semi-structured interview guide (Appendix 1) originally based on Pavlou and El Sawy (2011) and Kurzhals (2015) model of RR and other associated findings. The commencing questions were largely descriptive, seeking to identify the core resources and business processes. The follow-up questions were exploratory and unstructured to observe the recombination of the results in institutional competitiveness. Template analysis was conducted with the help of MAXQDA version 12.

Study two methodology

Study two focussed on the population of the academic faculty and non-faculty staff in UAE HEIs. The mainstream faculty members totalled about 8,201, taking into consideration CHEDS (2012) and non-Commission for Academic Accreditation (CAA) projections based on the available data. Non-faculty members were estimated to be about 20,000, based on other countries' proportion of faculty (40 per cent) to non-faculty members (60 per cent) (Lederman, 2012).

Saunders *et al.*'s (2012) nominal sample determination approach was used to arrive at a final sample size of 453 respondents, given a 5 per cent error margin. Using the stratified proportional sampling technique, after an adjustment to the population size, an 80 per cent response rate was presumed. A survey questionnaire (Appendix 2) including all template items originally arrived at the end of analysis of the study one was furthered considered for study two. A seven-point Likert Scale was used. The instrument was placed on the Qualtrics Online Data Collection Platform and a total of 8 weeks were allocated for the data collection. Three sessions of expert reviews were conducted prior to the main phase of the data collection. Analysis was conducted with the help of IBM SPSS Statistics version 25 and IBM SPSS AMOS version 23 in terms of structural equation modelling.

Before conducting the analysis, the issues relating to data coding, editing, outliers and missing data were addressed to have error-free data (Pallant, 2007). The data was first explored using EFA as recommended by Child (1990). CFA was observed in the context of a guided measurement analysis to arrive at a parsimonious model. Risk of Bias and statistical power analysis were further conducted to support the final conceptualised model of RR. Strict adherence to validity, reliability and other model fit criteria were deemed to be essential as outlined by Hair *et al.* (2010) and [. . .] Bentler and Bonnet (1980).

Study one findings and discussions

Findings. A total of 705 individual segments were recorded. Out of which, 134 segments (19 per cent) referred to existing resources while 54 segments (7.7 per cent) referred to new resources. In total, existing business processes recorded 46.1 per cent of all segments while new business processes recorded only 8.23 per cent.

Findings for "recombinations" established that new resources and business processes did not recombine well with other new and existing resources. All forms of recombination recorded made up just 5.8 per cent of the total coded segments; 2.3 per cent of codes were a combination between existing resources and existing business processes and the remaining 3.5 per cent covered all other forms of recombination in the other quadrants across the 35 code segments. Some themes that were rather difficult to clarify or that did not exactly represent any form of resources or business processes were classified into a separate code category labelled "complementary factors". This accounted for 42 code segments or 6 per cent of the total

segments. Interview-related characteristics that were not exactly counted as part of the main data occupied about 7.2 per cent of the total code segments. A brief summary of the code segment is presented in Table I. As part of the findings, a resource or business process was considered to be new or existing based on the interviewee's response regarding the recent nature of or newness of the element in the institution's effort to remain competitive.

Leading existing resources included the faculty members, financial resources and general human resource management. In one comment on the contribution of the faculty, the respondent stated that:

So obviously the faculty is a major part of any institution. I think that if we want to do a survey of students that have left universities, they probably will not remember their courses, like some other people, but they will certainly remember their Faculty. Really, it is best for a university to maximise their resources as far as faculty is concerned.

In another comment on financial resources, they added that:

Certainly, [University name] is not one of the schools where we have limitless funds [in terms of faculty provision].

Others commented on government funding as being the key to competitiveness.

Even though technology was highlighted as one of the main existing resources, it was again highlighted as one of the main new resources that boost institutional competitiveness. Finance was also considered to be the second most relevant new institutional resource while new infrastructure played a leading role. The newness of non-faculty intelligence as related to HEI competitiveness was particularly noteworthy:

We make sure that our website is always updated on our research. Therefore, in the competition, we always do lessons learned after each cycle and then we try to improve. And then, in the next cycle of it, there is the brainstorming of before and after. We try to document all the lessons learned through the competition, including future undertakings and all that is important to me.

Existing business processes recorded the most code segments and leading in this area were policies, strategies and programs; these together constituted over 28 per cent of the total code segments. This implies that HEIs are predominantly process-based and this could help to create a new perspective of viewing service organisations in general. One area highlighted under the existing processes was faculty collaboration:

		(%)
Existing resources	134	19.0
New Resources	54	7.7
Existing business process	325	46.1
New business process	58	8.2
<i>Recombinations</i>		
New business process and new resources	6	0.9
Existing business process and existing resources	16	2.3
Existing business process and new resources	1	0.1
New business process and existing business process	7	1.0
Existing business process and new business process	11	1.6
Others factors out of pertinent constructs/Auxiliary items	42	6.0
Demographic factors	51	7.2
Total code segments	705	100

Table I.
Summary of code
segments

We encourage our faculties to collaborate, so it is very rare that one person is good at everything. So, collaboration could be good. Let us say one could be good at conducting surveys and other could be good at analysis, so we encourage collaboration. Not all faculties do it like that.

Other areas such as process automation, teaching methodologies, hierarchical structures and authority of command in campuses, exam policies and processes were a few others that were highlighted.

On new business processes, the adoption of innovative strategies appeared to be the most relevant area. This was closely followed by intelligence gathering as a new business process. One respondent as expressed the newness of intelligence gathering:

From the year 2005 until 2013 - 2014, we did population-based research, and I will show you how our students have done great things. But now, it is not only on the population. Population plus scientific laboratory-based research, in terms of genetics and in terms of molecular things and so forth.

