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## **Gender differences in Sustainability knowledge among university Students**

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### **ABSTRACT**

*As countries are working towards the achievement of sustainable development goals, university education is seen as a key ingredient in preparing our future generations for this challenge. However, past studies have shown that there are disparities in the understanding and behavioural practices of male and female students, suggesting that female students exhibit healthy environment related behaviour than their male counterparts. The present study, aiming at examining this claim, administered questionnaires to 437 students across three Universities in India. Although the data indicates that female students possessed slightly better knowledge about sustainability issues and their attitudes and behavioural practices are marginally better than their male counterparts most of such differences were statistically insignificant.*

**Key Words:** Sustainable Development, Sustainability, Gender Differences.

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## **Introduction**

In the last few decades millions have been pulled out of poverty, thanks to rapid economic growth due to technological advancements. But this advancement has come at a cost putting our future generations at risk of extinction. Due to the continuous exploitation of fossil fuels, deforestation, wastage of water resources, increasing pollution levels and rise in Greenhouse gases in the environment, earth's climate has changed. As per estimates oceans hold 97 per cent of the total water resources on earth, with only 2 per cent comprising of glaciers and the remaining 1 per cent in our lakes and rivers (NOAA). As global warming is pushing temperature upwards, it will raise ocean temperatures resulting in frequent storms and heavy rainfall and floods. Climate change is also damaging the natural habitat as rising temperatures are increasing the incidences of wildfires. Since the main cause of climate change is the increasing amount of greenhouse gases released into the atmosphere by burning of fossil fuels, mainly oil and coal, the world is moving towards renewable energy resources like solar, wind, thermal, tidal energy etc., which are not only clean energy sources but are important for the sustainable development of the world. If the amount of greenhouse gases released into the environment is not decreased, it can have serious implications on our future generations. Rising levels of greenhouse gases can affect our health, food supply and water resources. As the population of the world is estimated to reach 9.6 billion by 2050 (UN 2013), at present 1 in eight people goes to bed hungry each night (Mercy Corps, 2015). Of the 842 million malnourished people in the world, 300 million are children; 553 million are from Asia Pacific Countries, while 227 million are from sub-Saharan Africa. These figures are astonishing, as Africa and Asia alone account for roughly around 95 per cent of the world's agricultural population (World Watch Institute 2011). While providing basic healthcare has been a challenge in these countries, India is doing worse with only 0.7 physicians, for every thousand people (World Bank, 2012). As these problems are not particular to a region or specific country only, it requires all the nations to join hands to confront these issues and to come out with solutions.

In 1987, the World Commission on Environment and Development published 'our common future', commonly known as the Brundtland report, calling out all nations to work together for a sustainable development path by setting goals to be achieved. Sustainable development is defined as "development that meets the needs of the present without compromising the need of future generations to meet their own needs" (Brundtland Commission – see World Commission on Environment and Development, 1987). From January, 2016 Sustainable development goals came into force and all the nations are expected to achieve their targets by 2030 (UNGA, 2015). Many actions need to be taken at different levels; universities have a major role to play in this regard. In Agenda 21, Nine of the forty chapters have focused on universities and their role in sustainability (UNSD, 1992) as higher educational institutions have the potential of preparing future generations to handle the intricacies of sustainable development (UNESCO, n.d.). By incorporating sustainability aspects into higher education, the students can be made aware of the impact their actions have on the environment and the interrelationship between the societal, economic and environmental aspects of sustainability (Moore, 2005). However, as the impact of education is positively associated with students developing healthy behavioural practices, there are still differences between male and female students. Connell et al., (1998) found that girl students are environmentally more conscious than their male counterparts and have a stronger feeling and verbal commitment to the environment (Chawla, 1988). Similarly, Mostafa (2007) contends that women are more concerned about environmental issues. As per Socialization

theory women tend to be more independent, nurturing, cooperative and having a stronger ethic of care for other, including the environment in comparison to men (Zelezny and Bailey, 2006). Therefore, we will try to examine whether there are any differences in the knowledge, attitudes and behavioural practices of male and female students particularly in the Indian context.

