



IMPACT OF EMPLOYEE SUSTAINABILITY KNOWLEDGE ON EMPLOYEE SUSTAINABLE BEHAVIOR: A STUDY OF MANUFACTURING SECTOR AND SERVICE SECTOR EMPLOYEES

Impacto do conhecimento sobre sustentabilidade dos funcionários no comportamento sustentável dos funcionários: um estudo dos funcionários do setor manufatureiro e do setor de serviços

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ABSTRACT

Sustainability has become a key business imperative in the contemporary Industry 4.0 regime. The success of organizations in this VUCA world depends upon sustainable innovations which largely depends on employees understanding of sustainability and resultant sustainable behavior. Many empirical studies have shown the positive impact of employee sustainability knowledge on employee sustainable behavior across the organizations. The organizations need to invest in Corporate Sustainability Training of employees to improve their SDG knowledge in order to drive sustainable behavior. This paper attempts to examine relationship between Employee Sustainable Development Goals Knowledge and Employee Sustainable Behavior among those, working in manufacturing sector and service sector. Impact of gender on employee SDG knowledge and behaviors has also been explored in the study.

Keywords: Sustainability, Industry 4.0, Corporate Sustainability Training, Employee Sustainable Development Goals Knowledge, Employee Sustainable Behavior

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IMPACTO DO CONHECIMENTO SOBRE SUSTENTABILIDADE DOS FUNCIONÁRIOS NO COMPORTAMENTO SUSTENTÁVEL DOS FUNCIONÁRIOS: UM ESTUDO DOS FUNCIONÁRIOS DO SETOR MANUFATUREIRO E DO SETOR DE SERVIÇOS

*Impact of employee sustainability knowledge on employee sustainable behavior: a study of manufacturing sector
and service sector employees*

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RESUMO

A sustentabilidade tornou-se um imperativo comercial fundamental no regime contemporâneo da Indústria 4.0. O sucesso das organizações neste mundo VUCA depende de inovações sustentáveis, que dependem em grande parte da compreensão dos funcionários sobre sustentabilidade e comportamento sustentável resultante. Muitos estudos empíricos mostraram o impacto positivo do conhecimento sobre a sustentabilidade dos funcionários no comportamento sustentável dos funcionários em todas as organizações. As organizações precisam investir em Treinamento de Sustentabilidade Corporativa dos funcionários para melhorar seus conhecimentos sobre os ODS, a fim de impulsionar um comportamento sustentável. Este artigo tenta examinar a relação entre o Conhecimento dos Objetivos de Desenvolvimento Sustentável dos Funcionários e o Comportamento Sustentável dos Funcionários entre aqueles que trabalham no setor manufatureiro e no setor de serviços. O impacto do gênero no conhecimento e nos comportamentos dos ODS dos funcionários também foi explorado no estudo.

Palavras-chave: Sustentabilidade, Indústria 4.0, Treinamento em Sustentabilidade Corporativa, Conhecimento dos Objetivos de Desenvolvimento Sustentável dos Funcionários, Comportamento Sustentável dos Funcionários

INTRODUCTION

In the age of Industry 4.0, Sustainability has become a major issue at hand across the global market. Organizations lacking sustainability know how may have to suffer huge financial losses along with loss of market reputation (Jamwal et al., 2021).

Many empirical studies have highlighted the role of sustainability as a pillar of smart factories. It has assumed center stage to an extent that is said that the success of organizations in future depends upon the extent to which they are able to handle sustainability challenges effectively. Thus, organizations are forced to reinvent the ways to serve customers in sustainable ways (Severo et al., 2020). Corporate sustainable Innovation is the key to organizational success which in turn depends on the employees (Delmas & Pekovic, 2018). The major challenge before the organizations is to explore the ways to engage the employees beyond statutory compliance and bring attitudinal change. Organizations need to invest in employee training to drive sustainable innovation (Ketata et al., 2015).

This paper attempts to examine SDG Knowledge and behavioral differences of employees working in manufacturing sector and service sector. Impact of gender on employee SDG knowledge and behaviors has also been explored in the study.

1 GENDER AND SUSTAINABILITY

Many studies have investigated the gender differences influence of gender on sustainable lifestyles.

Research suggest that females possess strong pro-environment attitude, concern and behavior as compared to males (Scannell & Gifford, 2013). A study undertaken in 14 countries in US, Latin America and Europe also revealed similar gender difference in terms of pro-environment attitude and behaviors (Zelezny, Chua, & Aldrich, 2000). Females tend to get more upset about anti-environment activities and events happening around but they possess lower knowledge pertaining to environmental issues as compared to their male counterparts (Levine & Strube, 2012). Similar findings have been noted by other studies as well with respect to lower awareness among females about environmental issues (Stern et al., 1993). There exist the relationship between gender identity of the people and their know how of environment (Tikka et al., 2000). Women exhibit willingness to pay more for eco-friendly products but show lower participation in environmental activities across European countries (Torgler, 2008). As far as private environmental behavior is concerned women outdo their male counterparts however no significant gender differences have been found in their public environmental behavior (Hunter et al., 2004).