Recombination instances were rather low and negligible in the institutions. This may be observed as an inadequacy of the resource reconfiguration in HEIs or a lack of clear self-awareness of how resource recombination ensues in HEIs. The combination of existing resources and new resources only involved a single code segment.

Among the complementary factors, quality, leadership, synergy, price, transparency, initiatives and other factors such as curriculum and control were observed and discussed. The issue of quality, for instance, was presented as:

The quality processes are very stringent at the university [...] and there is the whole concept of the British accredited university. I think that we are the only one in the market so that gives us a competitive advantage along with the prices and fee structure that we have.

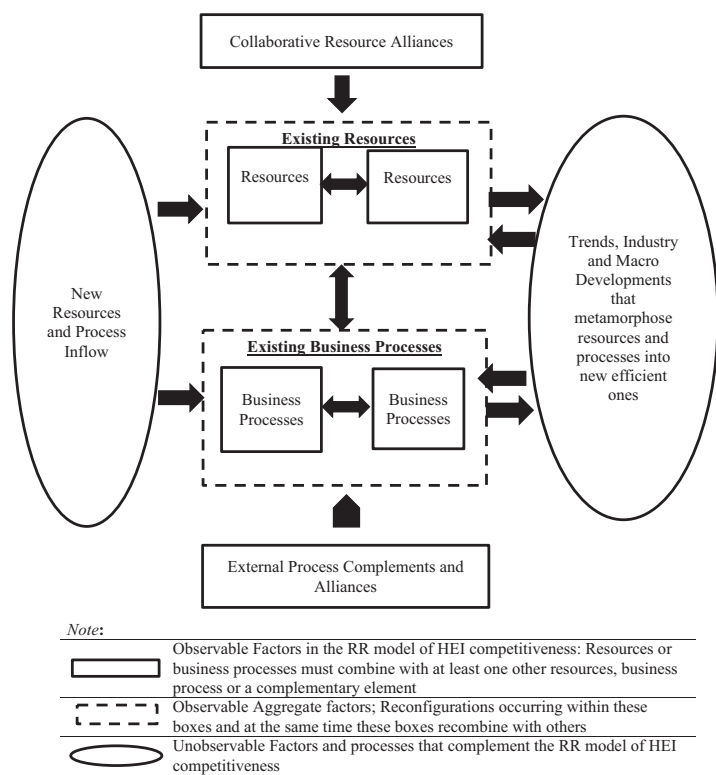
Discussion. Based on these findings, a refined sense-making framework of RR has been presented in [Figure 1](#). This model acknowledges the reconfiguration of the existing resources with other resources and the same for the context of business processes. Any resource or business process that is considered to be new may largely depend on the case study institution. The model also acknowledges that resources recombine with business processes. These observations are both in line with [Pavlou and El Sawy \(2011\)](#) and [Kurzahls \(2015\)](#) original matrix of RR. From a more thorough perspective, the proposed framework captures the constant reconfiguration and evolution of resources and business processes within the organisation and mainly in response to external trends, affiliations and developments. The current model, therefore, covers both areas of incremental and modular resource substitution as well as simple and radical resource recombination as argued by [Henderson and Clark \(1990\)](#). Based on this outcome, resources and business processes (new or existing) were pooled together into a single set of resource elements. Similar themes were also combined where relevant. A total of 21 resource themes, 29 business processes and 14 other complementary factors were observed as in [Tables II and III](#); these mark the results that emerged from the interview findings.

To transform the sense-making framework into a modular construct, the quantitative approach was implemented (study two). The main endpoint of the quantitative model or the RR construct of HEI competitiveness was to arrive at resources and processes with the ability to recombine with other resources and processes within the institution.

Study two findings and discussions

Findings

Demographics, descriptive and data screening. The quantitative study had a response rate of 73.7 per cent rather than the originally 80 per cent anticipated. The descriptive statistics



details have been presented in [Tables IV](#). It was observed that the standard deviation, skewness and kurtosis were all within acceptable limits.

Exploratory factor analysis. As can be seen in [Table V](#), $KMO > 0.8$ and Bartlett's Test of Sphericity were considered to be statistically important when related to the validity of the EFA results ([Gaskin, 2012a, 2012b](#)). Originally, some communalities were observed to be below 0.3 and very close to 0.2. The factor structures were largely distorted and no clear patterns existed. After a thorough modification by the removal of indicators that did not share a significant portion of the variance that was explained, the final findings for EFA have been presented in [Table VI](#).

The pattern matrix revealed a low risk of multicollinearity as argued by [Backhaus et al. \(2010\)](#). The average variance extracted (AVE) and composite reliability (CR) ratios were, as observed, found to be statistically significant or as close to significant as presented in [Appendix 3](#). Below 0.5 loadings but above 0.4 were observed for factors 2, 5, 7 and 8. Below 0.7 but above 0.6 loadings for reliability were also observed for factor 9, related to further analysis. The indicators were reduced from 64 to 37 themes, representing about a 42 per cent cut in the total number of items originally considered. The factors with weak indices were closely monitored to offer some of the factors the chance to reveal their contribution to the variance in the model if some of the more problematic factors were excluded.

