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HRM and green innovation of manufacturing firms in Australia

Gestión de recursos humanos e innovación ecológica de empresas manufactureras en Australia

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ABSTRACT

Following the footsteps of resource-based view theory, the present study attempted to examine HRM and its impact on green innovation followed by the interplay of green transformational leadership. The study collected triadic data by using a survey questionnaire from 185 small and medium manufacturing firms in New South Wales, Australia. Results from the data analysis suggest that HRM prospects of green ability and motivation have a significant relationship with green innovation. Accordingly, the results also indicated a significant relationship between green transformational leadership and green innovation. Overall, the present research has advanced understanding of green GRM and green leadership to utilize personnel prospects to further green innovation effectively.

Keywords: Green Hrm, Green ability, green motivation, green transformational leadership, green innovation.

RESUMEN

Siguiendo los pasos de la teoría de la visión basada en recursos, el presente estudio intentó examinar la gestión de recursos humanos y su impacto en la innovación ecológica seguida de la interacción del liderazgo transformacional. Se recopiló datos triádicos mediante el uso de un cuestionario a 185 pequeñas y medianas empresas manufactureras en Nueva Gales del Sur, Australia. Los resultados del análisis de datos sugieren que las perspectivas de la gestión de recursos humanos de capacidad y motivación ecológicas tienen una relación significativa con la innovación ecológica. En consecuencia, los resultados también indicaron una relación significativa entre el liderazgo transformacional verde y la innovación. En general, la presente investigación ha avanzado la comprensión del GRM verde y el liderazgo para utilizar las perspectivas del personal y promover la innovación verde de manera efectiva.

Palabras clave: Green Hrm, green ability, green motivation, green transformational leadership, green innovation.

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INTRODUCTION

Innovation is the talk of the town across scholarly and corporate discussions. Organizations have understood and realized that businesses could no longer survive and sustain in the competitive world without focusing on the idea of innovation to bring effectiveness and efficiency to the business activities. Importantly, the global climatic conditions and scarcity of natural resources have made organizations not just become merely innovative but to become environmentally responsible. In other words, organizations are required to focus on green innovation. However, what could potentially be done to infuse green innovation and innovative green behaviors across the organization is a tricky question to respond to (Janszen: 2000). Scholars have outlined that employees can make a significant impact in facilitating organizations to be innovative (Kang & Lee: 2017, pp. 219-232), whereby leadership also has a significant role to play in this regard. In particular, transformational leaders have been termed more significant and effective in attaining organizational ends as they engage in inspiring individuals rather than forcing (Choi: 2016). Hence, one can assert that green transformational leadership will be more effective in furthering behaviors that would cause green innovation.

Accordingly, to boost employee behaviors and outcomes, HRM factors are also reported to play a considerable role (Alfes et al.: 2013, pp. 330-351), and scholars have indicated that some organizations fail to become innovative because of the lack of ability and motivation among the employees in doing so (Singh et al.: 2020) and hence, the same could be perceived when it comes to green prospects respectively. Henceforth, the present study attempted to examine some crucial relationships how green HRM factors can influence green innovation and how leadership can interplay with relationships to buffer green innovation.

METHODOLOGY

Green HRM emerged as a result of the rise in the green movement, 'which caters to four basic principles that include sustainability, environmentalism, non-violence, and social justice (Mozammel: 2019, pp. 2632-7686). Green prospects are generally gaining much appreciation (Umrani et al.: 2020, pp. 50-60). Green HRM primarily caters to a major internal set of activities whereby the personnel authorities work alongside top management to bring people-related processes and practices that are environment-friendly. Hence, it could be said that green HRM showcases environmental protection and concerns of the business. Scholarly studies have reported the significance of HRM in general (Ahmed & Ogalo: 2019, pp. 1-15) and also stated the promising role of green HRM on innovation in production (Singh et al.: 2020). Here, a lot of debates have been underlined from the literature that suggests that amongst all HR factors, the prime element in this prospect is that organizations to take efforts in hiring the right people with right environmental values, through following green procedures and once those employees join, are given green training to enhance green skills and given opportunity to apply their green skills (green ability). Following this, once the employees deploy green skills and knowledge at work, the second important HRM practice is to ensure it records their environmental practices, appraises their performance accordingly, and rewards them for acquiring certain green behaviors (green motivation) (Singh et al.: 2020). Hence the present study tested the following:

H1: Green ability will be positively related to green innovation.