However, a study conducted in China reported a reverse trend where females exhibited lower environmental concerns than males (Xiao & Hong, 2010). No significant gender difference is found so far as anxiety about global environment problems is concerned (Xiao & McCreight, 2010).

2 SUSTAINABILITY KNOWLEDGE AND SUSTAINABLE BEHAVIOR

Any behavioral change is the result of learning. Learning about a situation develops the motivation in an individual for making the change (Kilvington & Allen, 2001). Environmental knowledge can be classified into two types namely procedural knowledge and informational interventions. Awareness and understanding of recycling materials, methods and disposal processes significantly impacts pro-environment employee behavior. Those employees who have the knowledge of their organization's waste management practices are found to be indulging in more sustainable behaviors (Tudor et al., 2008). Individual's awareness and attitude towards environmental hazards encourage them to indulge in pro environment behaviors (Poortinga et al., 2004). These pro environmental actions may take the form of recycling actions (Schultz and Oskamp, 1996) and green electricity adoption (Ozaki, 2011). A case study on manufacturing company operating in construction sector found that interventions to raise environmental awareness and staff training for environmental performance resulted in recycling behaviors among the employees (Jones et al., 2012). Another case study of Canadian chemical industry reported that environmental performance was more likely to be improved if the operators were sensitized about their duties pertaining to environment (Boiral, 2005). A case study on Public School District that compared the electricity usage among two schools found that one of them was able to reduce its electricity use by 50% over several years by driving its staff

to indulge in sustainable behaviors through consistent reminders to turn off the lights and computers (Schelly et al., 2011).

Some empirical studies have established the relationship between individual’s knowledge about sustainability and sustainable behavior. Sustainability knowledge of learners gets improved with the help of Education for sustainable development programs which results in transformative behaviors (Alsaati et al., 2020). Environmental education imparted either in formal or informal setting goes a long way in improving environmental skills, awareness, and behavior of the learners.

Existing literature has shown the positive impact of employee sustainability knowledge on employee sustainable behavior across the organizations .However no studies have made a direct comparison of employee sustainability knowledge on employee sustainable behavior across manufacturing sector and service sector employees. Furthermore, few studies have included gender as an indicator of employee sustainability awareness and behaviors. This study attempts to address these research gaps.

3 RESEARCH METHODOLOGY

The present study is based upon cross sectional survey research design. The data for the study was collected from 271 respondents working in manufacturing and service sector organizations serving as entry level to mid – senior level executives. The respondents were selected using non-probability convenience sampling method. There were 51 percent male and 49 percent female respondents. The questionnaire used for data collection consisted of eight items adapted from (Zamora-Polo et al. ,2019) that measured SDG know- how of the respondent’s while

seventeen items measuring the employee sustainable behavior were adapted from (Gericke et al. ,2019). All the questions were answered using five-point Likert scale ranging from 1 (“Strongly disagree”) to 5 (“Strongly agree”). The questionnaire was distributed online using google forms. Reliability for each construct was assessed using Cronbach’s alpha which was 0.946 for SDG Knowledge and 0.975 for Employee Sustainable Behavior. High level of internal consistency was found between the items of construct as Cronbach’s alpha value is higher than cut off value which is prescribed as 0.7.

4 RESULTS

Analysis of Table 1 reveals the average level of employee understanding towards sustainability as indicated by the means scores of Sustainable Development Goals knowledge is 28.42 (sd. 6.88) and that of Employee Sustainable Behavior is 62.42 (sd. 14.6). The total scores for Employee SDG knowledge and employee sustainability behavior were 38 and 82, respectively. Significant gap can be seen between minimum and maximum value of the employee’s knowledge of Sustainable Development Goals and sustainable behavior.

Table 1 - Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior

Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior						
Variables	N	Minimum	Maximum	Mean	Std. Deviation	Variance
Employee SDG Knowledge	271	18.00	38.00	28.42 44	6.88051	47.341
Employee Sustainable Behavior	271	38.00	82.00	62.44 65	14.62557	213.907

4.1 Employee SDG Knowledge and Employee Sustainable Behavior between Genders

Gender wise comparison of mean scores for Employee Sustainable Development Goals Knowledge revealed no significant difference between males and females with mean difference of 0.24 as per Table 2. The gender wise comparison of mean scores for Employee Sustainable Behavior also yielded similar results. No significant difference between males and females was found with respect to sustainable behavior with means difference of 0.47.