Confirmatory factor analysis. The final list of items was plotted into CFA as presented in [Appendix 4](#). Strict model fit thresholds were maintained in the modification of the

Conceptualizing and validating resource			
B	Resources	C	Business processes
B1	Students	C1	Technological processes
B2	Alumni Connectedness	C2	Teaching Processes
B3	Restricted Entry for Student	C3	Collaborative Processes
B4	School brand Image	C4	Student Application Processes
B5	Software	C5	Registry processes
B6	Accreditation	C6	Faculty Meetings
B7	Equipment	C7	Process Automation
B8	Human Resources	C8	Database Management
B9	Institutional Departments	C9	Procurement Processes
B10	Finance/funds	C10	Communication Processes
B11	Infrastructure	C11	Internal Collaboration
B12	Faculty HR Recruitment	C12	Administrative functions
B13	Non-Faculty HR	C13	Customer Service Management
B14	HR Promotions	C14	Exams processes
B15	School technology	C15	Risk Management
B16	Student learning Technology	C16	Admission Processes
B17	Student Account Technology	C17	Faculty Training
B18	Teaching Technology	C18	Work Team processes
B19	Usage of Technology	C19	Documentations
B20	Service Delivery	C20	Committee Processes
B21	Intelligence as a Resource	C21	Quality Assurance processes
		C22	Asset and Finance Management (allocation)
		C23	Publication/Research Processes
		C24	Accreditation Processes
		C25	Programs Formation
		C26	General HRM
		C27	Institutional Strategy Alignment
		C28	Institutional Policies implementation
		C29	Intelligence gathering processes

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Table II.
Main themes for RR model in HEI competitiveness for quantitative validation

D	Other elements
D1	Control
D2	Faculty Rewards
D3	Faculty Retention
D4	Risk Handling Policies
D5	Initiatives building
D6	Curriculum
D7	Measurement of Results
D8	Synergy Building
D9	Leadership
D10	Ext. Resource Alliances
D11	Ext. Processes Alliances
D12	Institutional Quality
D13	Fees and Quality Relation
D14	Transparency

Table III.
Other complimentary factors of RR in HEI competitiveness

measurement model as the model entails conceptualising RR for use in other empirical investigations. The final model that was arrived at has been presented in Figure 2. All absolute and relative fit indices reached significant levels. These included the chi-square statistics ($p > 0.5$), which implied that the model has a good fit. The standardised estimates,

standardized errors, critical ratio, AVE (>0.5) and CR (>0.7) have also presented in Table VII. A total of 12 indicators or items remained as presented in Appendix 5, and the model proved to be highly parsimonious. The covariance table of the main factors in the model showed estimates were below 0.5 in absolute values.

Method biases and statistical power analysis. To use Harman’s single factor technique for the bias test, all 12 variables from every factor in the final CFA model were regressed onto a common factor as recommended by Gaskin (2012c). To ensure that the model is churned, 5 constraints were deployed in the CFA. This alone signifies that the fully constrained model is significantly different from the unconstrained model and no common latent factor risks show that the authenticity of the model has been established.

Statistical power analysis was also conducted to assess the post hoc sample size adequacy. The results have been presented in Table VIII and Figure 3. A partly-constrained model and a fully constrained model were used to generate the chi-square statistic variance for the effect size data using their respective degrees of freedom. This permitted the use of the χ^2 test of variance in the G-power program as a part of the statistical power analysis.

The output results presented indicate that the power stands at 96.1 per cent and the original sample used for the empirical observation in study two is, therefore, more than adequate to avoid the commitment of type two errors where the observation may indicate results that are actually false in reality.

Discussion. The five main factors that serve as the output of the CFA have been discussed and labelled accordingly below. It is important to emphasise that the survey questionnaire principally observed the extent to which any stated resource or business process combined with another aspect of the institution to drive competitiveness.

Exploratory factor analysis factor 1. Under Factor 1, there were three main indicators; asset and finance management (C22), publication and research process (C23) and accreditation process (C24) with factor loadings of 0.72, 0.81 and 0.77, respectively. Viewed in the context of non-educational institutions, accreditation processes were themed with affiliation processes. Finance management as a process focussed on the distribution of financial resources to the various areas of the institution.

Furthermore, as supported in literature, support for research and institutional marketing communications as the key to competitiveness have both been established as key themes

Table IV.
Summary of
descriptive statistics
– study two

	<i>N</i> valid	Mean	Std. error of mean	SD	Skewness	Kurtosis
Resources	334	4.7149	0.03863	0.70598	–0.813	0.684
Processes	334	4.9672	0.03518	0.64289	–0.733	0.185
Complements	334	4.8278	0.03862	0.70575	–0.478	0.573
Notes: <i>N</i> = 334, Standard Error of Skewness = 0.133, Standard Error of Kurtosis = 0.266						

Table V.
KMO and Bartlett’s
test – EFA – study
two

Kaiser-Meyer-Olkin measure of sampling adequacy	0.804
<i>Bartlett’s test of sphericity</i>	
Approx. chi-square	6,005.658
Df	666
Sig.	0.000

Factor	Initial eigenvalues			Extraction sums of squared loadings			Rot. sums of squared ^a
	Total	% of Var	Cum. %	Total	% of Var.	Cum. %	Total
1	7.530	20.352	20.352	2.252	6.087	6.087	6.891
2	3.487	9.424	29.776	6.935	18.744	24.831	2.914
3	3.135	8.472	38.248	2.169	5.862	30.693	2.393
4	2.200	5.947	44.195	2.928	7.913	38.606	3.366
5	1.912	5.167	49.362	1.578	4.266	42.872	2.698
6	1.798	4.858	54.220	1.487	4.019	46.891	1.949
7	1.730	4.675	58.895	1.381	3.732	50.623	1.989
8	1.456	3.935	62.830	1.014	2.742	53.364	1.670
9	1.339	3.618	66.448	1.005	2.717	56.082	1.712
10	0.930	2.514	68.962				
11	0.847	2.288	71.250				
12	0.791	2.137	73.387				
13	0.744	2.011	75.398				
14	0.692	1.871	77.269				
15	0.656	1.772	79.041				
16	0.581	1.572	80.613				
17	0.553	1.495	82.107				
18	0.543	1.468	83.575				
19	0.534	1.444	85.019				
20	0.505	1.364	86.383				
21	0.462	1.249	87.632				
22	0.434	1.174	88.806				
23	0.430	1.161	89.967				
24	0.408	1.104	91.071				
25	0.368	0.994	92.065				
26	0.352	0.950	93.015				
27	0.333	0.901	93.915				
28	0.313	0.845	94.760				
29	0.311	0.840	95.600				

Table VI.

