Proceedings of the International Conference on Industrial Engineering and Operations Management
Paris, France, July 26-27, 2018

SEM Analysis of the Impacts of Second Order Construct of Job Demands on Employees' Job Performance in Telecommunication Sector

Abdul Talib Bon[1] and Abdirahman Mohamud Shire[2]
Faculty of Technology Management, Business and Entrepreneurship
University Tun Hussein Onn Malaysia
Parit Raja, 86400, Malaysia
talibon@gmail.com[1] and shire_288@hotmail.com[2]

Abstract

This study aims to examine the role of job demands on employees' job performance. Using a sample of 183 employees, the study investigated the impact of four variables of job demands including quantitative, problem solving, attention and responsibility demands on two variables of employees' job performances such as task and contextual performances. Structural equation modeling analyses showed that the variables of job demands have negative and significant impact on employees' job performances. The construct of job demands was designed as designed as second-order construct. The analysis from the second order model is utilized to examine the relationship between the independents variables of job demands and job performance. To validate the second-order formative construct model of job demands, alternative models were established for comparison with relative fit.

Keywords
Job Demands, Job Performance, Employees and Impact.

1. Job Demands-Resources (JD-R) Model

The job demands-resources (JD-R) model is an occupational stress model that suggests strain is a response to imbalance between demands on the individual and the resources he or she has to deal with those demands (Moodie et al., 2014). The JD-R model became highly popular among researchers (Moodie et al., 2014). The current version of the model proposes that high job demands lead to strain and health impairment (the health impairment process), and that high resources lead to increased motivation and higher productivity (the motivational process). The JD-R model developed by Demerouti and his associates (Demerouti et al., 2001), the JD-R model can be used as a tool to manage human resources in organizations because it can be applied to a wide range of occupations to improve employee wellbeing and job performance (Bakker et al., 2013).

JD-R model argues that the factors or characteristics salient in a work environment determine the performance of employees at work (Moodie et al., 2014). According to this model, there are two general categories of work environment i.e. job demands and job resources study (Moodie et al., 2014; Bakker et al., 2013). Job demands are the physical, psychological, social and organizational factors which require constant physical and psychological efforts or skills and are therefore linked to physical and psychological costs whereas job resources are the physical, psychological, psychological, social and organizational aspects of a job which enable the achievement of goals and objectives while at the work place, reduce the negative effects associated with job demands to encourage personal growth, learning and development" (Luo et al., 2015).

The model also proposes two psychological processes that take place as a result of the existence of perceived job demands and resources (Michelle, 2013). These processes relate to health deficiency and motivation. The health impairment process occurs when jobs are designed badly or those whose demands chronically deplete a worker's

mental and physical resources which reduce energy and degrade health situation (Michelle, 2013). The motivational process is where job resources brings forth their motivating potential and cause the workers to show high levels of work engagement, low levels of cynicism and above performance (Luo et al., 2015; Michelle, 2013). Therefore, the present paper focused the impact of job demands on employees' job performance only.

1.1 Job Demands

Job demands refers to the degree to which the working environment contains stimuli that require some effort (Luo et al., 2015), which suggests that job demands may lead to negative consequences if they require additional effort to achieve work goals (Luo et al., 2015). It also refers to aspects of the job that require sustained effort, and, as such incur certain costs as a result (Moodie et al., 2014). Job demands can be physical, psychological, social, or organizational. Job demands are usually divided into two: challenge job stressors and hindrance job stressors (Moodie et al., 2014). The term "hindrance job stressors" refers to "unpleasant, undesirable and excessive" factors in the course of work which get in the way of the ability of an individual to achieve goals associated with the specific job that he or she does such as role conflict, role overload and role ambiguity and are viewed as negative aspects of job demands (Luo et al., 2015). On the other hand, the term "challenge job stressors" refers to stressors which have the potential to promote the employee's personal growth and career growth as well and may include factors like high levels of workload, time pressure and numerous responsibilities and are viewed as positive stressors due to their characteristic potential to reward the employee (Luo et al., 2015). In the present study, job demands reflect the amount of work required from the employees, such as the extent to which they has to work under time pressure, and the degree to which the employees are expected to complete conflicting job demands. Hence, job demands are categorized into four variables including quantitative demands, attention demands, problem-solving demands, and responsibility demands. These job demands are selected as they reflect the job of the employees in Telecommunication in Somaliland.