Table 2 - Gender wise Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior

Gender wise Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior				
Variables	Gender	N	Mean	Std. Deviation
Employee SDG Knowledge	Male	137	28.3066	6.68686
	Female	134	28.5448	7.09613
Employee Sustainable Behavior	Male	137	62.1971	14.88675
	Female	134	62.7015	14.40501

4.2 Employee SDG Knowledge and Employee Sustainable Behavior between Sectors

Analysis of Table 3 reveals the sector wise mean scores of Employees Sustainable Development Goals Knowledge which for manufacturing employees stands at 29.82 (sd.6.51) and for Service sector employees is calculated as 27.05(sd.6.97). Thus, manufacturing sector employees possess more knowledge regarding Sustainable Development Goals as compared to service sector employees with mean difference of 2.77.

As far as sector wise mean scores of Employees Sustainable Behavior are concerned, manufacturing sector employees stand at 64.87 (sd.14.37) and service sector employees at 60.05 (sd.14.56). Thus, manufacturing sector employees demonstrate more sustainable behavior as compared to service sector employees with a mead difference of 4.82.

Table 3 - Sector wise Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior

Sector wise Descriptive Statistics – Employee SDG Knowledge and Employee Sustainable Behavior				
Variables	Sector	N	Mean	Std. Deviation
Employee SDG Knowledge	Manufacturing	134	29.8209	6.51759
	Service	137	27.0584	6.97450
Employee Sustainable Behavior	Manufacturing	134	64.8955	14.32662
	Service	137	60.0511	14.56896

4.3 Employee SDG Knowledge and Employee Sustainable Behavior between Sectors and genders

In order to determine whether any statistically significant sectoral and gender-based differences exist among employees in terms of Employee SDG Knowledge and Employee Sustainable Behavior, independent sample t test was calculated as shown in Table 4. There were significant differences $df= 269, p= .001$ in the scores with the mean score for Manufacturing sector employees ($M= 29.82, SD =6.51759$) was higher than service sector employees ($M=27.06, SD= 6.97450$). Thus, the results of the test supported the alternate hypothesis that there is a significant difference in Employee SDG Knowledge between employees in manufacturing sector and service sector.

With respect to Employee Sustainable Behavior too, statistically significant differences were observed. There were significant differences $df= 269, p= .006$ in the scores with the mean score for Manufacturing sector employees ($M=64.89, SD =14.32662$) was higher than service sector employees ($M=60.05, SD= 14.56896$). Thus, the results of the test supported the alternate hypothesis that there is a significant difference in Employee

Sustainable Behavior between employees in manufacturing sector and service sector. However, no significant differences were seen in Employee SDG Knowledge and Employee Sustainable Behavior between genders.

Table 4 - Equality of Variances & Independent Samples t-test

Variable	Levene's Test for Equality of Variances		Independent samples t test		
	F	P Value	t	df	p-value
Sector wise difference					
Employee SDG Knowledge	8.252	.004	3.370	269	.001
Employee Sustainable Behavior	2.156	.143	2.759	269	.006
Gender wise Difference					
Employee SDG Knowledge	2.475	.117	-.284	269	.776
Employee Sustainable Behavior	1.935	.165	-.283	269	.777

4.4 Association between Employee SDG Knowledge and Employee Sustainability Behavior

The study also intended to examine the association between Employee SDG Knowledge and Employee Sustainability Behavior for the purpose of which correlation coefficient was calculated. Pearson coefficient of Employee SDG Knowledge and Employee Sustainable Behavior was found to be very highly positive and statistically significant ($r=.909$, $p<0.05$) thereby supports alternate hypothesis that an increase in Employee SDG Knowledge would lead to an increase in Employee Sustainable Behavior as per Table 5.

Table 5 - Correlation Analysis

	Employee SDG Knowledge	Employee Sustainable Behavior
Employee SDG Knowledge	1	.909
Employee Sustainable Behavior	.909	1

**, Correlation is significant at the 0.05level (2-tailed)

5 DISCUSSIONS

This study intends to examine the SDG Knowledge and Sustainable Behavior of the employees across sectors. Results of the analysis indicate that the employees of both manufacturing as well as service sector are aware of SDG topics as also indicated by the average scores.

Despite decent average SDG Knowledge scores, manufacturing sector employees reported higher scores for Sustainable Development Goals knowledge as compared to as compared to service sector employees.

