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ABSTRACT

This study empirically examines service productivity and complements prior studies by framing service productivity as consisting of a number of key constituents. Adopting a bottom-up approach we present an integrative model proposing that resource commitment is the core from which employee readiness and customer readiness flow. These inform service productivity, which, in turn, informs job security.

Our empirical examination reveals that service productivity has an impact on perceptions of job security, while resource commitment has the greatest impact on both employee readiness and customer readiness. In developing our integrative model we provide a framework that other researchers can apply, particularly where the service is highly intangible or in the public sector where service providers are being increasingly challenged to demonstrate value for money.

Keywords: Services, productivity, higher education

INTRODUCTION

Productivity is at the heart of economic theory underpinning the assessment of performance (Djellal & Gallouj, 2013). An examination of service productivity is not entirely novel and those earlier contributions have served readers well, by stressing traditional service factors, such as service quality or customer satisfaction, as being important for service productivity (Parker, Waller & Xu, 2013).

In presenting our contribution we accentuate the position that the conceptualization and measurement of service productivity comprises: organizational resources (Rodríguez & Rodríguez, 2005); employees (Qammar, Khan & Siddique, 2007); and customers (Kotzé & Plessis, 2003). Other scholars (e.g. Şenol, 2011) have mentioned perceived job security as the outcome of organizational productivity. By presenting an integrative single model we are able to make a contribution because we validate a bottom-up inclusive service productivity model on replicated relationships, resulting in a new incremental contribution. Therefore, the overarching objective of the study presented here is to empirically examine the relationship between the antecedents and corollary of service productivity.

In adding to the existing body of literature we utilize the domain of Higher Education Institutions (HEIs) which is characterized by its highly intangible offering with delivery lacking homogeneity, and, as a service sector, one that is going through change. Our timely examination is warranted given that in most countries HEIs are deemed to be not-for-profit and receive at least some of their income from the public sector (Johnes, 2006) as well as facing an increased demand to justify value for money. In the private sector, service providers are most likely to seek to maximize profits and shareholder value, but for a not-for-profit HEI the key is value creation or improving welfare (Parker et al., 2013). When an HEI's productivity has been evaluated the approach has tended to be based on the research

perspective of the HEI's operations, which, itself, is a limitation. For example, using an algorithm to identify the relationship between research and teaching (Galbraith & Merrill, 2012); by relating social capital and research funding (Salaran, 2010); and by examining research output (Smith, Fox, Park & Lee, 2008).

In addressing our overarching research objective, the rest of our article unfolds as follows. We present the literature and provide a detailed elaboration of the replicated relationships in our model. This is followed by a discussion of our method, with the last sections drawing together our findings as well as focusing on the conclusions and managerial implications.

LITERATURE REVIEW

A basic challenge for services research is to be able to quantify the basic unit of what is being measured, owing to the variety of inputs and outputs, which is further compounded by the intangible nature of services. In relation to productivity, within the service literature there are numerous organization-wide models that are applicable to service delivery; two such examples are the 3Es (economy-efficiency-effectiveness) and the IOO approach (inputs-outputs-outcomes) (Parker et al., 2013). Thus, in essence, service productivity is about measuring the value of the return on investment (Ostrom, Parasuramen, Bowen, Patrício & Voss, 2015). In understanding service productivity, similarly to Jääskeläinen & Lönnqvist (2011) we present a bottom-up approach. This allows us to present service productivity from an operative perspective and, therefore, we suggest there are a number of relationships that together warrant a deeper understanding of service productivity.

Resource Commitment and Service Productivity

Resources are central to operations and can be referred to as operant and or operand (Vargo & Lusch 2008). Resources used within HEIs include physical facilities (ICT technologies, libraries, and audio-visual aids), human resources (well-trained faculty members, managers, and support personnel), and fiscal resources (financial aid, endowments, and research funds) (Astin, 1999). These resources are productive assets and, as such, their scarcity necessitates the development of different strategies that are efficient and effective. This concurs with the view that is founded on the premise that the management and utilization of valuable resources are central to attaining a competitive market position in the service sector (Guchait & Cho, 2010).