Quantitative demand refers to work that requires hard work and fast, excessive work, time pressure and conflicting demands (Michelle, 2013). A concept associated with quantitative demand is workload (Moodie et al., 2014). Workload may refer to work time commitments such as the number of hours devoted to paid work and work-related activities (Moodie et al., 2014), but it has also been referred to as time pressure, in which individuals perceive they have too many things to do and not enough time to do them (Luo et al., 2015). There are two main dimensions of quantitative demands at work named as intensity and extensity (Luo et al., 2015).

Attention demands concern the degree to which constant monitoring of work is required (Dieter & Elsy, 2016). Previous researches have helped to refine the job demands construct by proposing and clarifying possible sub-constructs. For instance, Dieter & Elsy, (2016) distinguished between monitoring demands, problem-solving demands, and production responsibilities. Dieter & Elsy, (2016) also included mental demands of work, such as attention demands and problem-solving demands. "The identification of these two demands is important because it helps clarify how work design can actually impact the information-processing requirements of work" (Michelle, 2013).

Problem solving job demand refers to the affective component of work and the degree to which one has to be face actively stressful situations because of one's work (Dieter & Elsy, 2016). It is also defined as the frequency one is exposed to skillfully demanding situations (Luo et al., 2015) and to those aspects of the job that require sustained excellent solutions and great efforts because of (extensive) contacts with others (Luo et al., 2015). In the context of communication technology sectors, employees have to deal with problem solving demands as they are confronted with various demands, which sometimes are unrealistic, from daily tasks (Moodie et al., 2014).

Responsibility demands refer to the extent to which the individual can make errors which can result in a costly loss of output (Katrien et al., 2016). In modern society, responsibility demand has become a very common phenomenon (Katrien et al., 2016). Responsibility demands refers to a work arrangement whereby employees go to work in turns to ensure that the services being provided are available around the clock with full Responsibility (Marieke & Jeroen, 2014). The responsibility demands of the communication technology jobs are so intense that employees leave the profession. This leads to the shortages in the Middle East and the rest of Asia (Marieke & Jeroen, 2014).

2. Job Performance

Improving the performance of employees has been a topic of great interest to practitioners as well as researchers (Livia *et al*., 2015). But what is job performance and how it is measured so that it reflects the individual's contribution, effort and motivation into the job has been a topic of great debate amongst scholars. Indeed, there is no consensus concerning the definition of the term "job performance" among experts.

Job performance is defined it as the execution of a task through the doing of action. It is in line with Spagnoli & Caetano, (2012), and Shaikh et al., (2012) define it as work-related behaviours and the resultant outcomes. Madsen et al., (2005) define job performance as something that is individual in nature. It has also been addressed that job performance refers to the behaviour of employees regardless of the results of that behaviour which is key in differentiating performance from outcomes (Shaikh et al., 2012). As behaviour, performance includes both observable actions and unobservable actions such as thought processes and decision making; all of which are under the control of individual employees. This explains that positive performance by an employee does not always lead to a success, because it may be affected by other factors such as the economy and the support of fellow employees (Livia et al., 2015).

Task performance refers to critical activities in the execution of activities that are specified by the job description. It is also known as "a goal oriented assessment practice" (Kristina &Thomas 2014). It is also referred to as in-role performance, which focuses on activities that contribute to the organization's technical core (Guidice & Mero, 2012), and behaviours that directly serve the goals of the organization (Suliman & Al Kathairi, 2013). This contribution can be both direct (e.g., in the case of production workers), or indirect (e.g., in the case of managers or staff personnel) (Kristina &Thomas 2014). Murphy (2011) describes task performance as focusing on role-prescribed activities, which means task performance is formally specified and mandated by the job description (Murphy, 2011).