H2: Green motivation will be positively related to green innovation

Transformational leaders have been found significant in inspiring people that ignites the passion for doing more than the mere job description. Transformational leaders help shape desired behaviors through exemplary guidance and support. Leaders with transformation styles have been termed significant for both in-role and extra-role behaviors and outcomes. This is because transformational leaders work to stimulate energy among employees by inspiring them. Such leaders behave with an exemplary approach which motivates people to follow them and act accordingly (Çekmecelioğlu & Özbağ: 2016, pp. 243-249). studies have

indicated significant results of transformational leadership (Atmojo: 2015), and the same goes for green behaviors and outcomes (Mittal & Dhar: 2016, pp. 118-127). These studies have concluded that when a leader focuses on a green approach and persona, it can harness green culture and behaviors among employees. In addition to that, green transformation leadership can also help buffer the utilization of green prospects to further green outcomes such as green innovation (Chen et al.: 2012, pp. 368-398; Singh et al.: 2020). This hence led us to assume that green transformational leadership may also help boost the capitalization of green HRM resources to further green innovation. Therefore, we tested the following:

H3: Green transformation leadership will be positively related to green innovation

H4: Green transformation leadership will moderate the relationship between green ability and green innovation

H5: Green transformation leadership will moderate the relationship between green motivation and green innovation.

RESULTS

The study sampled manufacturing firms in the New South Wales region of Australia. A total of 185 small and medium manufacturing enterprises (SMEs) were targeted. Following the footsteps of Singh et al. (Singh et al.: 2020), one of the co-authors visited the firms to distribute and collect the questionnaires. Therein, the Chief operating officers and Chief technical officers were taken to respond to questions about green transformational leadership and HR managers and production managers for green HRM and green innovation factors, respectively. In total, 185 triads of respondents were taken in the present study.

A 6-item scale by Chen and Chang (Chen & Chang: 2013, pp. 107-119) was adapted to examine green transformational leadership. Accordingly, Renwick et al. (Renwick et al.: 2013, pp. 1-14) was considered for green HRM whereby green motivation and green ability were considered. Lastly, innovation, the present study focused on the green production innovation whereby Chen et al. (Chen et al.: 2006, pp. 331-339) four-item scale was adapted. A 7-point Likert scale was used where the respondents rated between strongly disagree (1) to strongly agree (7).

Structural equation modeling using smart PLS 2.0 M3 was used to analyze the data. This technique has been actively used for studies across the globe (Kura et al.: 2019, pp. 472-488). The study followed the two-stage process whereby the most was in connection to its internal consistency reliability, discriminant and convergent validity following the recommendation of Henseler et al. (Henseler et al.: 2009, pp. 277-319) in the first place. In the second stage, the significance of the path coefficients was evaluated.

Pertaining to the assessment of the psychometric properties of the model, the study examined the outer loadings for each of the items to confirm individual item reliability. According to prominent scholars (Leal-Rodríguez et al.: 2015, pp. 803-809; Suarez et al.: 2016, pp. 532-542), loading equal to or greater than 0.70 are considered more reliable and thus, expresses data quality. Table 1 and Figure 1 shows that all item loadings met the recommended threshold except one item from green transformational leadership, which was omitted. Accordingly, composite reliability scores were examined for each of the constructs to ensure the internal consistency reliability of the model. The recommended threshold for CR scores is 0.70 and above. Table 1 shows that all the constructs achieved scores higher than the suggested threshold hence achieving significant internal consistency reliability. In parallel, convergent validity was also examined by assessing the AVE scores for which the suggested threshold is 0.50 and above. The study also achieves considerable convergent validity, as indicated in table 1, whereby AVE scores met the recommended threshold.

Table 1: Loading, Average Variance Extracted, Composite Reliability and R-Square

Construct	Loading	AVE	Composite Reliability	R²
Green Motivation		0.685428	0.91578	
	0.839332			
	0.868144			
	0.848758			
	0.816793			
	0.762525			
Green Ability		0.675845	0.925838	
	0.758058			
	0.805062			
	0.859642			
	0.843926			
	0.861151			
	0.799699			
Green Product Innovation		0.672612	0.8911	0.404205
	0.75259			
	0.781659			
	0.886884			
	0.852351			
Green Transformational Leadership		0.661493	0.907014	
	0.769941			
	0.801622			
	0.844353			
	0.85793			
	0.789354			