The return on resources is dependent on the extent to which they are committed towards organizational activities. Hunt (2000) refers to this as resource commitment and contends that the allocation of tangible and intangible resources at the firm's disposal facilitate an efficient and effective offering. Resource commitment, therefore, is the apportionment of resources to maximize productivity (Yalley & Sekhon, 2014). This means that organizations which commit and manage their resources appropriately are more likely to enjoy superior performance as a consequence of an improvement in their production process and consequentially productivity (Chun, Shin, Choi & Kim, 2011). Consistent with the resource theory contention that if sufficient resources are allocated and managed within HEIs, productivity and performance will be enhanced through student learning and development (Hazelkorn, 2007; 2008).

Employee Readiness and Service Productivity

The labor-intensive and co-production nature of services brings into focus the importance of service employees as part of service productivity delivery, particularly within

the Higher Education (HE) sector. The role of employees remains central to the success of service delivery with an emphasis on the employee/customer relationship (Bowen, 2016). In this regard the employees' importance in services has been associated with efficiency, effectiveness, service quality, productivity, and profitability (Yi, Naataraajan & Gong, 2011).

Considering the importance of employees and the co-production nature of HEI service delivery, an understanding of the factors that can induce employees to perform better is paramount. Several studies have been undertaken to comprehend the factors impacting on employee behavior towards the attainment of organizational goals and objectives, particularly from the human relation and organizational studies disciplines; these studies have related this to employees' attitudes and behaviors in the workplace, and conceptualized this as "employee readiness" (Bernerth, 2004). Extending these principles to the HEI's service delivery process and its co-productive nature, employee readiness is essentially employees' state of preparedness to perform their service-related task successfully with other co-producers. Thus, employee readiness and productivity are intertwined (Nasr, Burton, Gruber & Kitshoff, 2014)

Some scholars (e.g. Jääskeläinen & Lönnqvist, 2011) identified different factors as affecting the level of employee readiness, for example, employee demographic factors; experience, skills, and knowledge on the job; motivation; social relationships in the workplace; and culture, among others. Additionally, several studies have identified a link between employee readiness and employee attitude and behavior in the workplace (e.g. Chen & Huang, 2009), as well as its relationship with employee performance and productivity (McClellan & Collins, 2011).

In understanding the factors affecting employees' readiness, the committal of resources towards human resource development has been associated with employees'

willingness to work effectively towards the attainment of organizational objectives (Guchait & Cho, 2010). Utilizing theories of social exchange, motivation, and the norm of reciprocity (e.g. Blau, 1964) organizations committing resources towards activities aimed at developing and preparing their employees are most likely to witness a positive impact on employee attitude and behavior towards work (Salanova, Agut & Peiró, 2005). This committing of resources also resonates with employee citizenship behaviors (Babcock-Roberson & Strickland, 2010). Further, employee citizenship behavior is analogous with an organization's outcomes and performance (Spector & Fox, 2010) and there is a positive relationship between employee behavior, productivity, and performance (Kehoe & Wright, 2013).

Productivity in HEIs, therefore, is dependent on the readiness of academics in performing and co-producing services with students and other stakeholders. This entails the committal of organizational resources towards the development of academic skills and knowledge, and the extent to which academics are motivated and socialized within their institutions, departments, and teams.

Customer Readiness, Resource Commitment and Service Productivity

Recent changes in HEIs globally have gone some way towards recognizing students as customers and as such the beneficiary of the service encounter (Woodall, Alex & Resnick, 2014). Customer/student participation during service co-production, particularly in HEI teaching and learning, is commonplace because as Vargo and Lusch (2004a; 2004b) contend in service *per se* it is due to the inseparable nature of the service delivery process. For this reason customer importance and impact during service co-production have been recognized and studied (Lusch, Vargo & O'Brien, 2007). This has led to recognition of customers as partial employees in higher education (Cleghorn, Kruger, Nosal, Oleksiuk, Schulz, Tolly & Griffin, 2014) as well as the identification of customers as value co-producers, value co-

creators/destroyers, and productivity enhancers. This viewpoint concurs with Bitner, Faranda, Hubbert and Zeithaml's (1997) assertion that the customers' role as co-producers can either enhance or detract value and satisfaction, as well as impact on organizational productivity and quantity of outputs.

