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Article

Sustainable university development through sustainable human resources and corporate entrepreneurship: The role of sustainable innovation and work environment

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SUSTAINABLE UNIVERSITY DEVELOPMENT THROUGH SUSTAINABLE HUMAN RESOURCES AND CORPORATE ENTREPRENEURSHIP: THE ROLE OF SUSTAINABLE INNOVATION AND WORK ENVIRONMENT

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Abstract

Objective of the current study is to examine the role of sustainable human resource (HR) and corporate entrepreneurship on sustainable university development in Poland. The role of sustainable innovation and environment is also examined. For this purpose, data were gathered by using a questionnaire survey. Questionnaires were distributed among the employees of universities in Poland. In addition, cluster sampling was used for data collection. For data analysis, Structural Equation Modelling (SEM) was used through Partial Least Square (PLS). Results of the study revealed that sustainable HR and corporate entrepreneurship has significant role to enhance university sustainability through sustainable innovation. It is found that sustainable HR and corporate entrepreneurship has positive effect on sustainable innovation which leads to the sustainable university development. Moreover, working environment among the universities also has important role to enhance university sustainability through sustainable innovation activities. The study findings have significance for policy-makers as it clearly emphasizes on sustainable HR and organizational entrepreneurship's critical role in the successful implementation of innovation activities to enhance sustainable university development.

Keywords: sustainable university development, sustainable HR, corporate entrepreneurship, sustainable innovation, environment.

JEL Classification: I23, Q55, Q56.

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Introduction

The changes in Polish society as well as economy in the previous two eras have been as central as the variations in higher education system. The development in the percentage of the population with higher education, as demonstrated by the variance between 25-34 years old (43% in 2015) and 55-64 years old (14%), was the greatest change carried by the expansion of the Polish higher education organisations following 1989 (Kwiek and Szadkowski, 2018). This considerable generational variance in qualification levels displays the scale of change in tertiary education between the communist era of the 1980s as well as the massification era in the post-1989 period.

In Poland, massification trend is the key point for understanding the significant phenomena that formed the higher education institutions. The rise as well as fall of student enrolments within the universities is therefore a background of Polish higher education (Kwiek and Szadkowski, 2018). This education system is the backbone of nation's growth. As the education is the key for development activities among all nations (Adeniyi and Aderogba, 2019; Smutná, 2010), for the economic growth, higher education through universities has a key role. Therefore, this study is also one of the attempts to promote sustainable university development with the support of various practices.

There are several studies available in the literature, which considered the education sector (Cervinkova and Rudnicki, 2019; Pietrzak, Pietrzak and Baran, 2016). However, these studies did not examine various factors which influence sustainable university development. Thus, this study examines the role of sustainable HR and corporate entrepreneurship on sustainable university development. Sustainable HR and corporate entrepreneurship have a positive role in enhancing sustainable innovation, which leads to the sustainable university development. Various studies found that corporate entrepreneurship has a positive role in innovation activities (Pawliczek et al., 2015; Lakner et al., 2019) as well as employment possibilities for others (Greblikaite et al., 2015). Additionally, sustainable HR has a positive connection with innovation (Lee, Wu and Tseng, 2018) which lead to the university growth. Moreover, working environment among the organizations also influences innovation and sustainable university development.

Therefore, the objective of the current study is to examine the role of sustainable HR and corporate entrepreneurship on sustainable university development in Poland. Figure no. 1 is the theoretical framework of the study showing the relationship between sustainable HR, corporate entrepreneurship, sustainable innovation, environment and sustainable university development. Furthermore, the sub-objectives of the study are as follows:

- To examine the mediating role of sustainable innovation.
- To examine the moderating role of environment.

The current study is based on seven major sections. First section of the study is based on introduction which highlights the motivation of the study. Second section is based on literature review. The relationship among variables is developed in this section with the help of previous studies. Third section of the study is grounded on research method in which various aspects are highlighted such as data collection, sample size, measures of variables and survey questionnaire. Fourth section includes data analysis with the help of Partial Least Square (PLS). Fifth and sixth section is based on the conclusion and study implications, respectively. Section seven highlighted the limitations and future directions.

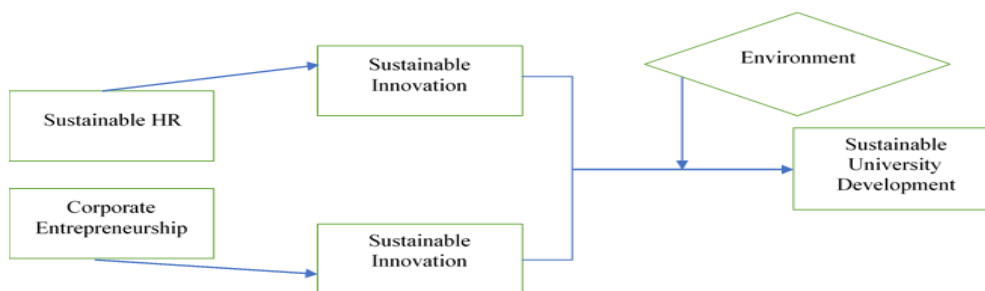


Figure no. 1: Theoretical framework of the study showing the relationship between sustainable HR, corporate entrepreneurship, sustainable innovation, environment and sustainable university development

1. Review of literature and hypotheses development

1.1 Sustainable HR and sustainable innovation

Sustainable HRM can be described as the pattern of planned or emerging HR strategies as well as practices intended to enable the achievement of financial, social and ecological goals while simultaneously reproducing the HR base over a long term. Sustainable HR has most significant importance for organizations (Chams and García-Blandón, 2019; Sukalova and Ceniga, 2020) which lead to the innovation and success.