Total variance
explained – EFA –
study two

Notes: ^aExtraction Method: Maximum Likelihood. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance. Only 29 factors reported

(Keeling *et al.*, 2007; Asif and Searcy, 2014; Agarwal, 2006). Assets and finance management loaded together with research and publication processes signify the need to strengthen the association between funds and the core organisational processes. According to Asif and Searcy (2014), research capabilities are a major dimension of performance excellence in HEIs and they are embedded in the research infrastructure, teamwork and finance among other organisational capabilities.

The accreditation processes were observed as one of the most important business processes. Viewed in terms of organisational affiliations as related to certifying bodies, this theme was mainly highlighted as a challenging process that hinders the competitiveness of HEIs. Many studies have highlighted that accreditation is a major contributor to the selection of HEIs, including the observation of Ahmad and Hussain (2017) on the factors that determine the students' choice of HEI in UAE.

Exploratory factor analysis factor 2. Factor 2 in the original EFA was reduced to two indicators and these were mainly indicators for business processes. These indicators were process automation (C7) and database management (C8), respectively; both indicators were under the management of technology to achieve competitiveness. It is important to note that

Modified Measurement Model – CFA – Study Two

Goodness of Fit Statistic	P = 0.100	CFI = 0.989
Chi Square = 56.376	NFI = 0.955	AGIF = 0.951
df = 44	TLI = 0.984	RMSEA = 0.029
Cmin/df = 1.281	GFI = 0.972	RMR = 0.068

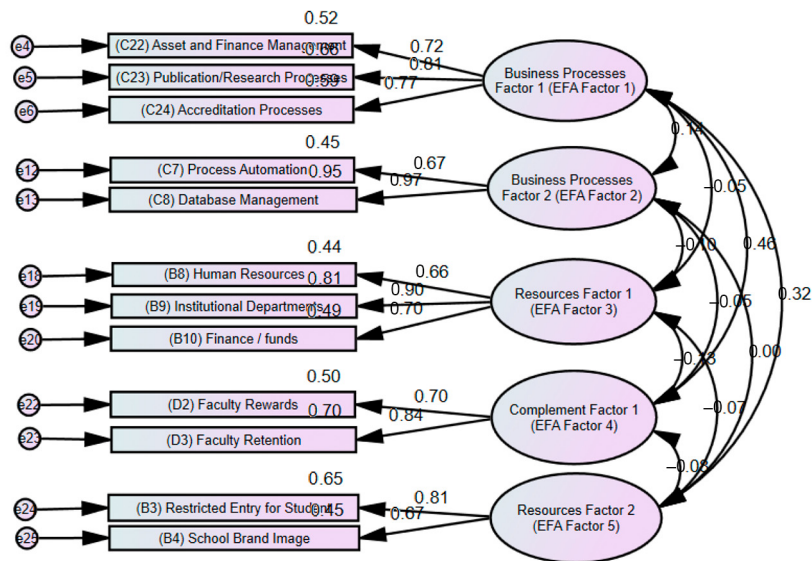


Figure 2.
Modified
measurement model –
CFA – study two

Table VII.
Standardized
estimates, AVE and
CR – CFA – study
two

			Estimate	S.E.	C.Rat	P	AVE	Com R.
C22	←	Business	0.723				0.59	0.81
C23	←	Processes 1	0.81	0.08	12.422	***		
C24	←	(Factor 1)	0.767	0.078	11.671	***		
C7	←	Business	0.672				0.70	0.82
C8	←	Processes 2	0.973	0.621	2.393	0.017		
		(Factor 2)						
B8	←	Resources 1	0.664				0.58	0.80
B9	←	(Factor 3)	0.901	0.117	10.374	***		
B10	←		0.7	0.092	10.844	***		
D2	←	Complements 1	0.704				0.60	0.75
D3	←	(Factor 4)	0.839	0.191	6.695	***		
B3	←	Resources 2	0.809				0.55	0.71
B4	←	(Factor 5)	0.671	0.195	3.711	***		

little reference has been made to system automation in the literature. Mbengo and Chinakidzwa (2014) mentioned that when there is a replacement of labour with automation, an overall improvement in productivity is observable. Schilke (2014), Teece and Pisano (1994) and Teece *et al.* (1997) are among other studies with a bold reference to systems automation in the general strategic management literature.

Database management is also a major aspect of technology management as explained by Asif and Searcy (2014). It is, therefore, easy to accept and rationalise that these two indicators should be loaded together onto a single construct. Asif and Searcy (2014) mentioned that database management is an integral part of how well research performs as well the design and delivery of any associated programs. Helgesen (2008) added that databases are key for the management of internal customers and external strategic alliances.

Exploratory factor analysis factor 3. Factor 3 was reduced to three indicators. These included human resource (B8), institutional or departmental faculties (B9) and funds or finance as a physical resource (B10). These are the fundamental areas of the existing resources as they recorded very high scores and had the most coded segments from the interviews in the qualitative study. Lecturers and other human resources are the main source of success for HEIs. It is, therefore, important to pay careful attention to their needs to make sure that they are satisfied (Mbengo and Chinakidzwa, 2014; Helgesen, 2008).

Funds and finance management mostly share common sources with asset-finance as a business process in institutions (Keeling *et al.*, 2007; Asif and Searcy, 2014; Agarwal, 2006). Encouraging workers to take initiatives and to further maintain a culture of initiative in organisations has been observed as essential to overall organisational performance effectiveness (Detert *et al.*, 2000). Maintaining departmental initiatives in organisations builds on the financial support related to the general human resource capital. Human resource initiatives also remain central to overall organisational innovation capability development (Detert *et al.*, 2000).