### **Objectives of the study**

The purpose of this study was to understand the gender differences in knowledge, attitude and behaviour towards sustainability issues in the select institutions of higher learning in India. The implicit idea behind this study was to know whether any differences exist between male and female students so that proper suggestions can be made to the concerned authorities.

### **Rationale of the study**

From the literature review, it is clear that sustainability research is at its peak and the issues and challenges in its implementation have been widely studied across countries (Azapagic, Perdan, & Shallcross, 2005; Kagawa, 2007; Tuncer, 2008; Fisher & McAdams, 2015) but no study on students' awareness about sustainability issues between male and female students could be found, particularly in India. This study will try to uncover whether any such differences exist between the two genders across various campuses in India.

### **Methodology**

The study was undertaken at three universities of India namely, Jamia Millia Islamia (JMI; a central University), University of Kashmir (UoK; a state funded university) and Sharda University (a private institution). A questionnaire was administered to assess the differences in awareness and attitudes of male and female students with respect to Sustainability issues, and their current day-to-day behavioural practices. We received a total of 437 completed questionnaires from the three institutions which comprises of 92 male and 52 female students from UOK; 92 male and 45 female students from JMI and 108 male and 48 female students from Sharda University. Only freshmen were selected for the survey as a course on environmental studies is taught in the second year of graduation, which might influence the responses of the students. The items selected for this study broadly cover the triple-bottom layer of sustainable development concept, covering environmental, social and economic issues of sustainability. The items were selected based on commonalities in various instruments like Marcell, Agyeman, & Rappaport, 2004; Kagawa, 2007; Michalos et al., 2011. Knowledge dimension encompassing 12 items, used a 5-point likert scale with anchor points of Strongly Disagree (1)-Strongly Agree (5). Attitudes, on the other hand, used 9 item scale with 5 point likert scale as well with the same anchor points as above. The Behavioural dimension, having 12 items, asked students to rate their current behavioural practices on a 5 point scale with anchor points Never (1) to Always (5). On all the three dimensions, some items were reverse worded to due to reliability concerns.

### **Survey Results**

First portion of the questionnaire assessed the knowledge of students with respect to sustainability concepts. While examining the differences between the two genders (table 1), overall the female students scored higher than their male counterparts. When comparing the three campuses, both male and female students scored higher than the other two campuses. While female students from UoK and JMI slightly outperformed their male counterparts on the first question "sustainable development requires respect for human rights", both male and female students from Sharda scored poorer on this item. Similarly, on item 3rd, "Improving people's

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opportunities for long and healthy lives contributes to SD”, Sharda students of both genders scored poorer than the other two campuses with only 33 per cent of female students as compared to 74 per cent of male students agreeing or strongly agreeing. On item 4, “The greenhouse effect is caused by an ozone hole in the earth’s atmosphere”, female students from UOK scored better than male and female students of other universities. As students overall showed a poor understanding of item 7 “Economic development is necessary for sustainable development” and item 10 “SD is dependent on gender equality”, more female students than males agreed or strongly agreed to these items. As female students outperformed than their male counterparts, the overall mean scores for both male and female students are lower. This poor score is a result of their shallow knowledge about the sustainable development concept particularly on its economic and social aspects.

Second portion of the questionnaire measured the attitudes of students and assessed differences between male and female students (see table.2). While comparing the three campuses, there were differences between male and female students on many items. Student of both gender from JMI scored lower on the item “Manufacturers should discourage the use of disposables” while students from UOK scored poorer on “It is alright to use as much water as we want, as long as it is available” and “We don’t need stricter laws and regulations to protect the environment”. As could be inferred from the higher mean scores obtained by the UOK students of both genders, they possess unhealthy environmental attitudes. Students of both gender scored lower on item “It is possible to protect the environment and create jobs even when the economy is doing poorly” while students from UoK scored lower on “Use of fuel-efficient vehicles should be encouraged by governments”. Judging from the mean scores it could also be inferred that female students possessed slightly better attitudes than their male counterparts with regards sustainability issues, although the differences are on most of the items are statistically insignificant.