Contextual performance is an aspect of job performance which refers to activities which facilitate the social and psychological growth of the organization (Kazlauskaite et al., 2012). It has also been defined as the behaviour which creates an environment necessary for the execution of activities which lead to the accomplishment of organizational goals and objectives (Kristina & Thomas 2014). Occasionally, contextual performance is referred to as extra-role performance, defined as employee behaviours that are discretionary believed to directly promote the effectiveness of the organization, without necessarily directly influencing the employee's productivity (Livia et al., 2015). In other words, extra-role performance involves actions that go beyond the stated formal job descriptions and that increase organizational effectiveness (Suliman & Al Kathairi, 2013). According to Livia et al., (2015), employees engage in extra-role performance because they have believe there are available resources within the organization they desire (Livia et al., 2015).

Some of the examples of extra-role behaviours according to Klein et al., (2012) include helping co-workers in their assigned tasks, protecting the organization from potential problems, making constructive suggestions to improve the functioning of the organization, and gaining knowledge, skills, and abilities that will benefit to the organization. In other words, contextual performance includes non-job-specific behaviours (Kristina & Thomas 2014). Particularly, Kazlauskaite et al., (2012) outlined two types of contextual performance; (1) behaviour that facilitates the smooth running of activities within an organization, and (2) behaviour that seeks to change or improve the work procedures within an organization. According to Livia et al., (2015), employees are said to display contextual behaviour when they persistently show enthusiasm and extra effort in the course of successful completion of their activities, volunteer to engage in activities that are not part of their job description, help and cooperate with others, follow organizational rules and procedures, interpersonal facilitation, and dedication to their jobs (Kristina & Thomas, 2014). As the present study attempts to investigate the factors that affect employees' job performance, both task and contextual, the next discussion centers on such factors. To help understand employees' job performance, a job demands-resources model is invoked as it is argued that job performance is mainly influenced by the nature of the job employees do.

3. Relationship between Job Demands and Job Performance

The JD-R model distinguishes between two main types of task characteristics: job demands and job resources. This paper focused job demands only. Originally, the model aimed at explaining specific adverse work outcomes, such as emotional exhaustion, cynicism, absenteeism, and performance by job demands and job resources (Bakker et al., 2013). Now, it offers a cognitive-emotional framework for understanding human performance under stress (Schaufeli & Barker, 2004). Bakker et al., (2012), and Rich, et al., (2010) have expanded the JD-R model to assess the extent to which burnout and engagement predict outcomes such as performance and citizenship behaviours. In general, the model proposes that exhaustion, cynicism, and lack of efficacy on the part of employees are detrimental to performance and lead to higher absenteeism (Bakker et al., 2013). On a contrary, engaged employees will focus on their physical, cognitive, and emotional efforts toward goal attainment, thus leading to higher performance and citizenship behaviours (Rich et al., 2010). According to Lazarova et al. (2010), applying the JD-R model not only allows researchers and practitioners to make sense of the multitude of individual and contextual predictors but also provides a theoretical grounding for the relationship between these predictors and performance. In the aspect of logical flow in the JD-R model, resources lead to positive emotions such as happiness and enthusiasm, commitment, better physical and psychological health, and the ability to create and mobilize more resources. Consequently, employees become engaged in their roles and in return contribute to effective role performance (Bakker et al., 2013). Based on the above discussion, the following hypothesis is therefore proposed:
Hypothesis 1: Job demands have negative impact on employees' job performance.

4. Research Design

Research design spells out how the research is carried out toward the accomplishment of research objectives and answering of questions. In other word, research design constitutes the outline for the collection, measurement and analysis data (Cooper and Schindler, 2013). Zikmund et al. (2012) defined research design as a master plan that outlines the methods and procedures for collecting and analyzing data. Moreover, research design helps the researcher in the allocation of inadequate resources by posing vital choices in methodology (Cooper and Schindler, 2013). The main research design employed in the present research was survey. Survey is defined as a measurement process that utilises a measurement tool called a questionnaire, measurement instrument, or interview schedule (Cooper and Schindler, 2013). Surveys attempt to describe what is happening or to study the reasons for an exacting business activity (Zikmund et al., 2012). The questionnaire is the most common information collection tool in business research (Cooper and Schindler, 2013). The questionnaire is the most extensively used information collection technique in a survey study (De Vaus, 2013). Questionnaire is an organized set of questions or measures used by respondents or interviewers to record answers data (Hair et al., 2010).