In the recent decade, the number of articles published on sustainable HR is increasing including several perspectives of the organization. Sustainable HR is considered one of the most important elements of every organization (Chams and García-Blandón, 2019) having significant role in various activities of the organization. It has considerable impact on the sustainability of the education sector. Particularly, in higher education institutions, it has an important role in sustainable university development. Sustainable HR has a growing importance and gained interest of scholars. Most of the scholars examined the way sustainable HR can affect the relationship between customer satisfaction and innovation (Galleli, Hourneaux Jr and Munck, 2019).

Swanson (1995) describes the relationship between HR practices and innovation to create organization expertise for business goals, one of them being innovating performance. Companies can classify and implement the group of strategic HR practices to stimulate the inclination and motivation in employees to involve them in implementing these practices (Ogbeibu et al., 2020). Therefore, HR practices have significant role in innovation activities. Increase in sustainable innovation has the ability to increase innovation activities of the organization which lead to the higher performance. Ehnert and Harry (2012) adopt the main concept of sustainability, which represents the relationship between financial results and sustainability. This concept is actually presented by various other scholars based on efficiency-innovation approach. The author argues that the purpose of understanding efficiency and innovation is either to minimize expenditures (cutting costs) or to maximize the “resource efficiency” through innovation. Therefore, sustainable HR has important role in innovation activities (Manzoor et al., 2019; Singh et al., 2020).

Furthermore, various researchers work to identify the relationship between performance and innovation is based on organizational factors, like policies and HR practices implemented. It is described that interaction between employees and customers during service delivery is very crucial due to customer experience, this recommends that the growth and consistency of service sector depend upon innovative services (Belas et al., 2014).

Various scholars of universities who initiate entrepreneurial activities to demonstrate the direct relation among innovation performance and human resources (Meyer and Synodinos, 2019; Meyer and De Jongh, 2018). Enhanced innovative performance might be the outcome of “experience” generating from the collaboration between the groups of human capital of a firm. The structure of the organization especially its HR practices will affect involvement of human capital towards innovative performance. As there is a significant link between HR practices and innovation performance (Waheed et al., 2019). Organizations that believes on proactive and innovative approach regarding sustainability strategies. These companies are indented to go out of rigid compliance and anticipate that these practices as an element of their culture and competitive strategies in the scope of sustainability. In this situation, sustainability definitely considered as a significant element in competitive environment. Same is with innovation in sustainability. Either innovation is radical or incremental both are the elements of organizational orientation. It also increases the employee satisfaction which lead to the performance (Hussain et al., 2013).

It is evident that sustainability and employment make a significant relationship by an innovative sustainable HR system. It is described that, as employee relations are concerned with the attraction as well as incorporation of potentially well qualifies employees. “Employer branding” to achieve sustainability would be appropriate in such situation (Lopez-Cabralas and Valle-Cabrera, 2019). In firms, innovation is frequently desired competence that needed appropriate guidance, appropriate working environment and reward system with other “target application programs”. Literature argues on other competencies; innovation is also very essential to pinpoint that it must be connected to sustainability or organizational goals. It is necessary for the organizations to achieve sustained competitive advantage through organizational innovation in which sustainable HR is important to consider. Various studies also investigated that sustainable HR has positive link with innovation (Lee et al., 2018). Therefore, the below hypothesis is proposed.

H1. Sustainable HR has positive role to enhance sustainable innovation.

1.2 Corporate entrepreneurship and sustainable innovation

In order to attain and secure global competitiveness, growth for the business as well as its survival the businesses are being forced by the economic and environmental changes to nurture their entrepreneurial environments (Rogalska, 2018). It is a continuous need to research and identify the factors that could potentially contribute in the development and growth of entrepreneurial ventures (Dvorský et al., 2019). Supporting this notion, Barrett and Weinstein (1998) have argued that business leaders more often fail in identifying the factors that can foster performance. In order to nurture entrepreneurial environment organizations, require practicing entrepreneurial behaviours and processes, therefore, a more comprehensive understanding of entrepreneurial behaviours is required (Altaf et al., 2019) which has the ability to foster sustainable innovation.