In this respect, students' behavior during the teaching and learning process is of fundamental significance. Several scholars have related this to customer readiness and described it as a customer's state of mind or predisposition towards something (Meuter, Bitner, Ostrom & Brown, 2005). The lens of customer readiness is on the students' role during teaching and learning, and on their state of preparedness to perform their co-production role successfully. And, as Spohrer, Maglio, Bailey, and Gruhl (2007) contend, customer preparedness is imperative for determining the outcome of services, and the better prepared customers are, the greater the likelihood that expectations will be met. Students' motivation, role clarity, and ability characterize the customers' level of readiness (Hibbert, Winklhofer & Temerak, 2012).

Students' readiness, conversely, depends on an HEI's commitment of resources to customer recruitment, selection, and management. Taken together, the inference is that HEIs that commit resources have a reciprocal effect on their students' behavior and performance. Therefore, HEIs committing resources to students' development and learning have a positive impact on students' ability, role clarity, and motivation to contribute to the delivery of teaching and learning and, subsequently, productivity. Thus, for our domain, students' preparedness prior to entering higher education and during the course of their studies significantly impacts on retention rates and productivity of HEIs.

Service Productivity and Perceived Job Security

For services, the output is more intangible than in a manufacturing setting and, consequently, it is more problematic to quantify the output (Jääskeläinen & Lönnqvist, 2011). The competitive nature and increasing government and other relevant stakeholders' regulation of the HE sector have led to an instance transformation of most HEIs. In all these instances, employees are among the various stakeholders directly impacted, and an employee's concerns regarding job security can have a wide range of profound repercussions, including occupational health and social, managerial, and organizational implications, as well as implications for an employee's physical and mental wellbeing, motivation, job satisfaction, and performance (Şenol, 2011).

Job security is related to an employee's expectation regarding employment continuity (Cuyper, Witte & Nätti, 2010) or the perceived stability and continuance of employment. Taking into consideration the various discussions, employees are more likely to make inferences regarding their job security based on their perceptions of productivity (Loi, Ngo, Zhang & Lau, 2011). For instance, increasing media reports, annual reports, departmental reports and internal memos, and gossip on institutional productivity and performance are probably the triggers for employee concerns regarding job security. Therefore, an employee's perceived job security is not only inferred from labor market conditions but also from productivity (Westover, Westover & Westover, 2010), hence we postulate that when an HEI is efficient and effective in delivering teaching and learning, research, and other service-related activities, greater job security, as perceived by the employee, increases.

RESEARCH MODEL

Synthesizing the preceding elaborations we present our proposed research model in Figure 1. We propose that positive perceptions of (a) resource commitment; (b) employee readiness; and (c) customer readiness act as the antecedents of service productivity, with perceived job security as its corollary.

Take in Figure-1 about here

As identified in an earlier discussion point, the contribution set out here is timely because in most countries the HEI sector receives at least some of its income from the public sector, thus the significance of understanding productivity (Johnes, 2006). Moreover, when the dimensions of service productivity are well understood, this knowledge can have a positive impact on productivity and performance (Newton, Becker & Bell, 2014). Therefore, by using a replication approach at the construct relationship level we develop and evaluate an inclusive overall model. Thus, we present the following replications:

R1: Resource commitment positively influences service productivity.

R2: Resource commitment positively influences employee readiness.

R3: Employee readiness positively influences service productivity.

R4: Resource commitment positively influences customer readiness.

R5: Customer readiness positively influences service productivity.

R6: Service productivity positively influences perceived job security.

RESEARCH METHODOLOGY

To empirically understand the relationships within our model we root our work in cross-sectional survey data collected from academics working in numerous HEIs in the United Kingdom (hereafter, UK) Australia/New Zealand (hereafter, Aus/NZ), and India, and with sample members derived from a mixture of research and non-research-intensive institutions. By utilizing a broad range of HEI types, we are able to overcome of the prior research to which we allude, during the introduction. It means that by adopting the aforementioned approach and despite the study having aspects of replication, Eisenhardt & Graebner (2007) contend it is possible to better validate a theory so that it is more accurate and generalizable.

Scale Development

Our theoretical model replicates relationships that previously exist between the constructs, while the model in its entirety is new. Even though there is a degree of replication between the relationships, a robust approach was used to generate the items for our study (see Churchill, 1979). While our practical contribution is to the HEI domain, it would have been naive to assume that the extant literature in the HEI domain should be the exclusive and ideal root literature for our study. Hence, for scale development purposes, the general extant literature was systematically reviewed and codified from multidisciplinary perspectives to allow the identification of more than 100 relevant items against which to measure our perceived antecedents and the outcome of service productivity. These items were critical in allowing us to fully capture the dimensionality of our theoretical framework, and the approach taken increases the validity of our research (DeVillis, 1991).

