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Green Skills and Eco-Friendly Sustainable Practices Among Secondary School Students: An Exploratory Analysis

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Abstract:
Rapid developmental reforms have significantly contributed to reducing poverty, hunger, and inequality, thereby improving living standards and quality of life. However, these advancements have also increased pressure on the natural environment, leading to concerns such as global warming, pollution, and depletion of resources. These challenges threaten both present and future generations, emphasizing the need for immediate action. In response, environmental education has been integrated across educational levels to promote responsible citizenship. Sustainable development can be achieved only through a balance between economic growth and environmental preservation. Young learners, particularly at the secondary level, play a crucial role in influencing long-term environmental outcomes. Despite increased awareness, the actual practice of environmentally responsible behaviour among students remains limited, highlighting the need for focused educational interventions. In this context, the development of environmentally sustainable green skills encompassing knowledge, attitudes, and behavioural competencies has emerged as a crucial step towards fostering environmental responsibility. Secondary education, as a formative phase, plays a significant role in shaping these competencies. The present study examines the existing level of green skills practices among secondary school students using a structured questionnaire covering key domains of sustainability. The findings reveal score ranges between 1.32 and 2.97, indicating an unsatisfactory level of practice. The results underscore the need for urgent and effective interventions, particularly through curriculum reforms and pedagogical strategies at the school level. Such initiatives may gain greater significance in the context of the transformative changes envisioned under the implementation of the National Education Policy 2020.

Key Words: Green Skills, Environmentally Sustainable Behaviour, Secondary School Students, Sustainable Future.

CONCEPTUALISATION OF THE PROBLEM

Despite wealth in natural and human resources, India faces numerous issues related to the economy, employment opportunities, education, environment, and many other factors. Interaction between humans and the environment is a universal truth such as human dependency on natural resources for their living, complete dependency of humans on forests, grasslands, rivers, seashores, water, fuel, wood, fodder, etc. for industrial and infrastructure development, resulting in over-exploitation. Resulting in severe environmental consequences such as environmental pollution such as air, water, soil and noise, degradation of natural resources and many more. Increasing environmental issues such as raising global temperature, extreme drought, changing weather and raise in the surface of ocean reported globally in recent years. Anthropogenic activities for various developmental processes have been a major factor of environmental degradation. The degradation of the environment and its resources has made the entire world to make the necessary changes in the current practices (Runhaar et, al., 2019). However, environmental concern is nothing new; policies at national and international levels contribute special

emphasis on minimizing environmental degradation. The Indian constitution too is having a special provision for the protection and improvement of environmental quality and safeguarding of the flora and fauna as mentioned in article 48-A. The prime concern for putting environmental education into various levels is to create awareness of environmental issues and challenges at the same time to create knowledge, attitude and skills among the individual to deal with the problems in a sustainable manner.

The current education system is facing several challenges in preparing competent students who are not capable to live in harmony with nature. It is not about knowledge but also about how to utilize the knowledge for creating new ideas, which can be used for balancing the relationship between man and nature, to have a cordial relationship between humans and nature. As education is considered as one of the best means of channelizing knowledge, skill and attitude for present and future needs in maintaining sustainable life (Pavlova & Chen, 2019).

Green skills referred to the ability of human value and attitude toward the sustainable utility of natural resources. Green skill is the awareness about the environment, energy efficiency, water conservation, waste reduction and waste management that must be evolved in an individual. Study by Pavlova, (2011) says green skills are awareness on the environment, attitude and willingness towards sustainability on several challenges and issues on achieving sustainable development. Green skills altogether are having 20 elements of soft green skills and total of 13 elements of hard green skills. Green skills related to green practices such as use of green technologies, which contribute to green economy. Green skills ensure the widespread use of green technology and balancing the lifestyle in terms of emotional, spiritual, physical and intellectual wellbeing. The green technology refers to handling eco-friendly or environmentally friendly technological gadgets to preserve the status of nature and natural resources. It is also referring that person with green skills must be able to engage in eco- friendly activities such as practice of 3R i.e., reuse, recycle and reduce. Individual must be able to differentiate the waste materials based on their properties for recycling and disposal that will make an individual sensitive toward environment. Minimum or optimum use of resources, reduce emission of toxic gasses by using eco-friendly products, which have less or no effect on environment (Swinburne University of Technology, 2014). Some of the practices were in the hospitality and food industries, the workers carry out the different sustainable behaviour by promoting eco-tourism, use of renewable resource and use of cycle instead of vehicles are some of eco-friendly practice. Green skills also dealing with the energy saving practices such a switch off the electronic devices and avoiding the insensible behaviour of leaving the power plug attached to the socket. Innovative practices by using computers, LCD and projectors and implementing e-learnings in the classroom and saving the electricity while using such devices can also come under green practices. Such types of practices make individual more responsible towards natural conservation. Generic Green Skills can be enhanced through enhancing teaching learning practices. Findings from National Environmental Educational and Training (NEETF) and Asia Foundation, 2020 revealed that the majority of the people are not aware of causes of pollution and how to react with it, in such situation green skills can be useful to deal with such situation. Likewise, study found 97% of the respondents has no or less concern about the climate change. Study highlighted activities which mitigates environmental degradation or damages and energy saving can be considered as green practices.(Kamis et al., 2018)