According to Wood et al. (2008), entrepreneurial behaviours could be named as corporate entrepreneurship. The adoption and spread of corporate entrepreneurial behaviours have positive influence over development. This argument in particular helps researchers in understanding that corporate entrepreneurship could potentially enhance the value of a firm. This could also be learnt from above arguments that businesses could only respond back to changing marketplace by embracing corporate entrepreneurial practices. Further to this, one can understand from above arguments that institutions could only get first-mover advantage by practicing corporate entrepreneurship as the entrepreneurial spirit is thought to be very essential to grow economically with the help of innovation. Above all only those institutions have succeeded in creating dynamic climate that have been innovative into their practices, have proactively responded to the market changes and have also a high level of willingness in adopting risk-taking approaches through innovation (Oláh et al., 2019). Therefore, for this reason it is essential to understand the basic phenomenon of corporate entrepreneurial practices. Essentially, the term entrepreneurial behaviour is related with both individuals as well as the educational institutions; one could easily visualize and identify entrepreneurial behaviour in a given environment. As according to prominent scholars, the concept of corporate entrepreneurship is identified as a necessary component of organizational culture for enhancing value creation (Jennings and Lumpkin, 1989). It is evident from various studies that traditional entrepreneurship as well as corporate entrepreneurship has significant role in innovation activities which has an indirect impact on economic growth development (Boone et al., 2019; Meyer and Meyer, 2017).

The interest of the present study is to investigate the role of corporate entrepreneurship in facilitating sustainable innovation in universities of Poland, therefore, it is essential to look at entrepreneurial behaviour from an institutional level perspective. At the institutional level the concept of entrepreneurial behaviour has been defined in numerous ways; the examples for this include calling entrepreneurial behaviour as intrapreneurship, intercorporate entrepreneurship, corporate venturing, internal corporate entrepreneurship and entrepreneurial strategy. However, with regards to conceptualization of corporate entrepreneurship there are differing opinions over it. In the same vein, Shrader, Oviatt and McDougall (2000) have argued that corporate entrepreneurship consists of three components that include proactiveness, risk taking, and innovativeness.

Proactiveness refers to the future anticipation of a firm regarding its needs and wants, to make a best utilization of its resources for the introduction and creation of new products and services innovation. This is essential due to the fact that organizations are run on the desire to gain first mover advantage. Secondly, literature has suggested that risk-taking is a behaviour of an organization that is to undertake or invest in anything (for example technologies) which has not been tried before (Miller and Friesen, 1982). Further to this, this attempt requires enough capital investment and interestingly the cost of failure for this investment is also equally high as of its cost for success. Lastly, innovation refers to a firm's behaviour of having a higher degree of the willingness to change and adopt new technologies and practices. In whole innovation process, entrepreneurship is key to the success (Boone et al., 2019).

Apart from the above conceptualization of corporate entrepreneurship, which ended on operationalizing corporate entrepreneurship with three determinant factors, researcher like corporate entrepreneurship as "entrepreneurial behaviour inside established mid-size and

large organizations”. Accordingly, Heavey and Simsek (2013) have also agreed to the above notion, stating that corporate entrepreneurship is impressive way to renew small as well as large organizations. As it has positive role in sustainable innovation practices. The similar kind of supported could further be sought in the work of Bierwerth et al. (2015) according to them the role of corporate entrepreneurship pertaining to fostering business performance is very fundamental. Further to these elaborations, while practicing corporate entrepreneurship the businesses could effectively gain the strategic and financial benefits. These statements suggest that the role corporate entrepreneurship is and has remained very essential in promoting sustainable development among universities through innovation. Organizations either medium or small have been considering corporate entrepreneurship in the past. However, on these lines it could further be stated that the intention of universities in implementing corporate entrepreneurship have been observed differently in the past literature. To one end, the practice of corporate entrepreneurship has been enforced into institutions due to the intention of gaining objective performance. The improvement in objective performance suggested that these institutions were more inclined towards increasing profitability, return on sales (ROS), and return on assets (ROA). Therefore, corporate entrepreneurship has important role in universities development and innovation activities. Various studies found that corporate entrepreneurship has positive role in innovation activities. Therefore, from the above discussion, the following hypothesis is proposed.

H2. Corporate entrepreneurship has positive role to enhance sustainable innovation.

1.3 Sustainable innovation and sustainable university development

With the passage of time, the term innovation is used with special meanings in assorted positions. It is commonly related to elements inclusive of creativity, originality, creating better value for businesses and financial boom (Moore and Birtwistle, 2008). Now it has significant importance in all organizations (Mousavi, Bossink and van Vliet, 2019). Nowadays, innovation has become the most essential factor for commercial enterprises in the rapid competition of international markets (Century, Reuber and Ratcliffe, 2008).

According to Ericsson and Charness (1997), for making innovations in services, corporations may have to strengthen its HR to develop organizational proficiencies. Though it is very difficult to attain these proficiencies because firstly planned practices in specific area is much important for it. To improve overall performance individuals trying to carry out the responsibilities for implementing these practices which lead to sustainable university development. For attaining rapid growth and for upgrading bottom-line results, innovation is the key factor. Previous studies also highlighted that sustainable innovation has positive role in sustainable education development. As the innovation in universities has key important for development. It is also evident from previous studies that sustainable innovation has positive effect on universities (Perello-Marín, Ribes-Giner and Pantoja Díaz, 2018). Therefore, the current study proposed the following hypotheses:

H3. Sustainable innovation has positive role to enhance sustainable university development.