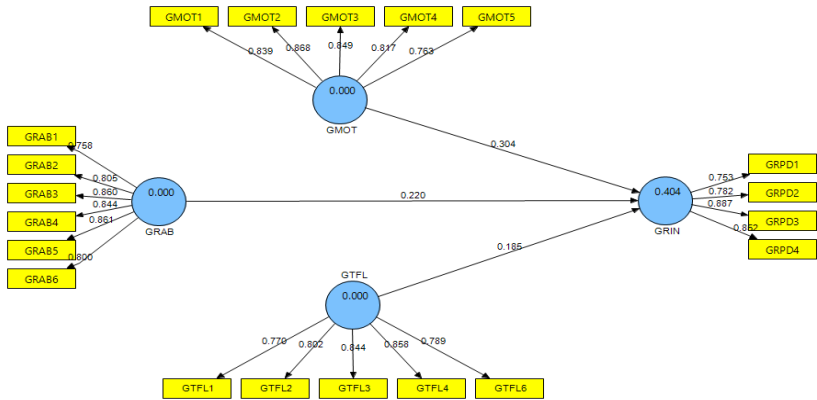


Figure 1: Measurement Model

Scholars have recommended the confirmation of discriminant validity for the holistic assessment of the psychometric properties of the conceptual model. Therein, Fornell and Larcker (Fornell & Larcker: 1981, pp. 39-50) have suggested that the AVE scores for each construct should be greater than 0.50, following which, there should be an assessment done in terms of the square root of these scores against the reflective loadings of other constructs in the cross-loadings table. Here, the square root scores should result in greater value in comparison. Table 2, in this regard, indicates that the model has attained significant discriminant validity as well, thus, fulfilling the assessment criterion of the measurement model stage. The scores have ranged between 0.8133 and 0.8279.

Table 2: Discriminant Validity

Construct	GMOT	GRAB	GRIN	GTFL
GMOT	0.8279			
GRAB	0.7570	0.8220		
GRIN	0.5900	0.5748	0.8201	
GTFL	0.6406	0.6682	0.5277	0.8133

Note: BOLD values are the square root of each construct.

Upon the confirmation of the measurement model, the present study moved to the next stage of analysis whereby, the PLS path model was confirmed. Following the assertions of Haier et al. (2016), the present study tested the direct and moderating links as hypothesized in the study. Through applying bootstrapping procedures with 5000 bootstraps on the sample of 281 cases, figure 2 and table 3 shows that green ability resulted in a significant positive relationship with green innovation ($\beta = 0.236$; $t = 2.933$) hence accepting hypothesis 1. Accordingly, the present study also confirmed the second hypothesized relationship between green motivation and green innovation ($\beta = 0.241$; $t = 3.300$). In parallel, green transformational leadership also posed a significant positive impact on green innovation ($\beta = 0.198$; $t = 3.289$), thus confirming hypothesis 3. Notably, the green transformational leadership also moderated green motivation-green innovation ($\beta = 0.274$; 3.285) and green ability-green innovation ($\beta = 0.151$; $t = 1.647$) relationships consequently, confirming hypothesis 4 and 5.

Table 3: Hypothesis Results

Hypothesis	Beta	Std Error	t-value
GMOT -> GRIN	0.241	0.073	3.300
GTFL -> GRIN	0.198	0.060	3.289
GRAB -> GRIN	0.236	0.080	2.933
GRAB * GTFL -> GRIN	0.151	0.091	1.647
GMOT * GTFL -> GRIN	0.274	0.083	3.285