According to Cooper and Schindler (2013), sampling is the process whereby some elements from the population are selected to represent the whole population. Sample size is the number of units that is required to get accurate findings (Fink, 2003). For the purpose of this paper, the sample size was 183.

According to Sekaran (2003), there are many methods that can be possibly used to collect data from respondents such as interviews and questionnaires. Interviews involve unstructured and structured approach. Interviews can differ from being highly unstructured to highly structured. Unstructured interviews are usually conducted by an extremely flexible approach. A questionnaire, on the other hand, is a pre-written set of questions that respondents are required to answer, which is generally within close defined alternatives (Sekaran, 2003). A questionnaire is an efficient data collection mechanism but only when the researcher is aware of what is required and the measures of the variables involved (Sekaran, 2003). In the present paper, questionnaires were used because the researcher was interested in getting specific responses on the issues at hand i.e., job demands and job performance via specific measurements.

5. Research Findings and Data Analysis

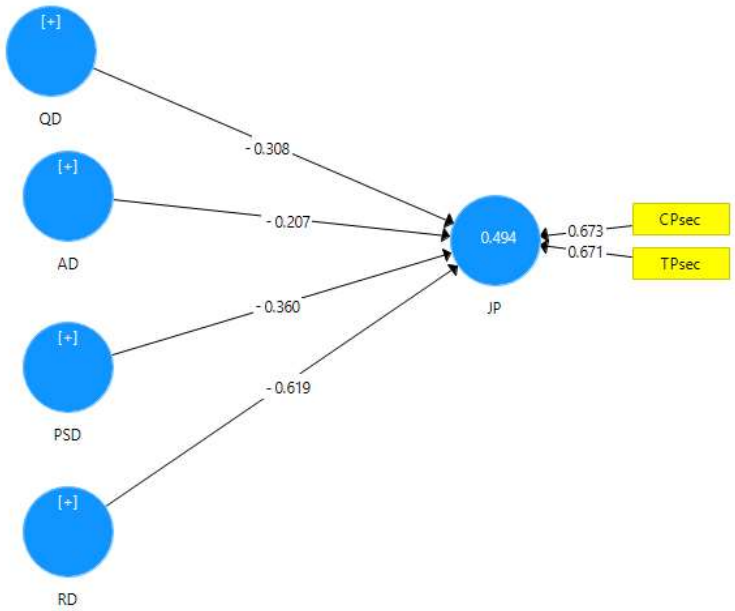
This section highlights the research findings and data analysis. The research findings and data analysis are documented in several stages including the first stage as data preparation such as response rate and data inspection,

description about participants, and exploratory factor analysis. The second stage of the data analysis is about the assessment of constructs validity including tests for reliability, normality, homoscedasticity, linearity and multicollinearity. The third stage is about structural equation modeling (Partial Least Squares) analysis such as firstly; the model validation including convergent validity, discriminant validity, reflective measures validity and formative measures validity and secondly; the hypotheses testing were performed through structural model assessment. Finally, the data analysis was conducted using SmartPLS and Statistical Package of the Social Sciences (SPSS).

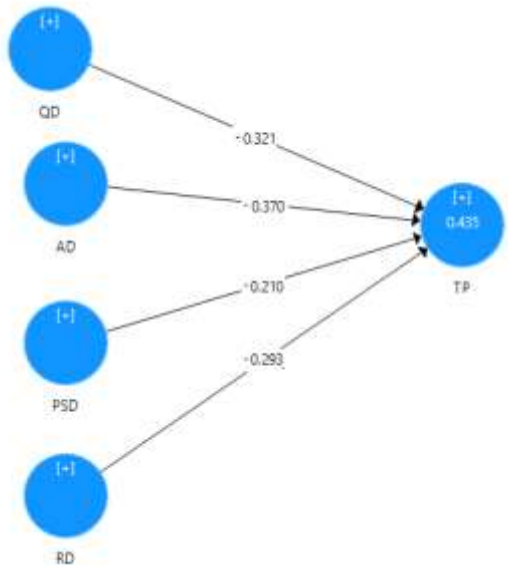
5.1 The Effects of Job Demands on Employees' Job Performance