H4. Sustainable innovation mediates the relationship between sustainable HR and sustainable university development.

H5. Sustainable innovation mediates the relationship between corporate entrepreneurship and sustainable university development.

1.4 Environment

The term work environment is used to explain the surrounding different conditions in which an organizational employee operates. The work environment could be composed of physical conditions, including as office temperature, or equipment, personal computers etc. It could also be related to factors such as work procedures. Moreover, work environment also includes the management involvement.

The term work environment is used to designate the nearby conditions in which an employee work. The work environment could be composed of physical conditions, including office temperature, or equipment, such as personal computers. It could also be related to factors such as work procedures. It has significant importance in various organizations (McSherry and Pearce, 2018). In any organization, working environment has significant role in the performance of employees. Supportive working environment always lead to the better employee performance (Boles et al., 2001). However, unfriendly environment has negative role to promote organization activities. Particularly, in a supportive working environment, employee's development of new innovative ideas which lead to the sustainable university development. It is clear from previous studies that work environment has important role in innovation activities (Vos and van der Voordt, 2002) which lead to the sustainable university development. Thus, from the above discussion, the following hypotheses are proposed.

H6. Environment has a positive role to enhance sustainable university development.

H7. Environment moderates the relationship between sustainable innovation and sustainable university development.

2. Research method

2.1 Research design

Nature of the study is always important to select the appropriate research design. The cross-sectional research design was adopted in this study under which the data for the whole study was collected once. Questionnaire was designed in order to obtain information from the respondents. Apart from the benefit of collecting data from a large sample size, the survey method gives an advantage in terms of saving time and cost (Leedy and Ormrod, 2005). The survey method takes less time of the respondents as compare to interview method. Apart from that, confidentiality is ensured on the respondent's background while quantitative data collection. The survey method allows researchers to collect data, perform analysis, and conduct the reliability and validity tests effectively on the instrument.

2.2 Population of the study

Population of the study is the universities of Poland. Data were collected from the universities three middle size universities of southern Poland: Czestochowa University of Technology (students number: 6963; academic staff: 840), Opole University of Technology

(students number: 6203; academic staff: 507), WSB University in Dąbrowa Górnicza (students number: 1300; academic staff: 148). The employees of these universities were selected to collect the primary data. This was followed by data analysis and statistical interpretations while drawing conclusions or making inferences about the selected population of the study at one point in time.

2.3 Sample size

While using a survey, 382 questionnaires were distributed among the employees of Poland universities in Spring 2019. From these distributed questionnaires, 185 valid responses were returned and used for data analysis. The participation of the respondents according to their position were as follows:

Czestochowa University of Technology

Professors: 24 Other didactic staff: 43 Technical and administrative staff: 13

Opole University of Technology

Professors: 11 Other didactic staff: 52 Technical and administrative staff: 10

WSB University in Dąbrowa Górnicza

Professors: 7 Other didactic staff: 22 Technical and administrative staff: 3

2.4 Sampling technique

Moreover, area cluster sampling was preferred to distribute the survey questionnaires among the university employee in Poland. All the questionnaires were distributed through self-visit to the universities. Before to distribute the questionnaires, objective of the study was explained, and it was insured that the response will remain confidential.

2.5 Questionnaire

Questionnaire was divided in to two major sections. The first section of the questionnaires was based on the profile of respondents which include: gender, age, education, income and marital status. Second section was based on the key research questions related to the major variables of the study. Moreover, Likert scale was used in this study to collect the data from university employees. Finally, all the measures were adapted from previous studies. Sustainable HR and corporate entrepreneurship are measured in a way that how they affect or promote sustainable innovations. Sustainable innovation is measured based on new ideas towards the sustainable university development. Working environment is measured based on the physical environment and role of management. University sustainable development is measured and defined as sustainable university is an educational institution that educates citizens for sustainable development, provide relevant insights on urgent societal challenges and decreases the environmental as well as social footprints of its campus operations.

3. Analysis and findings

Data screening is one of the important elements of every study. Because, any mistake in the data may lead to the different results. Therefore, this study examined the collected data to resolve the issues of missing value and outlier. Data screening results showed that data has no missing value and free from any case of outlier. In addition, normality of the data is also

highlighted (see Derevianko, 2019), however, while using the PLS-SEM, normality has no issue as PLS is one of the suitable tools to handle non-normal data (Henseler, Ringle and Sinkovics, 2009). After data screening, confirmatory factor analysis (CFA) was carried out to examine the reliability and validity of the data. The factor loading is given in Figure no. 2 which shows that all the items have factor loadings above minimum threshold level which is 0.7 (Hair et al., 2017). Moreover, composite reliability (CR) and average variance extracted (AVE) is given in Table no. 1 which also above threshold level, 0.7 and 0.5 respectively (Hair et al., 2017). Finally, discriminant validity is achieved by examining Heterotrait-Monotrait Ratio of Correlations (HTMT), which is given in Table no. 2.