Employees from both the sectors also exhibited certain level of sustainable behavior. The mean scores from both the sector crossed mark of 60 on a scale of 82. However, manufacturing sector employees have demonstrated more sustainable behavior as compared to service sector employees. This difference is explicitly shown in table 4. The possible reason for the same could be lower level of sustainability training been provided in the service sector organizations. This was established during the analysis when only 35% of the respondents working in service sector

agreed that they had been give sustainability training in their organizations as against 52.98% of the respondents working in the manufacturing sector.

This paper also examined the impact of gender on Employee SDG Knowledge and Employee Sustainable Behavior. The results suggests that there is no significant difference between gender and Employee SDG Knowledge and Employee Sustainable Behavior. However, the age-old debate has been going on the impact of gender on SDG knowledge and sustainable behavior.

The close relationship between Employee SDG Knowledge and Employee sustainable behavior is confirmed by the findings of the study. The analysis states that an increase in employee training for SDGs' will lead to an increase in employee sustainable behavior which is in line with existing researches.

6 IMPLICATIONS OF THE STUDY

The study establishes the fact that more SDG know how the employee possess, the more sustainable behavior they exhibit. This clearly indicates that if the organizations want their employees to behave sustainably, they need to secure a 'buy in' for sustainability from their inner core by raising their awareness levels about the same. This requires the organizations to plan their communication with their employees meticulously throughout the employee life cycle around sustainability.

Organization's sustainability focus must be reflected in the recruitment advertisements and job descriptions posted on the career page so as to create strong initial impression of organization as a sustainable employer brand.

Induction training should have the provision of sensitizing employees on Sustainable Development Goals, their significance and organization's commitment towards the same. Organization wide corporate sustainability training must be undertaken to provide factual knowledge to the employees to make prudent decisions as well as to cultivate behavioral change. To bring in greater employee engagement, component of gamification can be introduced in sustainability training like sustainability quiz, poster competitions etc. Employees must be encouraged to take up MOOC courses related to Sustainable development. Furthermore, employee sustainable behaviors can be linked to their performance appraisals since behaviors which are rewarded would be the behaviors that would be exhibited. Social media pages of organizations can be extensively utilized to communicate sustainability focus of the organization.

CONCLUSIONS

This study has established a strong relationship between knowledge of Sustainable Development Goals and Sustainable behavior among the employees working across the sectors. The findings clearly throw light on the role, employee training can play in eliciting sustainable employee behavior. Manufacturing sector employees display more sustainable behavior since they possess greater know how of the sustainability through the formal training programs and workshops conducted in their organizations. By making corporate sustainability training a must do exercise in service organizations too, the more sustainable behavior can be expected from the service level employees as well. Also, performance management processes can be linked to sustainable behavior among employees in order to encourage them to adopt more sustainable way of living. Organizations need to recognize that the route to sustainable innovations is through sustainable employee behavior which can be achieved by equipping them with proper sustainability know how. Most importantly, time has come for the organizations to undertake sustainability measures in true spirit and action and not only limiting it to short term greenwashing.

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Appendix

Questions that were asked from respondents:

Employee SDG Knowledge

No	Items
1	I know what the Sustainable Development Goals are.
2	I know the countries to which the Sustainable Development Goals are addressed.
3	I know the time horizon for which the Sustainable Development Goals are designed.
4	I know the number of Sustainable Development Goals and could indicate one of their goals.
5	I have received information about the Sustainable Development Goals on Social Networks.
6	I have received information about the Sustainable Development Goals from the traditional media (press, radio and/or television).
7	I have received information about Sustainable Development Goals in formal education.
8	I have received information about the Sustainable Development Goals in formal training (e.g. sustainability training, workshops, seminars, conferences etc.)

Employee Sustainable Behavior

No	Items
1	Where possible, I choose to cycle or walk when I'm going somewhere, instead of travelling by motor vehicle.
2	I never waste water
3	I recycle as much as I can.
4	I pick up rubbish when I see it out in the countryside or in public places
5	I do think about how my actions may damage the natural environment.
6	I always separate food waste before putting out the rubbish when I have the chance.
7	I have changed my personal lifestyle in order to reduce waste (e.g., throwing away less food or not wasting materials).
8	When I use a computer or mobile to chat, to text, to play games and so on, I always treat others as respectfully as I would in real life.
9	I often make lifestyle choices which are not good for my health.
10	I work on committees (e.g., CSR committee etc) in my organisation.
11	I treat everyone with the same respect, even if they have another cultural background than mine.
12	I support an aid organization or environmental group.
13	I show the same respect to men and women, boys and girls.
14	I do things which help poor people.
15	I often purchase second-hand goods over the internet or in a shop.
16	I avoid buying goods from companies with a bad reputation for looking after their employees and the environment.
17	I watch news programs or read newspaper articles to do with the economy.