The third portion of the questionnaire was designed to measure the current behavioural practices of male and female students. On the first item “I make lifestyle choices that are good for my health” students of both gender scored poorer with 76 percent of males in comparison to about 63 per cent females disagreeing or strongly disagreeing with the statement. On item “I pick up litter when I see it in a park or a natural area” students from Sharda scored poorer with more females (about 69 per cent) disagreeing or strongly disagreeing with the statement. Most of the students of both genders from the three universities strongly disagreed or disagreed that they volunteered to work with local charities or environmental groups. Male students from UoK and JMI scored poorer on water wastage with about 65 per cent and 55 per cent from UoK and JMI strongly disagreeing or disagreeing with the fourth statement. However, more students of both genders (more than two thirds) from JMI scored higher on items “I choose to walk or bike to places instead of using a motor vehicle”, “I always switch the light off when I don’t need it”, “I buy Energy Efficient products even if they cost more”. However they scored poorer on item “I treat people respectfully, except those who have racial backgrounds different from my own”. Similarly, students from the three campuses scored low on item “I grow my own food”. While students from Uok and Sharda scored poorer than their counterparts at JMI on item “I print on both sides of the paper”, more male students (58 per cent from UoK and 56 per cent from Sharda) strongly disagreed or disagreed with this statement. Similarly, students of both gender scored poorer on items “Use a reusable water bottle”, and “Use reusable cloth bags when shopping” with more female students (about 61, 64 and 85 per cent from UoK, JMI and Sharda) strongly disagreeing or disagreeing with these statements.

Table 1:- Gender based mean scores of students' knowledge across campuses.

Values in the same row and sub table not sharing the same subscript are significantly different at  $p < .05$  in the two-sided test of equality for column

Statements	Mean of UoK		Mean of JMI		Mean of Sharda	
	Male	Female	Male	Female	Male	Female
† Negatively worded questions						
Sustainable Development (SD) requires respect for human rights	4.16 <sub>a</sub>	4.15 <sub>a</sub>	3.42 <sub>a</sub>	3.93 <sub>b</sub>	2.58 <sub>a</sub>	2.50 <sub>a</sub>
SD requires shifting to the use of renewable resources as much as possible	4.15 <sub>a</sub>	3.96 <sub>a</sub>	3.58 <sub>a</sub>	4.07 <sub>b</sub>	3.98 <sub>a</sub>	3.90 <sub>a</sub>
Improving people's opportunities for long and healthy lives contributes to SD	3.85 <sub>a</sub>	3.67 <sub>a</sub>	3.09 <sub>a</sub>	4.02 <sub>b</sub>	2.98 <sub>a</sub>	2.90 <sub>a</sub>
The greenhouse effect is caused by an ozone hole in the earth's atmosphere †	2.91 <sub>a</sub>	2.73 <sub>a</sub>	3.51 <sub>a</sub>	3.42 <sub>a</sub>	3.81 <sub>a</sub>	3.88 <sub>a</sub>
SD requires individuals to reduce all kinds of waste	4.13 <sub>a</sub>	3.94 <sub>a</sub>	3.49 <sub>a</sub>	3.44 <sub>a</sub>	3.87 <sub>a</sub>	3.69 <sub>a</sub>
SD requires access to good quality education for everyone	4.00 <sub>a</sub>	4.12 <sub>a</sub>	3.29 <sub>a</sub>	3.33 <sub>a</sub>	3.30 <sub>a</sub>	3.12 <sub>a</sub>
Economic development is necessary for sustainable development	3.59 <sub>a</sub>	3.81 <sub>a</sub>	2.68 <sub>a</sub>	2.71 <sub>a</sub>	3.23 <sub>a</sub>	2.88 <sub>a</sub>
Cell phone production and usage does not consume a lot of resources †	2.48 <sub>a</sub>	2.56 <sub>a</sub>	2.36 <sub>a</sub>	2.84 <sub>b</sub>	2.09 <sub>a</sub>	2.35 <sub>a</sub>
SD allows the environment to be radically altered in order to create/maintain jobs †	3.01 <sub>a</sub>	2.62 <sub>b</sub>	2.05 <sub>a</sub>	2.62 <sub>b</sub>	3.16 <sub>a</sub>	3.19 <sub>a</sub>
SD is dependent on gender equality	2.16 <sub>a</sub>	2.77 <sub>b</sub>	3.33 <sub>a</sub>	3.80 <sub>b</sub>	2.42 <sub>a</sub>	2.23 <sub>a</sub>
SD requires people to learn new things throughout their lives	3.38 <sub>a</sub>	3.58 <sub>a</sub>	2.77 <sub>a</sub>	2.49 <sub>a</sub>	3.53 <sub>a</sub>	3.44 <sub>a</sub>
The elimination of poverty is necessary for SD.	3.65 <sub>a</sub>	3.42 <sub>a</sub>	3.35 <sub>a</sub>	3.67 <sub>a</sub>	3.83 <sub>a</sub>	3.81 <sub>a</sub>