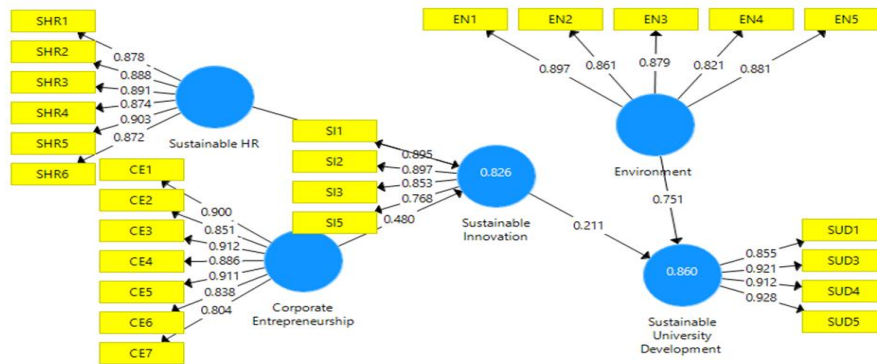


Figure no. 2: Confirmatory Factor Analysis (CFA)

Table no. 1: Construct Reliability and Validity

	Alpha	rho_A	CR	AVE
Corporate Entrepreneurship	0.947	0.949	0.957	0.761
Environment	0.918	0.919	0.939	0.754
Sustainable HR	0.944	0.945	0.956	0.782
Sustainable Innovation	0.876	0.877	0.915	0.731
Sustainable University Development	0.925	0.927	0.947	0.818

Table no. 2: Heterotrait-Monotrait Ratio of Correlations (HTMT)

	SUD	SHR	CE	SI	EN
Sustainable University Development					
Sustainable HR	0.723				
corporate Entrepreneurship	0.652	0.374			
Sustainable Innovation	0.712	0.625	0.521		
Environment	0.521	0.632	0.402	0.562	

PLS structural model was used to test the hypotheses (Pilelienė and Grigaliūnaitė, 2017). In this study total seven hypotheses were proposed. Two hypotheses were based on the mediation effect of sustainable innovation. One hypothesis was examined based on the moderating effect of working environment. Four hypotheses were based on the direct effect of sustainable HR, corporate entrepreneurship, sustainable innovation and working

environment. Minimum level of t-value 1.96 was considered to accept or reject the hypotheses. Table no. 3 shows the direct effect. It is found that sustainable HR, corporate entrepreneurship, sustainable innovation and working environment has significant positive effect on sustainable university development. Thus, H1, H2, H3 and H6 are supported. Additionally, Figure no. 3 shows the structural model assessment.

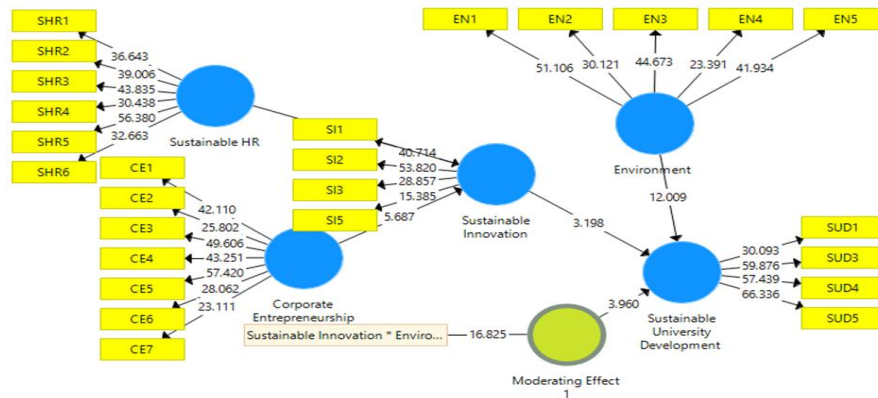


Figure no. 3: Structural Model

Table no. 3: Direct Effect and Moderation Effect Results

	β	M	SD	T Statistics	P Values
Corporate Entrepreneurship -> Sustainable Innovation	0.48	0.469	0.084	5.687	0
Environment -> Sustainable University Development	0.784	0.779	0.065	12.009	0
Moderating Effect 1 -> Sustainable University Development	0.073	0.074	0.018	3.96	0
Sustainable HR -> Sustainable Innovation	0.454	0.465	0.083	5.469	0
Sustainable Innovation -> Sustainable University Development	0.225	0.229	0.07	3.198	0.001

Moreover, moderation effect is highlighted in Table no. 3. It is found that environment moderates the relationship between sustainable innovation and sustainable university development. Figure no. 4 also shows the moderation effect which indicates that environment as a moderating variable strengthen the positive relationship between sustainable innovation and sustainable university development. Therefore, H7 is supported by the results. Furthermore, indirect effect of sustainable innovation is also significant in both causes. Thus, H4 and H5 are supported. It is given in Table no. 4.