Following the initial identification of the 100+ items, two subject academics (unconnected with the research and at the researchers' host institution) undertook a review of the items with duplicates removed and new ones created where there was similarity in the item stems. We used two subject experts for the initial identification because of the other steps (discussed next) being taking to support our scale development, with the additional steps acting as further checks. Following an initial review of the items, a card-sort exercise was completed with 10 academics to refine the scale items, and as part of the exercise, short semi-structured interviews were completed with the sample members. The purpose of the card-sort exercise was to see how the items were interpreted in relation to the constructs within our theoretical structure, and whether the interpretations of items were clear. When developing new scales, other researchers (see Sekhon, Ennew, Kharouf & Devlin, 2014) also adopted a similar card-sort exercise.

In completing the card-sort, the cards (showing the item stems) were randomly shuffled and each participant was asked to place the card against one of the constructs in our theoretical framework. In the next stage, participants were asked to rank the cards relative to how strongly they felt each card related to that construct. Thus, the card placed in first position was most strongly related followed by second place and so forth. Only the cards placed in either first or second place (rated highly) frequently were deemed to be aligned with that construct. The approach adopted by us is consistent with Sekhon et al. (2014) in identifying the most relevant items from a card-sort to include in the next stage.

The semi-structured interviews served the purpose of ensuring that we had considered the various constructs that could inform our theoretical framework, and serve as a cross-check of the relevance of each. Combined, the outcome of the card-sort and semi-structured interviews was support for our theoretical structure.

The corollary of the aforementioned activity was the establishment of 22 relevant items. Once identified, the scale items were anchored at '1 = strongly disagree' and '5 = strongly agree' with point 3 anchored as neutral. No anchors were applied to points 2 and 4 of the scale.

Pilot Survey

After the relevant items had been established, a pilot study was undertaken. The methodological approach for the pilot study was the distribution of questionnaires to academics at an international conference (The Academy of Marketing Conference) which is under the broad heading of 'business and management'. Although the conference with business and management academics was held in the UK, it had delegates from almost 50 countries. Given the transnational nature of our work, the inclusion of a variety of countries helped to act as a further check on our research instrument.

The pilot study resulted in 143 usable questionnaires being returned. As part of the pilot, sample members were given a pre-paid envelope to return the questionnaires, but no inducements to complete the survey were provided.

The returned pilot survey questionnaires were subjected to analysis. At this stage we were not evaluating our theoretical structure, so the data were subjected to an exploratory factor analysis using principal component analysis and varimax rotation. After two sequences of factor analysis, resulting in the deletion of three items, the final factor analysis identified the degree of variance among the remaining 19 items as being meritorious, with a Kaiser-Mayer-Olkin (KMO) index of $>.80$ and Bartlett's test of sphericity significant at ($\chi^2(276) = 3223; p < .001$). Communalities were good, ranging from .620 to .893, with overall reliability of .938. Subsequently, these were rotated using the varimax method, and the remaining 19

items loaded as expected. Table 1 details the final items and their loadings EFA in relation to the constructs (space restrictions preclude us from full reporting here).

Take in Table-1 about here

Main Survey

To administer our survey, the instrument was distributed using a snowball sampling approach to HEI academics in India, Aus/NZ and the UK. The use of snowball sampling had its benefits for the type of research that we undertook, because it allowed us to gain access to a wide range of academics through an approval approach; academics who may otherwise have been out of reach. As a survey method, Faugier and Sergeant (1997) suggest that snowball sampling is an acceptable methodology for drawing conclusions.

The survey instrument was administrated through web-based survey, using the KwikSurveys website. We utilized a web-based survey over a more traditional paper-based approach because of (a) the geographic reach; (b) faster response times; and (c) financial advantages achieved over a paper-based approach (see Green, Johnson & Neal, 2003; Göritz, 2004). In total, 583 usable surveys were returned of which $n=163$ were from India, $n=177$ from Aus/NZ and $n=243$ from the UK. We were mindful that a different method was used for the main survey, which was web-based, and the pilot survey, which was paper-based. An online survey, as used for our main data collection, will produce comparable results with those from a paper-based survey (Deutskens, Ruyter & Wetzels, 2006), therefore equivalence is maintained between our pilot survey and main survey. While an online and paper-based survey are likely to yield similar results, there may be some minor differences, for example

more in-depth responses with an online survey than a paper-based survey, which might be because the online forum provides enhanced anonymity (see Deutskens et al., 2006). However, because our study does not include open-ended responses, such anomalies did not arise.