means. Cells with no subscript are not included in the test. Tests assume equal variances

Table 2:- Gender based mean scores of students’ Sustainability Attitudes across campuses.

Statements	Mean of UoK		Mean of JMI		Mean of Sharda	
	Male	Female	Male	Female	Male	Female
† Negatively worded questions						
Governments should adopt SD as a national priority	3.43 <sub>a</sub>	3.73 <sub>a</sub>	3.39 <sub>a</sub>	3.69 <sub>a</sub>	4.07 <sub>a</sub>	4.02 <sub>a</sub>
It is important to find ways to reduce poverty	3.07 <sub>a</sub>	3.17 <sub>a</sub>	3.22 <sub>a</sub>	3.16 <sub>a</sub>	4.25 <sub>a</sub>	4.08 <sub>a</sub>
Manufacturers should discourage the use of disposables	3.09 <sub>a</sub>	3.25 <sub>a</sub>	2.65 <sub>a</sub>	2.53 <sub>a</sub>	3.96 <sub>a</sub>	3.85 <sub>a</sub>
It is alright to use as much water as we want, as long as it is available †	2.91 <sub>a</sub>	3.40 <sub>b</sub>	2.13 <sub>a</sub>	2.31 <sub>a</sub>	2.18 <sub>a</sub>	2.23 <sub>a</sub>
We don’t need stricter laws and regulations to protect the environment †	3.22 <sub>a</sub>	3.06 <sub>a</sub>	2.51 <sub>a</sub>	3.20 <sub>b</sub>	2.14 <sub>a</sub>	2.06 <sub>a</sub>
People who pollute our land, air or water should pay for damage done to communities and the environment	3.93 <sub>a</sub>	4.08 <sub>a</sub>	3.30 <sub>a</sub>	3.87 <sub>b</sub>	4.30 <sub>a</sub>	4.27 <sub>a</sub>
Males and females should have equal access to all kinds of education and employment	3.64 <sub>a</sub>	3.29 <sub>a</sub>	3.45 <sub>a</sub>	3.29 <sub>a</sub>	3.98 <sub>a</sub>	4.00 <sub>a</sub>
It is possible to protect the environment and create jobs even when the economy is doing poorly	3.78 <sub>a</sub>	3.67 <sub>a</sub>	2.74 <sub>a</sub>	3.11 <sub>a</sub>	3.06 <sub>a</sub>	3.27 <sub>a</sub>
Use of fuel-efficient vehicles should be encouraged by governments	2.20 <sub>a</sub>	1.75 <sub>b</sub>	3.18 <sub>a</sub>	3.60 <sub>a</sub>	3.55 <sub>a</sub>	3.60 <sub>a</sub>

Values in the same row and sub table not sharing the same subscript are significantly different at  $p < .05$  in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances

Table 3:- Gender based mean scores of students’ behavioural practices across campuses.