Table no. 4: Indirect Effect Results

	β	M	SD	T Statistics	P Values
Corporate Entrepreneurship -> Sustainable Innovation ->	0.108	0.11	0.044	2.433	0.015

Sustainable University Development					
Sustainable HR -> Sustainable Innovation -> Sustainable University Development	0.102	0.105	0.033	3.117	0.002

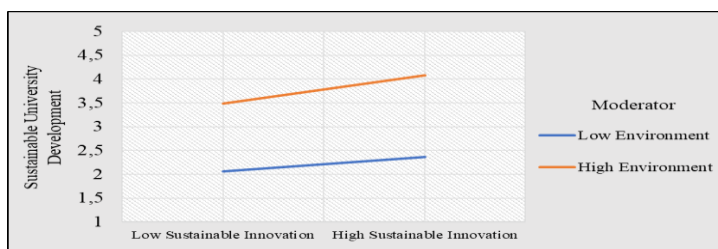


Figure no. 4: Moderating effect of environment strengthen the positive relationship between sustainable innovation and sustainable university development

The results from the mediating and moderating variables provide a blueprint in order to develop strategic plans for structuring university in order to ensure sustainable development. This is particularly of importance given that the literature documents unsustainable patterns amongst university structures (Van Weenen, 2000). In addition, the evidence from the current study provides further support for the need for professional development via educating the educators in order to ensure sustainable development of universities as suggested in the literature. Furthermore, it provides additional aspects which can be included in the education for sustainable development agenda in the full implementation process (Holm et al., 2015).

4. Conclusion

Objective of the current study was to examine the sustainable HR and corporate entrepreneurship on university sustainability in Poland. The role of sustainable innovation and environment was also examined. For this purpose, data were gathered by using a questionnaire survey and analysed by using the Partial Least Square (PLS). Results of the study revealed that sustainable HR has significant role to enhance university sustainability through sustainable innovation. It is found that sustainable HR has positive effect on sustainable innovation. Increase in sustainable HR increases the innovation among universities which effect positively on sustainable university development. These results are also consistent with other previous studies. The Paradox theory also creates links between HR and sustainability as described by Ehnert and Harry (2012). Generally, sustainable HR lead to the innovation and finally innovation lead to the university sustainability. Various scholars of universities who initiate entrepreneurial activities to demonstrate the direct relation among innovation performance and human resources (Meyer and Synodinos, 2019; Meyer and De Jongh, 2018).

Therefore, universities should promote HR activities to boost innovation. In the same direction, results of the study highlighted consistent results in case of corporate entrepreneurship. In line with sustainable HR, it is found that corporate entrepreneurship has positive effect on sustainable innovation which lead to the sustainable university development. It is also clear from other studies, as it is evident from various studies that traditional entrepreneurship as well as corporate entrepreneurship has significant role in innovation activities which has an indirect impact on economic growth development (Boone et al., 2019; Meyer and Meyer, 2017).

Better corporate entrepreneurship activities have the ability to increase innervational activities among the universities which has positive effect on university sustainability. Therefore, Poland universities should promote sustainable HR and corporate entrepreneurship to enhance university sustainability through sustainable innovations. Moreover, universities should also provide supportive environment to promote innovative activities. Supportive working environment always lead to the better employee performance (Boles et al., 2001). As the working environment has the ability to strengthen the relationship between sustainable innovation and sustainable university development. These results are not only applied on Poland; however, the results of the current study can be applied to all educational institutions.

5. Theoretical and practical implications of the study

This study examined the postulated relationship in the context of sustainable HR, corporate entrepreneurship, sustainable innovation, environmental factors and sustainable university. Most of the studies have examined the proposed conceptualization but there is scarcity of studies conducted in the universities. Therefore, this study could be considered amongst the earliest ones, providing data for future research on how corporate entrepreneurial practices and sustainable HR can stimulate university sustainability. Additionally, the proposed study results will be significant to the practitioners as it focuses on the corporate entrepreneurship's role towards increasing university sustainability. By exploring organizational sustainable innovation as mediator, this study has forwarded that management serving in the education sector require understanding the value of corporate entrepreneurship, sustainable HR and its allied activities in order to achieve higher level of university performance. The study findings have also pushed the idea that responsive organizational entrepreneurship is critical for facilitating corporate entrepreneurship to significantly foster performance and management cannot afford to forgo this component. Moreover, the study findings are also significant for policymakers as it clearly emphasizes on sustainable HR and organizational entrepreneurship's critical role in the successful implementation of innovation activities.

6. Limitations and future research

Although this study covered the most significant theoretical and practical aspects in the concerned area, however, the study has various limitations which could be the future directions. First, the current study is only focused on the Poland education sector, future research could be more beneficial by making the comparison between various other similar

countries. Second, this study is only based on the close ended questions in which respondents cannot provide his or her own views as well as experience. Therefore, future studies should include various open-ended questions to attain more originality in results. Third, this study could not consider all the important factors which effect on sustainable university development. Particularly, organizational culture is an important element which effect on sustainable university development. Thus, future studies should consider organizational culture to study sustainable university development.