FINDINGS

We adopted Anderson and Gerbing's (1988) two-step approach, using χ^2 , df and χ^2/df to assess our model and Hu and Bentler's (1999) recommendations for reporting the CFI, TLI, IFI, NFI and RMSEA. The overall data for the SEM analysis were split-sampled into calibration and validation data, for testing the stability of the measurement model (Schumacher & Lomax, 2004). We first report the measurement model, followed by the structural model.

The measurement model was evaluated using the calibration data ($n=292$). At the aggregated level, and based on a random selection of sample members from the three countries, this resulted in $\chi^2=610.8$; $df=142$; $\chi^2/df=4.32$; $CFI=.95$; $TLI=.94$; $IFI=0.94$; $NFI=0.93$; $RMSEA=.07$. This was cross-validated using the validation data ($n=291$). The results of both the calibration and validation data resulted in an acceptable fit, thus indicating the modified measurement model's stability. From there, we proceeded to an individual country SEM analysis of the structural model. Table 2 reports the full goodness-of-fit statistics.

Take in Table 2 about here

Results of the Measurement Model

Table 3 shows the co-linearity index. In addition, our measurement model demonstrated a very strong convergent validity, with all factor loadings and SMC (R^2) values ranging from .85 to .99, and .72 to .98, respectively, further indicating the robustness of our model. The average variance extracted (AVE) and composite reliability measures were $\geq .50$ and $\geq .70$, respectively (Hair, Black, Babin, Anderson & Tatham, 2006). The measurement model results are shown in Table 4. In addition, all AVE estimates were larger than their corresponding squared inter-construct correlation (SIC) estimates, showing that the indicators have more in common with their respective constructs than with the other constructs in the study domain. Therefore, the measurement model demonstrates high reliability and internal consistency, as well as strong convergent and discriminant validity and the absence of multicollinearity (Fornell & Larcker, 1981).

Take in Table 3 about here

Take in Table 4 about here

Results of Structural Model

The individual country SEM analysis of the structural model, as reported in Table 5, resulted in an acceptable fit for all the different countries in our study and at the aggregate level, hence allowing us to report on our model. As part of the process, we tested four

alternative models, but none fitted better and as a result our proposed model was identified as the most parsimonious model. In addition, from Table 3 all the endogenous variables have $R^2 > .50$ indicating that the theoretical model explains a significant and substantial variance in the model. Given the goodness of our structural model for the countries in our study, we proceeded to test our research replications. All the replications were supported and significant across all the three countries ($p < .001$ and $p < .05$) with the exception of R1 (resource commitment \rightarrow service productivity), which was supported and significant at ($p < .001$) and ($p < .05$) in the UK and India, respectively, while in Aus/NZ it was not significantly supported. Additionally, the paths resource commitment \rightarrow employee readiness and customer readiness, as well as service productivity \rightarrow perceived job security (R2, R4 and R6 respectively), have the greatest impact across all the countries, while the other paths (R1, R3 and R5) revealed medium strength across all the three countries, with the exception of R1, which was not significant for Aus/NZ.

Take in Table 5 about here

In undertaking empirical research we identified some of the perceived antecedents, and corollary, of productivity. Emergent from our research is unequivocal evidence that the six relationships were supported by path analysis; furthermore, the findings provide directions for the possible development of HR practices to inform service productivity.

The relationship between resource commitment and service productivity reveals that the allocation of resources enhances perceptions of productivity; these findings accord with earlier works (see Richey, Genchev & Daugherty, 2005). A noteworthy finding is that the path between resource commitment and service productivity was not significant in Aus/NZ.

Our research shows that resource commitment is positively related to employee readiness. Hence, when intangible and tangible resources are allocated to their activities it helps improve an employee's preparedness to perform their business school-related tasks successfully with other co-producers (more often than not, the student). This finding is consistent with theories of social exchange, motivation, and the norm of reciprocity (e.g. Blau, 1964) and the findings of other literature examining the impact of organizational resource commitment on its human resource development, and an employee's willingness to work towards the attainment of objectives (see Chew & Chan, 2008).