Statements	Mean of UoK		Mean of JMI		Mean of Sharda	
	Male	Female	Male	Female	Male	Female
† Negatively worded questions						
I make lifestyle choices that are good for my health.	2.03 <sub>a</sub>	2.31 <sub>a</sub>	2.98 <sub>a</sub>	3.16 <sub>a</sub>	2.62 <sub>a</sub>	2.79 <sub>a</sub>
I pick up litter when I see it in a park or a natural area.	2.57 <sub>a</sub>	2.65 <sub>a</sub>	2.61 <sub>a</sub>	2.47 <sub>a</sub>	2.24 <sub>a</sub>	2.08 <sub>a</sub>
I volunteer to work with local charities or environmental groups.	2.36 <sub>a</sub>	2.77 <sub>b</sub>	2.00 <sub>a</sub>	2.27 <sub>a</sub>	1.97 <sub>a</sub>	2.00 <sub>a</sub>
I never waste water- take short showers	2.16 <sub>a</sub>	2.92 <sub>b</sub>	2.57 <sub>a</sub>	3.33 <sub>b</sub>	3.13 <sub>a</sub>	3.13 <sub>a</sub>
I choose to walk or bike to places instead of using a motor vehicle	2.35 <sub>a</sub>	2.35 <sub>a</sub>	3.59 <sub>a</sub>	4.07 <sub>b</sub>	2.44 <sub>a</sub>	2.31 <sub>a</sub>
I always switch the light off when I don’t need it	2.66 <sub>a</sub>	3.33 <sub>b</sub>	3.66 <sub>a</sub>	3.64 <sub>a</sub>	3.91 <sub>a</sub>	3.83 <sub>a</sub>
I buy Energy Efficient products even if they cost more	2.64 <sub>a</sub>	2.63 <sub>a</sub>	3.73 <sub>a</sub>	3.89 <sub>a</sub>	3.42 <sub>a</sub>	3.29 <sub>a</sub>
I treat people respectfully, except those who have racial backgrounds different from my own †	2.61 <sub>a</sub>	2.60 <sub>a</sub>	3.57 <sub>a</sub>	3.42 <sub>a</sub>	2.99 <sub>a</sub>	2.60 <sub>a</sub>
I grow my own food	1.85 <sub>a</sub>	1.83 <sub>a</sub>	1.79 <sub>a</sub>	2.44 <sub>b</sub>	1.71 <sub>a</sub>	1.98 <sub>a</sub>
I print on both sides of the paper	2.50 <sub>a</sub>	2.96 <sub>b</sub>	3.47 <sub>a</sub>	3.22 <sub>a</sub>	2.28 <sub>a</sub>	2.33 <sub>a</sub>
Use a reusable water bottle	2.95 <sub>a</sub>	3.13 <sub>a</sub>	2.71 <sub>a</sub>	3.47 <sub>b</sub>	2.54 <sub>a</sub>	2.54 <sub>a</sub>
Use reusable cloth bags when shopping	2.35 <sub>a</sub>	2.56 <sub>a</sub>	2.17 <sub>a</sub>	2.24 <sub>a</sub>	1.84 <sub>a</sub>	1.67 <sub>a</sub>

Values in the same row and sub table not sharing the same subscript are significantly different at  $p < .05$  in the two-sided test of equality for column means. Cells with no subscript are not included in the test. Tests assume equal variances



## **Conclusion**

A lot of Research on sustainable development concepts is going on around the world but this concept has not received much attention in India. While gender differences in knowledge, attitudes and behaviours are well documented in the literature, this study tries to understand the gender differences in knowledge pertaining to the sustainable development concept as well as the attitudes and behavioural practices of students across India. The study concludes that female students are more aware than their male counterparts and have slightly favourable attitudes and marginally better behavioural practices than male students. However the overall knowledge of students from both genders is shallow and based on their self-assessment they have poor behavioural practices particular in social aspects of sustainable development concept.

As any published piece of research work has its limitations, this study is no exception. This study has taken into consideration only three intuitions of higher learning due to various resource and time constraints, it is difficult to generalize the findings relating to all male and female students of India. However, the respondents in this sample being natives of various states are mostly representative of the characteristics of the student populace of India. Nevertheless more thorough more studies need to be conducted to confirm the findings of this study and to understand the causes of such differences.

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