References

- Adeniyi, A. A. and Aderogba, K., 2019. Community Education Variables and Rural Development Activities of Community-Based Organisations in Rural Areas of Ogun State, Nigeria. *KIU Journal of Social Sciences*, 5(3), pp.283-292.
- Altaf, M., Hameed, W., Nadeem, S. and Arfan, S., 2019. Successful Entrepreneurial Process as Contributor towards Business Performance in Banking: Moderating Role of Passion for Inventing. *South Asian Journal of Management Sciences*, 13(1).
- Barrett, H. and Weinstein, A., 1998. The effect of market orientation and organizational flexibility on corporate entrepreneurship. *Entrepreneurship theory & practice*, 23(1), pp.57-70.
- Belas, J., Cipovova, E. and Demjan, V., 2014. Current trends in area of satisfaction of bank clients in the Czech Republic and Slovakia. *Transformations in Business and Economics*, 13(3), pp.219-234.
- Bierwerth, M., Schwens, C., Isidor, R. and Kabst, R., 2015. Corporate entrepreneurship and performance: A meta-analysis. *Small Business Economics*, 45(2), pp.255-278.
- Boles, J. S., Babin, B. J., Brashear, T. G. and Brooks, C., 2001. An examination of the relationships between retail work environments, salesperson selling orientation-customer orientation and job performance. *Journal of marketing theory and practice*, 9(3), pp.1-13.
- Boone, C., Lokshin, B., Guenter, H. and Belderbos, R., 2019. Top management team nationality diversity, corporate entrepreneurship, and innovation in multinational firms. *Strategic management journal*, 40(2), pp.277-302.
- Century, K., Reuber, T. L. and Ratcliffe, O. J., 2008. Regulating the regulators: the future prospects for transcription-factor-based agricultural biotechnology products. *Plant physiology*, 147(1), pp.20-29.
- Cervinkova, H. and Rudnicki, P., 2019. Neoliberalism, Neoconservatism, Authoritarianism. The Politics of Public Education in Poland. *Journal for Critical Education Policy Studies (JCEPS)*, 17(2).
- Chams, N. and García-Blandón, J., 2019. On the importance of sustainable human resource management for the adoption of sustainable development goals. *Resources, Conservation and Recycling*, 141, pp.109-122.
- Dabija, D.C., Dinu, V., Postelnicu, C. and Mihăilă, A., 2017. Stakeholders' Perception of Sustainability Orientation within a Major Romanian University. *International Journal of Sustainability in Higher Education*, 18(4), pp.533-553.

- Derevianko, O., 2019. Reputation stability vs anti-crisis sustainability: under what circumstances will innovations, media activities and CSR be in higher demand? *Oeconomia Copernicana*, 10(3), pp.511-536.
- Dvorský, J., Petráková, Z., Zapletalíková, E. and Rózsa, Z., 2019. Entrepreneurial propensity index of university students. The case study from the Czech Republic, Slovakia and Poland. *Oeconomia Copernicana*, 10(1), pp.173-192.
- Ericsson, K. and Charness, N., 1997. *Cognitive and development factors in expert performance. Expertise in Context*. California: AAAI Press.
- Galleli, B., Hourneaux Jr. F. and Munck, L., 2019. Sustainability and human competences: a systematic literature review. *Benchmarking: An International Journal* [e-journal] <https://doi.org/10.1108/BIJ-12-2018-0433>
- Greblikaite, J., Sroka, W. and Grants, J., 2015. Development of social entrepreneurship in European Union: policy and situation of Lithuania and Poland. *Transformations in Business & Economics*, 14(2B(35B)), pp.376-396.
- Hair, J., Hollingsworth, C. L., Randolph, A. B. and Chong, A. Y. L., 2017. An updated and expanded assessment of PLS-SEM in information systems research. *Industrial Management & Data Systems*, 117(3), pp.442-458.
- Heavey, C. and Simsek, Z., 2013. Top management compositional effects on corporate entrepreneurship: The moderating role of perceived technological uncertainty. *Journal of Product Innovation Management*, 30(5), pp.837-855.
- Henseler, J., Ringle, C. M. and Sinkovics, R. R., 2009. *The use of partial least squares path modeling in international marketing. New challenges to international marketing*. S.l.: Emerald Group Publishing Limited.
- Hussain, S., Rizwan, M., Nawaz, M. S. and ul Hameed, W., 2013. Impact of Effective Training Program, Job Satisfaction and Reward Management System on the Employee Motivation with mediating role of Employee Commitment. *Journal of Public Administration and Governance*, 3(3), pp.278-293.
- Jennings, D.F. and Lumpkin, J. R., 1989. Functioning modelling corporate entrepreneurship: An empirical integrative analysis. *Journal of management*, 15(3), pp.485-502.
- Kwiek, M. and Szadkowski, K., 2018. Higher education systems and institutions, Poland. *Encyclopedia of international higher education systems and institutions*.
- Lakner, Z., Kiss, A., Popp, J., Máté, D. and Oláh, J., 2019. From Basic Research to Competitiveness: An Econometric Analysis of the Global Pharmaceutical Sector. *Sustainability* [e-journal] 11(11), 3125, pp.1-17. <https://doi.org/10.3390/su11113125>
- Lee, C.-H., Wu, K.-J. and Tseng, M.-L., 2018. Resource management practice through eco-innovation toward sustainable development using qualitative information and quantitative data. *Journal of Cleaner Production*, 202, pp.120-129.
- Leedy, P. D. and Ormrod, J. E., 2005. *Practical research: Pearson Custom*. S.l.: Pearson.
- Lopez-Cabrales, A. and Valle-Cabrera, R., 2019. Sustainable HRM strategies and employment relationships as drivers of the triple bottom line. *Human resource management review*, 100689.