χ^2 tests – Variance: difference from constant (one sample case)		
Analysis	Post Hoc: Compute achieved power	
Input	Tail(s)	Two
	Ratio Var1/ Var0	1.333
	α err prob	0.05
	Total Sample Size	334
Output	Lower Critical χ^2	284.3394
	Upper Critical χ^2	385.4476
	Df	333
	Power (1 - β err prob)	0.9605116

Notes: The partly constrained model $\chi^2 = 28.927$, $df = 33$ and the fully constrained model $\chi^2 = 56.373$ 4, $df = 44$; variance of chi-square statistics = $2 * df$

Table VIII.

Statistical power test
details – study two

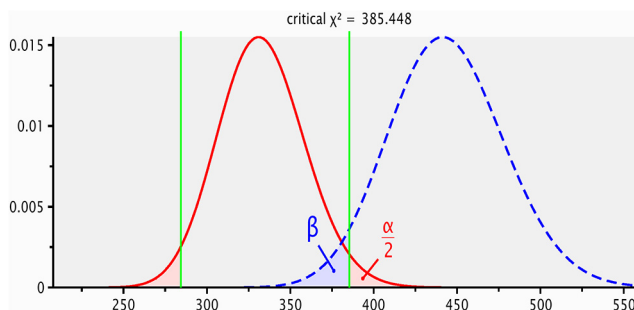


Figure 3.
Central and non-
central distributions
for statistical power
tests – study two

Exploratory factor analysis factor 4. Factor 4 had two main indicators, which were considered to be complementary to resources and business processes in RR. These entailed faculty rewards (D2) and faculty retention (D3). Transferred into non-educational organisations, this implies the need to take care of mainstream staff to retain them throughout the reward schemes.

Irrespective of the sector, rewards and retention are considered to be two major indicators that are used together to improve organisational performance and excellence (Mbengo and Chinakidzwa, 2014; Sharmila, 2013). Sharmila (2013) added that retention rate and the effective management of talents contributes immensely to the performance of institutions and that it offers many benefits. It must be noted that rewards may go beyond financial packages to include vacation, appraisals and other non-monetary rewards. This factor, therefore, does not conflict with Factor 3 on financial support for human resources but it does support the former.

Exploratory factor analysis factor 5. Factor 5 mainly consisted of resource elements and it also consisted of the indicators related to restricted entry concerning student intake (B3) and institutional brand image (B4). In every industry, creating emotional and rational brand relationships is essential to retaining a competitive edge (Bauer *et al.*, 2007) and it is classified as a key driver of continued and insatiable demand.

Several studies agree that brand and institutional reputation management assists the organisation in developing positive perceptions about themselves in the view of significant stakeholders (Laamanen *et al.*, 2016; Aspara *et al.*, 2014; Chapleo, 2010; Lowrie, 2007). While university branding is considered by Kallio *et al.* (2016) to have played a role in the insecurity of academic identities, branding remains a key university marketing strategy in acquiring a competitive position and advantage (Vasquez *et al.*, 2013).

Conclusion and recommendation

The overarching conclusion of the study is that RR may be conceptualised in the five main dimensions of:

- (1) asset, research and affiliation processes;
- (2) automated technology management;
- (3) financial support for HR and departmental initiatives;
- (4) mainstream staff rewards and retention; and
- (5) institutional brand image appeal.

Based on Helfat and Peteraf (2003, p. 997), "it is difficult for researchers to fully explain how firms use resources and capabilities to create competitive advantage", the conceptual model proposed in the study moves beyond black box of RR in firms. This study is among the few studies in the resource and competence-based research that implements SEM methods for integrating the multifaceted effects of resource, business processes, and their antecedents, into the model of RR in firms. Hence, this study allows to quantitatively test the systematic linkages among these variables unlike traditional regression analytical approaches (Isobe *et al.*, 2008).

The findings of the study increase the understanding of the organisational factors that influence the occurrence of RR. Thus, this study contributes to RR as a well-established and essential construct in strategic management theory. The study postulates that by incorporating the resources and business processes exposition jointly towards value creation, improves the understanding of the micro-foundations of each capacity.

The study also contributes to the theoretical research from a methodological perspective in the field of RR. While past research has mainly adopted conceptual approaches or few

quantitative approaches (Pavlou and El Sawy, 2011; Kurzhals, 2015). The present study, therefore, sought to improve this unidirectional approach to understanding the RR phenomena by bringing together and interpreting both quantitative and qualitative information collected from both the faculty and head of departments/managers of HEIs, thus providing a bigger picture revealing the antecedents and consequences RR.

It may be added that the study findings contribute to the research on RR by examining its antecedents and consequences in the context of the UAE an under-researched area. Study on RR in the Middle Eastern context relies mostly on the theories derived or based on the Western, European and American research. This phenomenon of theoretical drought, combined with a paucity of research documenting the Strategic Management issues in HEIs, indicates that the management of resources and business processes is one of the most crucial problems faced by higher education as indicated by research. Therefore, the intervention of this research on a Middle Eastern country such as the UAE gives resource integration a global theoretical outlook and of particular relevance to researchers in the Gulf region in drawing out some new theoretical insights.

On the practical side of contribution, the outcome of this study is presumed to assist managers, to understand the influence of resource endowments and resources reconfiguration on everyday resource management practice and to improve organisational efforts for developing RR. Therefore, the industry will be able to have a better understanding of resource value creation in firms to construct a systematic framework to develop RR. Thus, the process of RR in firms would not be a matter of chance, as it happens in today's organization, rather by abiding by the framework in using the systemic initialisation and exploitation of the value creation potential in RR.