The empirical results of our study reveal that employee readiness has an impact on service productivity. This establishes that when employees are prepared and willing to perform their service-related task with other co-producers, productivity increases. Other scholars have also demonstrated the relationship between employee behavior and productivity (Alfes, Shantz, Truss & Soane, 2013), and have highlighted the importance of employees in service firms and how employee recruitment, selection, development and socialization can impact organizational productivity.

Our findings support the link between resource commitment and customer readiness, thus affirming the view that when service firms allocate intangible and tangible resources towards their activities and the development of their customers' resources, the customers' level of preparedness is improved. This finding suggests that firms which treat their co-producing customers as partial employees (customer resources), by investing in them in similar ways as their employees, improve their effective participation during the service co-production process. The finding is consistent with other literature which identified a positive relationship between customer behavior and organizational productivity (e.g. Kotzé &

Plessis, 2003). Therefore, productivity levels in service firms can be improved if customer readiness is developed and ameliorated.

Finally, the association between service productivity and perceived job security was supported, confirming that when a service firm is perceived to be productive it positively informs perceived job security. Our findings conform with the general principles of “cycle of success” and “cycle of failure” (e.g. Schlesinger & Heskett, 1991), by identifying the relationship between service productivity and an employee’s perceived job security.

CONCLUSION and MANAGERIAL IMPLICATIONS

The overarching objective of this work was to present an inclusive service productivity model and to empirically examine the relationships between the antecedents and corollary. The empirical findings reveal that service productivity is determined by the extent to which service organizations are willing to commit adequate and appropriate resources to activities, and the extent to which employees and customers are prepared to co-produce services. An interesting finding emerging from our empirical work is the identification of the customers’ role and impact on productivity in services.

Our work identified customer motivation, preparation, and co-operation as core factors defining customer readiness to co-produce services with other co-producers, and further identified the customer role as impacting service productivity. These findings differ from previous contributions, which have relied predominately on the traditional/manufacturing-based productivity concepts, by identifying the impact of customers on the productivity of service firms. In addition, this research extends the traditional productivity concept, which limits productivity gains to organizational and customer value/satisfaction to include all organizational stakeholders, including employees,

society, and government. Therefore, a firm is deemed to be productive only when all of its stakeholders are satisfied with the performance and behavior of the organization.

Given that most HEIs have more than research as part of their *raison d'être*, a focus on research alone is an impediment while HE practitioners are being challenged to demonstrate value for money (Johnes, 2006). In managing productivity, the key seems to be the extent to which resources are allocated to tasks. We contend that this does not mean the wholesale allocation of resources, but instead clearly defined resources that yield a defined return on the investment. In a practical context it may mean the extent to which resources are allocated to make sure that students are prepared adequately at the point of entry. This could mean pre-sessional or immersion-type courses, such as foundation courses for those students who may need bridging to ensure a seamless transition from one course to the next (Copland & Garton, 2011; Green, 2007) and, as a result, to help deliver a reduction in the attrition rate. It may also mean that prior to course enrolment, students could undertake other tasks, such as online enrolment, and have access to reading materials and course tutors, along with other materials and resources that would prepare them for part of their enrolment and subsequent study, although Sadler (2011) argues to the contrary there is merit in early feedback for example informative learning (e.g. Wingate, 2010). The resources provided could go so far as to enable students to undertake formative assessment prior to beginning their studies so that they receive feedback from the start. Thus, the transition from school/college to HEI-level work would be managed in a smoother manner, with students understanding expectations earlier. In combination, this could be part of an induction program for students which could start earlier than the traditional first week of term.

For us, an important finding was that the path between resource commitment and service productivity was not significant in Aus/NZ. We believe that one of the reasons for the

relationship not being significant might be the Performance-Based Research Fund (PBRF) model that was introduced in 2003 in New Zealand. The intended outcome was to focus quality research articles in high-ranking international academic journals, thus replacing the student enrolment model which had previously underpinned central government funding to HEIs. With PBRF's introduction, there was a major shift in academic performance evaluation, although anecdotally at least there was no new resource commitment by universities to provide adequate resources to support academic staff productivity. Staff are required to manage their academic productivity within the available limited resources. Likewise, the Excellence in Research for Australia (ERA) initiative was introduced to the country in 2010, which identifies and promotes research across the full spectrum of research activity in Australia. Researchers at Australian HEIs are evaluated against the national and international standards and this, thus, might be one of the reasons why the relationship is not significant.