- Meyer, N. and Synodinos, C., 2019. Entrepreneurial skills, characteristics and intentions amongst unemployed individuals in South Africa. *Journal of Contemporary Management*, 16(2), 1-22.
- Meyer, N. and Meyer, D.F., 2017. An econometric analysis of entrepreneurial activity, economic growth and employment: The case of the BRICS countries. *International Journal of Economic Perspectives*, 11(2), pp.429-441.
- Meyer, N. and De Jongh, J.J., 2018. The importance of entrepreneurship as a contributing factor to economic growth and development: The case of selected European countries. *Journal of Economics and Behavioral Studies*, 10(4), pp.287-299.
- McSherry, R. and Pearce, P., 2018. Measuring health care workers' perceptions of what constitutes a compassionate organisation culture and working environment: Findings from a quantitative feasibility survey. *Journal of nursing management*, 26(2), pp.127-139.
- Miller, D. and Friesen, P. H., 1982. Innovation in conservative and entrepreneurial firms: Two models of strategic momentum. *Strategic management journal*, 3(1), pp.1-25.
- Mousavi, S., Bossink, B. and van Vliet, M., 2019. Microfoundations of companies' dynamic capabilities for environmentally sustainable innovation: Case study insights from high- tech innovation in science- based companies. *Business Strategy and the Environment*, 28(2), pp.366-387.
- Ogbeibu, S., Emelifeonwu, J., Senadjki, A., Gaskin, J. and Kaivo-oja, J., 2020. Technological turbulence and greening of team creativity, product innovation, and human resource management: Implications for sustainability. *Journal of Cleaner Production*, 244, 118703.
- Oláh, J., Virglerova, Z., Klieštiková, J., Popp, J. and Kovács, S., 2019. The Assessment of Non-Financial Risk Sources of SMES in the V4 Countries and Serbia. *Sustainability*, 11(17), 4806, pp.1-19. <https://doi.org/10.3390/su11174806>
- Pawliczek, A., Kozel, R., Vilamová, Š. and Janovská, K., 2015. On the strategic planning, innovation activities and economic performance of industrial companies. *Acta Montanistica Slovaca*, 20 (1), pp.16-25.
- Perello-Marín, M., Ribes-Giner, G. and Pantoja Díaz, O., 2018. Enhancing education for sustainable development in environmental university programmes: a co-creation approach. *Sustainability*, 10(1), p.158.
- Pietrzak, M., Pietrzak, P. and Baran, J., 2016. Efficiency assessment of public higher education with the application of Data Envelopment Analysis: The evidence from Poland. *Online Journal of Applied Knowledge Management*, 4(2), pp.59-73.
- Pilelienė, L. and Grigaliūnaitė, V., 2017. Colour temperature in advertising and its impact on consumer purchase intentions. *Oeconomia Copernicana*, 8(4), pp.657-669.
- Rogalska, E., 2018. Multiple-criteria analysis of regional entrepreneurship conditions in Poland. Equilibrium. *Quarterly Journal of Economics & Economic Policy*, 13(4), pp.707-723.
- Shrader, R. C., Oviatt, B. M. and McDougall, P. P., 2000. How new ventures exploit trade-offs among international risk factors: Lessons for the accelerated internationalization of the 21st century. *Academy of Management Journal*, 43(6), pp.1227-1247.

- Singh, S. K., Del Giudice, M., Chierici, R. and Graziano, D., 2020. Green innovation and environmental performance: The role of green transformational leadership and green human resource management. *Technological Forecasting and Social Change*, 150, 119762.
- Smutná, J. and Farana, R., 2010. Understanding the quality concept in the higher education. *Acta Montanistica Slovaca*, 15 (1), pp.54-57
- Sukalova, V. and Ceniga, P., 2020. Diversity Management in Sustainable Human Resources Management. *SHS Web of Conferences*, 74, p. 01033.
- Swanson, R. A., 1995. Human resource development: Performance is the key. *Human resource development quarterly*, 6(2), pp.207-213.
- Van Weenen, H., 2000. Towards a vision of a sustainable university. *International Journal of Sustainability in Higher Education*, 1(1), pp.20-34.
- Vos, P. and van der Voordt, T., 2002. Tomorrow's offices through today's eyes: Effects of innovation in the working environment. *Journal of Corporate Real Estate*, 4(1), pp.48-65.
- Waheed, A., Miao, X., Waheed, S., Ahmad, N. and Majeed, A., 2019. How New HRM Practices, Organizational Innovation, and Innovative Climate Affect Innovation Performance in IT Industry: A Moderated-Mediation Analysis. *Sustainability*, 11(3), p.621.
- Wood, C. C., Holt, D. T., Reed, T. S. and Hudgens, B. J., 2008. Perceptions of corporate entrepreneurship in air force organizations: antecedents and outcomes. *Journal of Small Business & Entrepreneurship*, 21(1), pp.117-131.