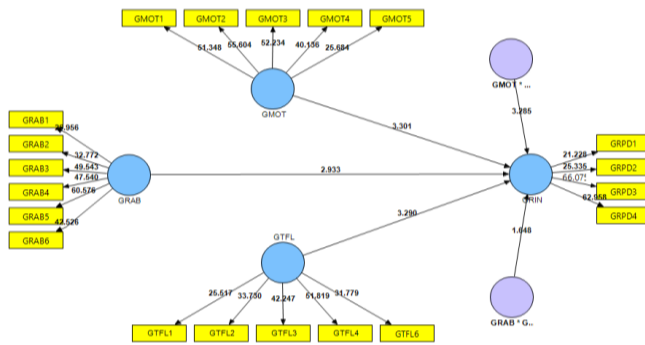


Figure 2: Structural Model

DISCUSSION

The present study has worked to empirically test noteworthy relationships to help understand innovation and green HR enthusiasts. Based on the explanations of past studies (Singh et al.: 2020), green HR prospects can enhance green behavior. Keeping these arguments in view, the current study tested and found a promising role of green motivation towards harnessing green innovation. This, hence asserts that when an organization offers performance appraisal that caters to the appreciation of green efforts, includes progress on environmental activities, rewards environmental management in and outside the business, and rewards employees for acquiring environmental competencies, it significantly enhances their green innovation. Accordingly, when an organization hires people with environmental concerns, focuses on green staffing processes, provides mandatory environmental training, and provides a conducive work environment to practice green knowledge and skills learned from training, it also results in enhancing green innovation. In other words, these efforts improve employees' contribution in terms of efforts to produce less pollution, consume less energy and resources in their work, and take initiatives to design environmentally friendly products that are easy to recycle simultaneously. The study has advanced literature on the topic (Dranev et al.: 2020, pp. 676-691). These results hence imply that organizations should invest in green HR practices to benefit in the shape of environmental management and product innovation with efficient usage of resources (Singh et al.: 2020).

Likewise, green transformational leaders can also help boost green innovation since they inspire individuals with their green environmental plans, provide a clear environmental vision, and makes employees passionate

about environmental goals, and, above all, encourages employees to think and share green ideas and practices. This forwards alignment to the empirical assertions of Chen and Chang (Chen and Chang: 2013, pp. 107-119) and Zhou et al. (Zhou et al.: 2018, p. 3206). The results, therefore, imply similar to the general significance of transformation leadership towards notable employee behaviors and outcomes (Jiang et al.: 2017, p. 1567), when leaders inspire with green behaviors, it also boosts employees to behave accordingly, thus resulting in green innovation. Henceforth, there are brighter opportunities for transformational style leaders to become effective in green prospects simultaneously.

Notably, the present study found a major scholarly gap and therefore attempted to test the moderation of green transformation leadership on the green HRM factors and green innovation. The study reported significant moderation of green transformation leadership on green motivation and green ability's relationship with green innovation. Hence, it suggests that when organizations have leaders who inspire green initiatives, goals, vision, and facilities employees accordingly, it results in employees becoming more capable of capitalizing on the green motivation and green ability acquiring at the workplace to enhance green innovation. The authors could not trace any studies outlining the moderating potential of green transformational leadership. Hence, the present study forwards notable results for leadership and environmental enthusiasts. Transformational leaders have a great deal of potential to influence individuals and in shaping the desired behaviors (Hackett et al.: 2018, pp. 617-644). This implies for organizations to consider developing green competence across the top leadership to infuse green behaviors among the employees.

CONCLUSION

The present study has forwarded several implications for practice. The findings suggest organizations strive for green innovation through developing green HR practices. Herein, a lot has to do with organizational policies (Ahmad: 2015) and the development of green culture in totality to develop a sense of green innovation across the business. On a practical note, the findings also imply manufacturing firms to consider looking into practices that could help them boost and/or strengthen these relationships. Strategically, the development of supportive culture (Gürlek & Tuna: 2018, pp. 467-491) in this regard would be much needed to ensure the maintenance of green HR, green leadership, and green innovation to sustain. This would also be essential for them to remain competitive in the long run.

Several points for scholars to consider in the future can be underlined. At first, the present study was conducted in the manufacturing sector in the manufacturing sector of New South Wales, Australia. This hence limits the generalization of the results. Therefore, future studies are suggested to consider looking into other regions and/or other sectors such as service businesses and so on. In parallel, the study sampled managerial staff members for the predictor variables and chief operating officers for the green transformational leadership variable. Future studies may consider broadening the sample and target population to bring in views of non-managerial employees as well. The study also suggests considering testing the mediating effect of green transformational leadership, and others may also consider investigating the vitality of other leadership styles across diverse business sectors.

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UMAIR AHMED: educationist with a doctorate in human resource management. His area of specialization in research is general HRM with a particular focus on employee well-being. Dr. Umair has a track record of publishing high impact scholarly work in journals of repute. Besides, he has also authored several book chapters. Recently, Dr. Umair also published a book on training and development. He also holds intellectual property rights of the 'engagement strategy framework' which he developed to help organizational scholars and practitioners effectively categorize and examine factors that can influence employees' work engagement. He is also Co-founder and lead trainer of the Institute for Professional and Academic Development (IPAD) that offers soft skills training for academicians and corporate professionals. Currently, he is serving as Assistant Professor of Business Administration and Vice Chair Scientific Research Council at Arab Open University Bahrain.

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