To validate the second-order formative construct model of job demands, alternative models are established for comparison with relative fit. The alternative model proposes the four dimensions; quantitative, problem solving, attention and responsibility demands as independent constructs linked directly to the dependent constructs job performance (JP), task performance (TP) and contextual performance (CP) as shown in Figure 1.

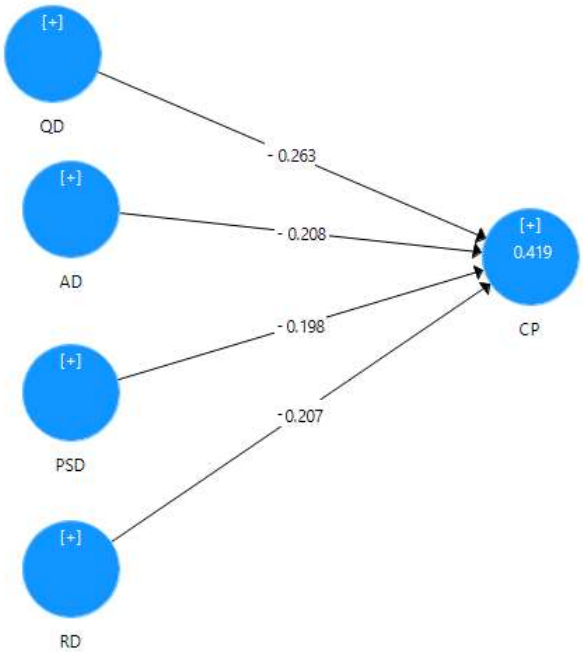
Figure 1a show the direct linkage of the four dimensions; quantitative, problem solving, attention and responsibility demands directly with the second order of job performance; the results revealed that job performance reported R2 of .494 with positive, moderate and weak, and significant relationships from all variables of job demands. Figure 1b depicts the relationship between the four dimensions; quantitative, problem solving, attention and responsibility demands directly with task performance. The results show that task performance reported *R*2 of .435 with positive, weak and significant relationships with all constructs without any exception. Figure 1c illustrates the direct linkage of the four dimensions of job demands with contextual performance. The results revealed that contextual performance reported R2 of .419 with positive, weak and significant relationships from all constructs. Table 1 summarizes the effects of first order dimensions of job demands on employees' job performance.



(a)



(b)



(c)

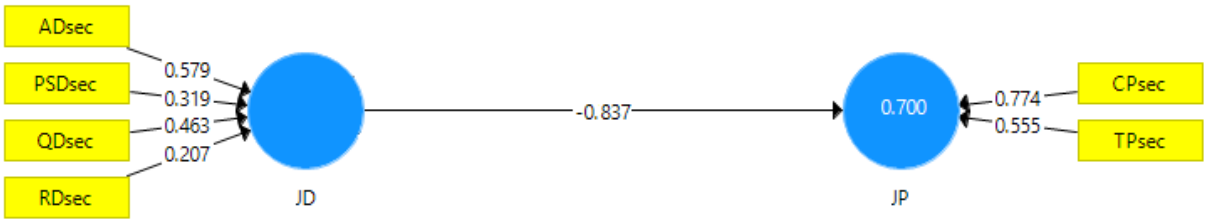
Figure 1: The first order analysis of Job demands dimensions: (a) Job demand dimensions and job performance (JP), (b) Job demand dimensions and task performance (TP), (c) Job demand dimensions and contextual performance (CP).