Furthermore, the focus of this study specifically on HEIs raises methodological and application issues that cannot be ignored, and hence, it presents challenges with regard to the generalisability of the study to other sectors. Noting that sectors may be highly diverse with regard to resources and processes considerations, it is in the right direction that the study was narrowed down to a single sector. A manufacturing entity or a trading organisation, for instance, may have more resources than processes. Likewise, the focus of resources and processes may not exactly align as observed in the present study. It was, however, justified that HEI remains at the core of knowledge creation and assimilation. Focusing on this sector to conceptualise RR was therefore considered to be the most suitable.

Based on the perspective of organisational behaviour, Hawass (2010) proposed that future research should explore the patterns of managerial leadership styles to see if they are supportive of resource reconfiguration. Future research may conduct case studies on successful leaders that have been considered to reconfigure their firm's assets. Others may build on the current model across educational and non-educational industries and sectors. This will help to refine and arrive at a cross-sector model of RR, which can be adapted in diverse sectors for empirical observations.

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Appendix 1. Interview Guide-Study one

Section A: Exploring New and Existing Resources and Business Processes

Q1. Please offer examples of Existing Resources that add to institutional competitiveness.

Resources are internal resources that have been within the institution for a long time. Both tangible and intangible resources are welcomed.

Q2. What are some of the New Resources that contribute to institutional competitiveness?

New resources entail external assets and connection that have recently been acquired. Both tangible and intangible resources are welcomed.

Examples: Resources, whether existing or newly acquired can be in the forms of strong financial backing as an institution, assets in the form of land, building and space, strong faculty reputation, Strong Alumni association, new departments, new courses, Associations with international accreditation bodies or agencies etc. These resources must be highly relevant such that it makes the institution competitive.

Q3. What are some of the Ongoing Business processes that drive competitive advantage of your educational institution?

Q4. What are some of the New Business processes/initiatives that drive competitive advantage of your educational institution?

Examples: Business processes, whether ongoing or new can be in the forms of teaching style, treatment of faculty members, student selection process, educational initiatives, new department grooming process, new course offering processes, course development process etc.

Section B - Exploring Inter-Relationships

This section follows up on some of the examples mentioned in the previous section.

Example: Considering “financial capital” was mentioned as a key competitive resource and “teacher training” was mentioned as an existing business process [...] the question becomes “how do financial capital enhance teacher training programs?” Other questions follow in this manner [...]

Combining Resources with Business Processes:

Q5. Please elaborate on how existing resources drive ongoing business processes in your educational institution?

Q6. Please explain how new resources drive ongoing business processes in your educational institution?

Q7. Please elaborate on how existing resources drive new business processes/initiatives in your educational institution?

Q8. Please explain how new resources drive new business processes/initiatives in your educational institution?

S/N	Statement	1	2	3	4	5	6	7
<i>Section A: resources</i>								
B1	Students complement other resources and processes in my institution							
B2	Alumni connectedness complements institutional competitiveness							
B3	Restricted entry for students complements competitiveness of my institution							
B4	School brand image makes the institutional brand stand out							
B5	Software makes tasks and processes easier in my institution							
B6	Accreditation complements institutional competitiveness							
B7	School equipment makes us stand out as an institution							
B8	The nature of Human resources we have makes us unique and competitive							
B9	Institutional departments make the performance of other special processes easy to execute							
B10	Finance/funds provide an avenue to stand out among other institutions							
B11	The infrastructure of the school provides room for other resources and processes towards competitiveness							
B12	Faculty HR recruitment procedures contributes to institutional competitiveness							
B13	Non-Faculty HR such as finance and facility management directors add to the institutional competitiveness							
B14	HR promotions generally complement other resources and processes towards achieving competitiveness in my institution							
B15	School technology makes us stand out as a higher educational institution							
B16	Student learning Technology facilitate performance of lecturers' duties and other processes towards competitiveness							
B17	Student account Technology complements transactions and process efficiency							
B18	Teaching technology facilitates learning and makes my institution stand out from the competition							
B19	Usage and application of technology complements other resources and processes towards achieving competitiveness in my institution							
B20	Service delivery complements other resources and processes towards achieving competitiveness in my institution							
B21	Intelligence as a resource complements other resources and processes towards achieving competitiveness in my institution							
<i>Section B: business process</i>								
C1	Technological processes add value to other resources and processes towards achieving competitiveness in my institution							

(continued)

Table AI.
Survey
questionnaire-study
two

S/N	Statement	1	2	3	4	5	6	7
C2	Teaching processes are vital to the institution in its competitive endeavours							
C3	Collaborative processes complement other resources and processes towards achieving competitiveness in my institution							
C4	The student application processes we use adds value to us as an institution							
C5	Registry processes complement other resources and processes in my institution							
C6	Faculty meetings complement other resources and processes in my institution							
C7	Process automation complements other resources and processes towards achieving competitiveness in my institution							
C8	Database management complements other resources and processes towards achieving competitiveness in my institution							
C9	Procurement processes complement other resources and processes towards achieving competitiveness in my institution							
C10	Communication processes complement other resources and processes in my institution							
C11	Internal collaboration complements other resources and processes towards achieving competitiveness in my institution							
C12	Administrative functions complement other resources and processes towards achieving competitiveness in my institution							
C13	Customer service management complements other resources and processes towards achieving competitiveness in my institution							
C14	Exams processes complement other resources and processes towards achieving competitiveness in my institution							
C15	Risk Management complements other resources and processes towards achieving competitiveness in my institution							
C16	Admission Processes complement other resources and processes in my institution							
C17	Faculty Training complements other resources and processes towards achieving competitiveness in my institution							
C18	Work team processes complement other resources and processes towards achieving competitiveness in my institution							
C19	Documentations complement other resources and processes in my institution							
C20	Committee Processes complement other resources and processes in my institution							

Table AI. (continued)