During the delivery phase, it may signify the extent to which academics perceive their institution to be committed to the teaching environment and making sure that staff have the tools needed to discharge their part of the contract between the HEI and the student (Krause & Coates, 2008). This might translate into the allocation of resources to ensure the preparedness of students so as to empower students, and so that academics are not dealing with 'trivial questions' from students. The use of resources could go beyond academic to also include other students who undertake a degree of formal mentoring, not just pastoral but also feedback and guidance on academic work.

For academics, resources also mean such factors as a commitment to the teaching environment and the support for teaching activities; for example, this might be blended teaching (Garrison & Kanuka, 2004). In addition, our research provides academic managers

and administrators with the tools for measuring, managing, and improving productivity in their institutions and departments. In summary, practitioners in HEIs must have a nuanced approach to the resources at their disposal if they are expecting productivity to increase. Whichever approach is adopted, practices must be congruent with the objectives of the HEI and how it wishes to be positioned in the marketplace, also taking into account whether the primary objective is a return on investment or a growth agenda.

Limitations and Future Research Directions

Using a bottom-up approach we make a worthy first contribution examining service productivity from the perspective of HEI academics. However, given that the study presented here is the first such attempt, we recognize that our work provides a platform for others. Our study makes an important contextual contribution at a time when academia is going through an important transformational period, with little doubt that the student-HEI contract is changing (Tight, 2013). Despite providing a timely insight, there are, nevertheless, limitations that we acknowledge, owing to the confines of our research domain.

A limitation of our study is that the domain is constrained to the specific subject area of Business. Given that most HEIs offer subjects that demand a greater need for resources, such as machinery for Engineering courses and studios for Art, it may be worth undertaking a wider study to include these disciplines. These types of courses, which go beyond 'chalk and talk' type delivery, mean that the resources infrastructure will be more intensive, and thus consequentially the activity needed to support front-line academics and students. The strength of the type of the antecedents may vary, but there is unlikely to be any incongruence between the antecedents in our model and those applicable in these other circumstances.

Beyond our research domain, a limitation is that we undertook our study in an area that is highly intangible, and some argue, unique. Thus, in order to test our model's external

validity, we would recommend that future researchers apply our model in other services sectors.

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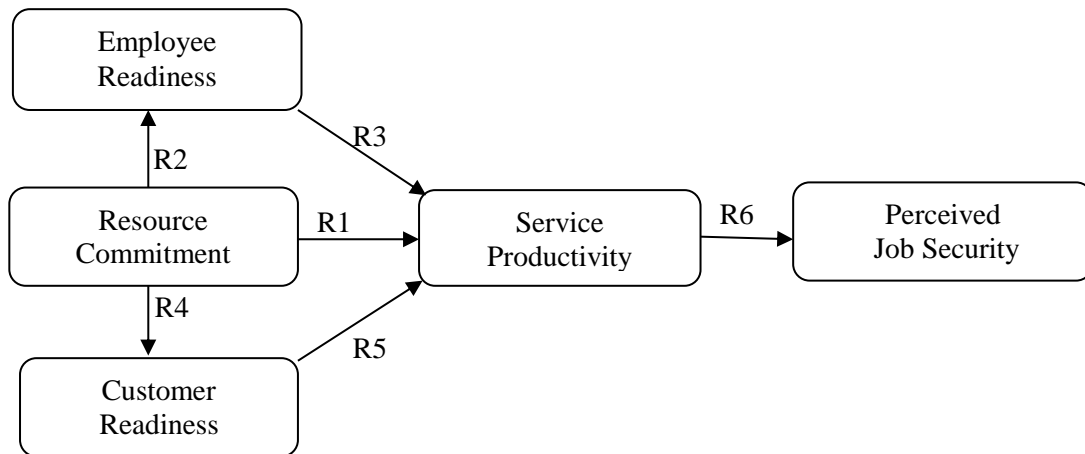
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Figure 1: Research Model