Table 1: Effects of first order dimensions of job demands on job performance

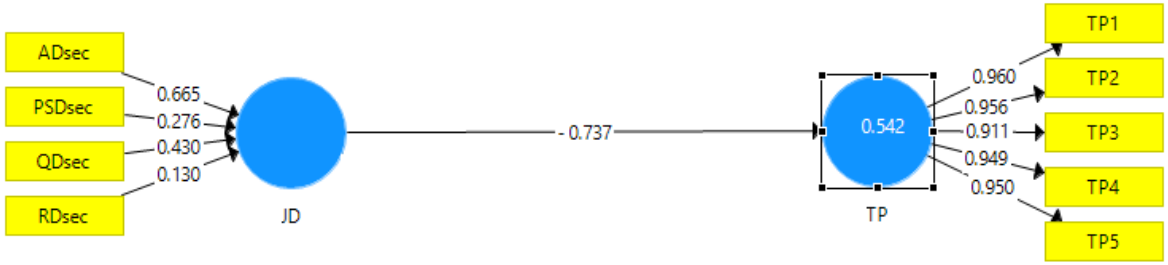
Dependent Construct	**Independent constructs**	**Path Coefficient**	**T Statistics**	**R2**
Job Performance				.494
	Quantitative Demands	-.308	4.578	
	Problem Solving Demands	-.207	3.650	
	Attention	-.360	5.852	

	Demands			
	Responsibility Demands	-.619	14.653	
Task Performance				.435
	Quantitative Demands	-.321	3.613	
	Problem Solving Demands	-.370	3.821	
	Attention Demands	-.210	2.673	
	Responsibility Demands	-.293	3.120	
Contextual Performance				.419
	Quantitative Demands	-.263	2.852	
	Problem Solving Demands	-.208	2.649	
	Attention Demands	-.198	2.334	
	Responsibility Demands	-.207	2.653	

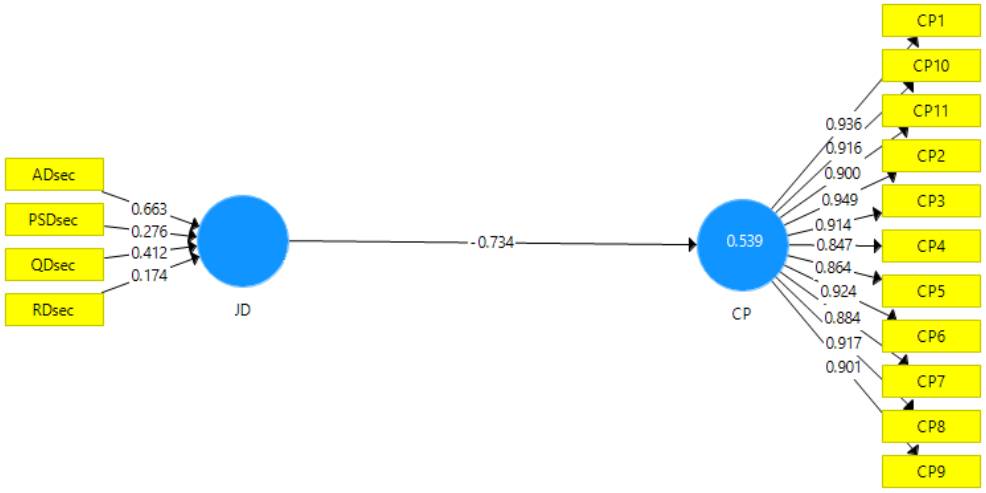
Figure 2 illustrates the effects of second order formative construct of job demands on employees' job performance (JP: second order construct), task performance (TP) and contextual performance (CP). Job demands construct and job performance construct are created by linking the four dimensions of quantitative, problem solving, attention and responsibility demands with their latent constructs scores and the two dimensions of task performance and contextual performance with their latent constructs scores respectively. Then, the job demand construct is connected directly to each dependent construct, as illustrated in Figure 2.



(a)



(b)



(c)

Figure 2: The second order analysis of Job demands dimensions: (a) Job demands (JD) and job performance (JP), (b) Job demands (JD) and task performance (TP), (c) Job demands (JD) and contextual performance (CP).