								Conceptualizing and validating resource
S/N	Statement	1	2	3	4	5	6	7
C21	Quality Assurance processes complement other resources and processes towards achieving competitiveness in my institution							
C22	Asset and Finance Management complements other resources and processes towards achieving competitiveness in my institution							
C23	Publication/Research Processes complement other resources and processes towards achieving competitiveness in my institution							
C24	Accreditation Processes complement other resources and processes towards achieving competitiveness in my institution							
C25	Programs Formation complements other resources and processes in my institution							
C26	General HRM complements other resources and processes towards achieving competitiveness in my institution							
C27	Institutional Strategy Alignment complement other resources and processes towards achieving competitiveness in my institution							
C28	Institutional policies implementation complements other resources and processes towards achieving competitiveness in my institution							
C29	Intelligence gathering processes complement other resources and processes towards achieving competitiveness in my institution							
<i>Section C: other RR elements</i>								
D1	Institutional control are vital for competitiveness in my institution							
D2	Faculty rewards is prioritized on the need to remain competitive.							
D3	Faculty retention is prioritized on the need to remain competitive							
D4	Risk handling policies are important elements towards achieving competitiveness in my institution							
D5	Initiatives building complements other resources and processes towards achieving competitiveness in my institution							
D6	Curriculum complements other resources and processes in my institution							
D7	Measurement of results complement other resources and processes towards achieving competitiveness in my institution							
D8	Synergy building complements other resources and processes towards achieving competitiveness in my institution							
D9	Leadership complements other resources and processes towards achieving competitiveness in my institution							
D10	External resource alliances complement other resources and processes towards achieving competitiveness in my institution							
								(continued)

Table AI.

S/N	Statement	1	2	3	4	5	6	7
D11	External process alliances complement other resources and processes towards achieving competitiveness in my institution							
D12	Institutional quality complements other resources and processes towards achieving competitiveness in my institution							
D13	Fees and quality relation complement other resources and processes towards achieving competitiveness in my institution							
D14	Transparency complements other resources and processes towards achieving competitiveness in my institution							

Appendix 3

Conceptualizing
and validating
resource

Factors	Codes	Loadings	AVE	CR
<i>Factor 5</i>				
Restricted Student Entry	B3	0.743	0.470	0.726
School brand Image	B4	0.681		
Software	B5	0.628		
<i>Factor 6</i>				
Accreditation	B6	0.991	0.834	0.909
Equipment	B7	0.828		
<i>Factor 3</i>				
Alumni Connectedness	B2	0.640	0.528	0.813
Human Resources	B8	0.914		
Institutional Departments	B9	0.700		
Finance/funds	B10	0.614		
<i>Factor 7</i>				
Technological processes	C1	0.802	0.409	0.729
Teaching Processes	C2	0.514		
Collaborative Processes	C3	0.567		
Student Application Processes	C4	0.637		
<i>Factor 2</i>				
Process Automation	C7	0.624	0.454	0.802
Database Management	C8	0.572		
Procurement Processes	C9	0.803		
Communication Processes	C10	0.786		
Internal Collaboration	C11	0.541		
<i>Factor 9</i>				
Work Team processes	C18	0.727	0.520	0.675
Documentations	C19	0.701		
<i>Factor 1</i>				
Risk Management	C15	0.8190	0.520	0.922
Committee Processes	C20	0.704		
Quality Assurance processes	C21	0.746		
Asset and Finance Management (allocation)	C22	0.765		
Publication/Research Processes	C23	0.789		
Accreditation Processes	C24	0.743		
Programs Formation	C25	0.705		
General HRM	C26	0.668		
Institutional Strategy Alignment	C27	0.707		
Institutional Policies implementation	C28	0.620		
Intelligence gathering processes	C29	0.638		
<i>Factor 4</i>				
Control	D1	0.726	0.541	0.779
Faculty Rewards	D2	0.761		
Faculty Retention	D3	0.719		
<i>Factor 8</i>				
Initiatives building	D5	0.550	0.465	0.712
Curriculum	D6	0.882		
Measurement of Results	D7	0.560		

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Table AII.
AVE and CR for
EFA

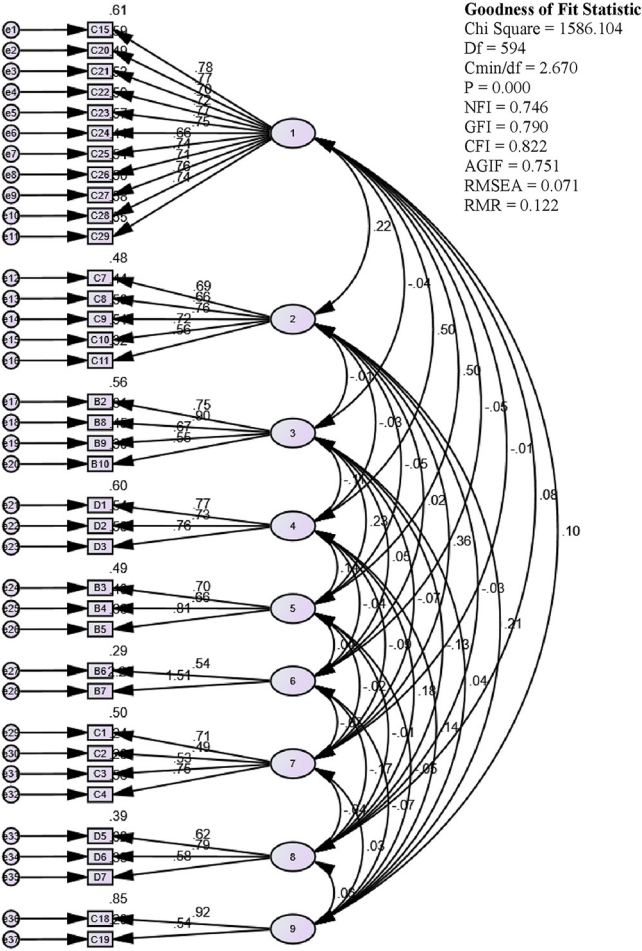


Figure A1.
Initial guided
measurement model -
CFA – study two

RR1	Asset and finance management complements other resources and processes towards achieving competitiveness in my institution
RR2	Publication/Research Processes of my institution helps in building our brand image
RR3	Accreditation improves our ranking nationally and internationally
RR4	Process automation complements other resources and processes towards achieving competitiveness in my institution
RR5	Database management complements other resources and processes towards achieving competitiveness in my institution
RR6	The nature of human resources we have makes us unique and competitive
RR7	We have special Institutional departments that add to competitiveness
RR8	Finance/funds provide an avenue to stand out among other institutions
RR9	Faculty Rewards is prioritized on the need to remain competitive
RR10	Faculty Retention is prioritized on the need to remain competitive
RR11	Restricted entry for high number of student applicants adds to my institutional competitiveness
RR12	School brand image makes the institutional brand stand out