Data Tables

Table 1: Factor Loading for Scale Items

Construct	Item	Factor Loading
	Activity levels in my institution have increased	.96
<i>Service productivity</i>	Balancing the efficiency and effectiveness of my institution's outputs is a major priority for my institution	.97
	My institution delivers its services promptly	.85
	My institution meets its performance targets and expectation	.93
<i>Resource commitment</i>	My institution is committed to providing the necessary technological resources required to improve productivity	.95
	My institution is committed to providing the necessary management support	.95
	Financial resources made available to my institutions are inadequate	.89
	Employees in my institution are knowledgeable about our products and services	.95
	Employees in my institution are well-trained and competent to perform their work accurately	.95
<i>Employee readiness</i>	Employees in my institution know their job and responsibilities for which they are hired	.89
	In the course of performing tasks in my institution, employees understand how to complete the necessary form/paperwork	.95
	Employees in my institution understand how different work groups contribute to the organization's goals	.95
	My institution's employees are professional when performing their duties	.89
<i>Customer readiness</i>	Students in my institution are highly motivated to perform their role during seminars	.96
	Students in my institution work cooperatively with their tutors	.91
	Students in my institution prepare before attending seminars	.96
<i>Perceived job security</i>	Employees in my institution would leave to take a similar job at another institution if given the choice	.94
	There seems to be a feeling that dissatisfaction is high among our customers	.97
	My institution's reputation has improved	.99

Table 2: Goodness-of-Fit Indices

Index	Structural Model Results			
	India	Aus/NZ	UK	OD
χ^2 & df	323 and 146	333 and 146	358 and 146	367 and 146
χ^2/df	2.21	2.28	2.45	2.51
CFI	.96	.96	.96	.97
TLI	.95	.95	.96	.97
RMSEA	.08	.08	.07	.07

Table 3: Co-linearity Index

Construct	India		Aus/NZ		UK		Overall Data	
	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF	Tolerance	VIF
Service productivity	.35	2.83	.42	2.38	.46	2.17	.35	2.87
Resource commitment	.21	4.80	.21	4.72	.21	4.68	.20	5.14
Employee readiness	.32	3.13	.38	2.66	.44	2.26	.38	2.65
Customer readiness	.28	3.52	.29	3.46	.31	3.28	.28	3.55
Perceived job security	.29	3.39	.33	3.02	.30	3.26	.24	4.20

Table 4: Average Variance Extracted, Composite Reliability and Squared Multiple Correlations

	AVE				CR				R ²			
	India	Aus/NZ	UK	OD	India	Aus/NZ	UK	OD	India	Aus/NZ	UK	OD
Service productivity	.82	.78	.82	.83	.93	.93	.95	.95	.65	.60	.56	.68
Resource commitment	.84	.81	.84	.85	.94	.93	.93	.94	N/A	N/A	N/A	N/A
Employee readiness	.78	.79	.78	.80	.97	.70	.96	.96	.63	.62	.53	.60
Customer readiness	.88	.88	.88	.89	.96	.96	.96	.96	.65	.68	.64	.65
Perceived job security	.92	.92	.90	.92	.97	.97	.97	.97	.55	.52	.51	.57

N/A = Resource commitment is an exogenous construct

Table 5: Structural Path Coefficients

Relationship	Overall Data	Total Effects		
		India	Aus/NZ	UK
Resource commitment → service productivity	.43***	.29*	.11^	.33***
Resource commitment → employee readiness	.79***	.79***	.79***	.73***
Employee readiness → service productivity	.21***	.21*	.28**	.20**
Resource commitment → customer readiness	.83***	.81***	.82***	.80***
Customer readiness → service productivity	.29***	.38***	.45***	.30***
Service productivity → perceived job security	.80***	.74***	.70***	.66***

All coefficients are standardized.

*** significant at.001 (two-tailed); ** significant at.01 (two-tailed); significant at.05 (two-tailed)

^ Not significant at.05 (two-tailed)

Overall data: $\chi^2 = 367$ df = 143; $p < .01$; CMIN/df=2.57; CFI=.97; TLI=.97; RMSEA=.07.

India: $\chi^2 = 367$ df = 143; $p < .01$; CMIN/df=2.57; CFI=.97; TLI=.97; RMSEA=.07.

Aus/NZ: $\chi^2 = 367$ df = 143; $p < .01$; CMIN/df=2.57; CFI=.97; TLI=.97; RMSEA=.07.

UK: $\chi^2 = 367$ df = 143; $p < .01$; CMIN/df=2.57; CFI=.97; TLI=.97; RMSEA=.07.