Figure 2a presents the direct connection between job demands second order construct and the second order construct of job performance, and the result showed high negative and significant path coefficient between the two constructs -.837. The analysis reported R2 value of .700. In addition, it shows that all outer weights between the four indicators and their formative construct are significant. Similarly, the outer weights between the two indicators and their formative construct of job performance are significant. Figure 2b depicts the relationship between job demands second order construct and task performance (TP). The result showed high positive and significant path coefficient between the two constructs -.737 with R2 value of .542. Also, the results have shown that all outer weights between the four indicators and their formative construct of job demands are significant. Figure 3c shows the association between job demands second order construct with contextual performance, the results showed high positive and significant path coefficient between the two constructs -.734 with an R2 value of .539. All outer weights between the four indicators and their formative construct of JD are significant. Table 2 summarizes the effects of second order construct of job demands on employees' job performance.

6. Conclusion

The aim of this paper was to investigate the impact of job demands on employees' job performance. The analysis was conducted using Smart PLS and based on the findings of the study, the job demands have a significant and negative relationship with employees' job performance. In addition, the proposed hypothesis was supported, which means there was a negative and significant impact of job demands on employees' job performance.

Table 2: The effects of second order construct of job demands on job performance

Dependent Construct	Independent constructs	Outer Weight	T Statistics	Path Coefficient*	R2
Job Performance		Job Demands		-.837	.700
	Quantitative Demands	.579	6.127		
	Problem Solving Demands	.319	3.982		
	Attention Demands	.463	5.462		
	Responsibility Demands	.207	2.671		
Task Performance		Job Demands		-.737	.542
	Quantitative Demands	.665	6.438		
	Problem Solving Demands	.276	3.119		
	Attention Demands	.430	4.982		
	Responsibility Demands	.130	2.041		
Contextual Performance		Job Demands		-.734	.539
	Quantitative Demands	.663	6.419		
	Problem Solving Demands	.276	3.259		
	Attention Demands	.412	4.385		
	Responsibility Demands	.174	2.128		

*Path Coefficient: Significant at the 0.01 level

References

Bakker, A. B., Demerouti, E., de Boer, E., & Schaufeli, W. (2013). Job demands and job resources as predictors of absence duration and frequency. Journal of Vocational Behavior, 62, 341–356.

Bakker, A. B., Oerlemans, W., & Ten Brummelhuis, L. L. (2012). Becoming fully engaged in the workplace: What individuals and organizations can do to foster work engagement. In R. Burke & C. Cooper (Eds.), the fulfilling workplace: The organization's role in achieving individual and organizational health. Farnham: Gower.

Dieter V. & Elsy V., (2016),"Over education and job satisfaction: the role of job demands and control", International Journal of Manpower, Vol. 37 Iss 3 pp. 456-473.

Katrien V.; Paul G. & Deva R., (2016),"Engaged customers as job resources or demands for frontline employees?", Journal of Service Theory and Practice, Vol. 26 Iss 3 pp. 363 -383.

Kazlauskaite, R., Buciuniene, I. & Turauskas, L. (2012), "Organisational and psychological empowerment in the HRM-performance linkage", Employee Relations, Vol. 34 No. 2, pp. 463 -483.

Klein, H.J., Molloy, J.C. & Brinsfield, C.T. (2012), "Reconceptualising workplace commitment to redress a stretched construct: reversing assumptions and removing confounds", Academy of Management Review, Vol. 37 No. 1, pp. 130-151.

Kristina S.; & Thomas S. J., (2014),"Multiple affective commitments: quitting intentions and job performance", Employee Relations, Vol. 36 Iss 5 pp. 516 – 534.

Livia L.; Barakat Melanie P.; Lorenz Jase R.; Ramsey Sherban L.; & Cretoiu. (2015),"Global managers: An analysis of the impact of cultural intelligence on job satisfaction and performance ", International Journal of Emerging Markets, Vol. 10 Iss 4 pp. 781 – 800.

Luo Lu Hui Yen Lin Chang-Qin Lu Oi-Ling Siu, (2015),"The moderating role of intrinsic work value orientation on the dual-process of job demands and resources among Chinese employees", International Journal of Workplace Health Management, Vol. 8 Iss 2 pp. 78 – 91.