Table AIII.
Final RR items

About the authors

Dilnaz Muneeb is a PhD graduate from Nottingham University Business School, University of Nottingham, Malaysia Campus. She is an Associate Professor of Management at Abu Dhabi University, one of the leading universities in UAE. She has completed her Master and Bachelor's in Business Administration from Abu Dhabi University, UAE. Her research interest lies in Strategic Management, International Business, HRM, Marketing, Knowledge Management, SMEs and Entrepreneurship. She has long teaching experience in the field of Marketing and Management at different universities in United Arab Emirates. She has presented her papers at different conferences as well. Dilnaz Muneeb is the corresponding author and can be contacted at: dilnaz.khan@hotmail.com

Kok Wei Khong is currently the Head of School at Taylor's University School of Marketing. He was the Associate Dean (Research) of the Faculty of Arts and Social Sciences at University of Nottingham, Malaysia Campus. He is an expert in data analytics particularly in the use of Machine Learning (ML) structural equation modeling (SEM), social media analytics and text mining. He has published in many journal publications notably in Information and Management, *Journal of Services Marketing*, Expert Systems with Applications, Supply Chain Management: *An International Journal*, *Industrial Management and Data Systems*, *Journal of Computer Information Systems*, *Journal of Business Ethics and Business Strategy and the Environment*; all of which are notable impact journals. He has worked in many research grants in excess of a million ringgit (70per cent of which are external grants) which relate to business analytics. He has more than 19 years working in academia and conducting research in areas like services marketing, user technology acceptance, social media studies, behavioural science, business analytics, machine learning and process reengineering.

Christine Ennew is a Provost at the University of Warwick where she supports the Vice Chancellor in the academic leadership of the University. A key aspect of her role is leading the development and delivery of the University's academic strategy, ensuring that Warwick remains competitive and relevant within HE and beyond. She is responsible for the efficient and effective use of academic resources (including departmental resources, capital planning and space management and information resources). Christine graduated from Cambridge University and completed her PhD at Nottingham. Until recently she was one of Nottingham's Pro Vice Chancellors, as well as serving as Provost and CEO of the University of Nottingham Malaysia Campus. She joined the University of Warwick in August 2016. She is currently a member of the Advisory Board of the Observatory on Borderless Higher Education, a member of the Board of Directors for Common Purpose Student

Experiences, a member of the Board of Examiners for the Asian Institute of Chartered Bankers and represents the University of Warwick on the Boards of a range of associated companies. She has been actively involved in research in the financial services sector for most of her academic career. She has focused her research on key strategic themes, including service quality and delivery, loyalty and retention, and service failure and recovery and has completed a range of funded projects, most notably in relation to the development of the Trust Index. She has also undertaken business-oriented research specifically in the areas of customer satisfaction, marketing relationships and trust, including on behalf of a number of major banking organizations. In addition to her work on financial services, she is increasingly involved in writing and speaking about the management and marketing of higher education with a particular emphasis on the nature, growth and development of international higher education.

Mohan Avvari is an Associate Professor of Strategic Management and Acting Dean at the Nottingham University Business School (NUBS) in the University of Nottingham – Malaysia Campus (UNMC). Dr Mohan currently undertakes the following administrative roles within the Business School: Deputy Dean, Business Engagement and External Relations; Member, School Management Group; Divisional Research Director – Strategy and Marketing Group, and also Advisor, SIFE and Wall Street Society – University of Nottingham Malaysia Campus. He received his doctorate in Marketing and Innovation from the Department of Management Studies of the Indian Institute of Science (IISc), Bangalore following which he visited South Korea on a Research Fellowship at the Korea Advanced Institute of Science and Technology (KAIST). Prior to joining UNMC, he served as a member of the Faculty of Management at Multimedia University, Cyberjaya, Malaysia. His research interests are in the areas of Strategy and Innovation with Sustainability oriented Strategies (CSR). He is particularly in collaborations or linkages firms develop with other organisations for Innovation and Sustainable Development/CSR. He has served as a Council Member of the Consumer Forum (CFM) for the Malaysian Communications and Multimedia Industry, as a recourse person in WTA-UNESCO workshops and recently as Innovation Auditor for MIGHT, Malaysia. His teaching interests are in strategic management and management of innovation – with particular interest in corporate social responsibility/strategies adopted by firms for sustainability/sustainable development. Currently, he teaches modules on Strategic Management, Sustainable Decisions and Organisations and Management of Innovation in the MBA programme. He has co-taught Marketing Strategy at the masters level and at the undergraduate level taught Strategic Management, Entrepreneurship and Business, New Venture Creation and Marketing Strategy and have co-taught International Business Strategy. His research interests are in the general area of business strategy and innovation- particularly about firms developing capabilities for sustainable strategies and Innovation. His is interested in in inter-organizational linkages firms develop for enhancing innovation and also for developing sustainable/socially responsible strategies. In addition, he is also interested about how firms located in “regional clusters”, develop linkages or form networks for their business strategies and innovation.