Marieke T.; & Jeroen J., (2014),"Job demands-resources and employee health and wellbeing", Career Development International, Vol. 19 Iss 1 pp. 101 – 122.

Michelle T., (2013),"The development of a work-life fit model: a demands and resources approach", International Journal of Managing Projects in Business, Vol. 6 Iss 4 pp. 792 – 801.

Moodie S., Dolan S.L., Burke R., (2014). Exploring the causes, symptoms and health consequences of joint and inverse states of work engagement and burnout, Management Research: the Journal of the Iberoamerican Academy of Management, (in press).

Murphy, L. A. (2011). A Macroergonomics approach examining the relationship between work-family conflict and employee safety. Portland State University.

Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. The Academy of Management Journal (AMJ), 53(3), 617-635.

Schaufeli, W. B., & Bakker, A. B. (2004). Job demands, job resources, and their relationship with burnout and engagement: A multi-sample study. Journal of Organizational Behavior, 25, 293–315.

Shaikh, M., Bhutto, N. and Maitlo, Q. (2012), "Facets of job satisfaction and its association with performance", International Journal of Business and Social Science, Vol. 3 No. 7, pp. 322-326.

Spagnoli, P. & Caetano, A. (2012), "Personality and organizational commitment- the mediating role of job satisfaction during socialization", Career Development International, Vol. 17 No. 3, pp. 255-275.

Suliman, A. and Al Kathairi, M. (2013), "Organizational justice, commitment and performance in developing countries: the case of the UAE", Employee Relations, Vol. 35 No. 1, pp. 98-115.

Biographies

Abdul Talib Bon is Professor of Technology Management in Department of Production and Operations Management, Faculty of Technology Management and Business at the Universiti Tun Hussein Onn Malaysia. He has a PhD in Computer Science, which he obtained from the Universite de La Rochelle, France in the year 2008. His doctoral thesis was on topic Process Quality Improvement on Beltline Moulding Manufacturing. He studied Business Administration major in Quality Management at the master's level in the Universiti Kebangsaan Malaysia for which he was awarded the MBA in the year 1998. He's bachelor degree and diploma in Mechanical Engineering which his obtained from the Universiti Teknologi Malaysia. He received his postgraduate certificate in Mechatronics and Robotics from Carlisle, United Kingdom in 1997. He is Director of Teaching Factory and Manager of Centre for Technology (Furniture Innovation Technology) from 1 September 2016 and Head of Program Bachelor of Technology Management (Furniture Design and Manufacturing) with Honours from 2014 until 2017. Before this he was the Deputy Dean (Research and Development) at the Faculty of Technology Management and Business in the Universiti Tun Hussein Onn Malaysia from 2008 until December 2011. Dr. Abdul Talib Bon has had over 30 year experience of teaching in higher learning education. A major part of his teaching experience involves teaching mechanical engineering students in polytechnics. However, from the year 1999, he was given the opportunity to be jointed in the Institut Teknologi Tun Hussein Onn (ITTHO), Universiti Teknologi Malaysia as a lecturer in Mechanical Engineering Department. In this institute, he teaches engineering management and quality control at the under-graduate level. Dr. Abdul Talib Bon has multidisciplinary research interests that encompass industrial engineering, quality management and production and operation management. His completed 17 research grant projects as project leader include applications of forecasting in industries. His current research project is looking into developing process quality improvement (PQI) in manufacturing industries. He has supervised more than 90 undergraduate and postgraduate research projects. He has served as a reviewer for a number of engineering management and computer science conferences and journals as part of his expertise sharing initiatives. He had published more than 180 International Proceedings and International Journals and 8 books. He is also Fellow and President of Industrial Engineering and Operation Management Society (IEOMS, Malaysia), Professional Technologist of Malaysia Board of Technologists (MBOT), Council member of Management Science and Operation Research Society of Malaysia (MSORSM), member of International Association of Engineers (IAENG), member of Institute of Industrial Engineer (IIE), USA, member of International Institute of Forecasters (IIF), member of

Technological Association of Malaysia (TAM) and associate member of Malaysian Institute of Management (AMIM)..