RATIONALE OF THE STUDY

Lack of environmental behaviour among the young generation in managing environmental consequences, lack of awareness, attitude and skills may cause or contribute to serious environmental impact. A country development always lies on its human capital that must be able to contribute sustainable future by green skills practices. For the production of competent human, it is important to consider the intellectual, spiritual and physical dimensions in the individual. (Ibrahim et, al.,2020). At the secondary stage the students start taking interest towards the professional courses so it is very important to make them more competent so that they can contribute for the green economy through green practice from the initial level.

It is important to enhance the employability skills, which can make them skilled to perform any job in the market by balancing environmental consequences. For the present job, market employ must have additional skills to balance the environment along with the economic development. Apart from technical skills, it is very important to focus on the non-technical skills of an individual. (Sern et, al., 2018). Non-technical or employability skills named as soft skills or emotional intelligence (Handayani & Mustapha, 2020), workability skills (Hartmann et, al., 2019). International Centre for Technical and Vocational Education Training has developed the content for green technical vocational education and training (TVET). The major components of the content were problem solving skills, education for sustainable development and entrepreneurship education. It assures the awareness about the environment by integrating sustainability in the curriculum. Knowledge on technical and other non-technical skills and attitude are the important element of green skills, which is the need to prepare human resources. In this context as per the changing conceptualization of the green practices and environmentalism, what kind of behaviour are invariably visible and to be promoted among the secondary learners is a crucial question to an adverse. Hence an attempt made to assess the green skills practice among the learners and explains the significance and its implications

OBJECTIVES

To analyse the existing green skills practices among the secondary school students.
To apprise the importance and significance of enhancing environmentalism among younger generation for sustainable future.

METHOD

Sample

Population of the study are secondary school students from Kerala. Total of 300 secondary school students selected randomly with the age group of 12-18 years where male and female were equal in numbers.

Tool Used

Self - developed questionnaire on green skills practices were used for data gathering from the secondary school students of Kerala. Questionnaire consisted with 30 items on 3- point Likert scale ranging from ‘1’ disagree, ‘2’ sometimes/uncertain and ‘3’ agree. All the items under the questionnaire have been grouped under five different elements as indicator of green skills such as Water/ Soil Conservation, Waste/Pollution Management, Technological Practices, Energy Conservation and Procurement/Financial Practices.

Reliability And Validity

Total of 35 items has been included in the questionnaire. was consisting of 35 items. To test the reliability of the scale a pilot study had done on randomly selected students from secondary schools and the responses were recorded on the 3-point scale. In order to test the reliability Crouchback Alfa were conducted on all the 35 items in the questionnaire as a whole. The total row score of the instrument was found 0.69. For the internal consistency few items have been deleted and the score were near to 0.79. Lastly total 30 items were finalized after the expert validation from the field of environmentalist, psychologist, sociologist, and educationalist. The scale was found as high face validity as it has been approved by the experts. It also holds content validity as the items were discriminated based on low and high score were retained in the scale. As per the validity and liability studies, the tool has considered as valid and reliable for analysing the green skill practices among the secondary school students. Data collection was done with the help of questionnaire by following survey method.

RESULTS

The study intended to analyse the existing practices of green skills among the secondary school students and reflect its significance for enhancing environmentalism among younger generation for sustainable future.

The results of the study reveal a wide variation in students' green skills across different domains, with overall mean scores ranging from 1.32 to 2.97, indicating heterogeneous levels of performance across knowledge, attitude, and skill components.

Table 1. Green Skills Indicators and its Distribution for Water/Soil Conservation

Element	Indicator	Mean	SD
Water/soil Consecration	Knowledge on water conservation	2.97	0.14
	Knowledge on soil conservation	2.96	0.22
	Attitude toward water conservation	1.85	0.77
	Attitude towards soil conservation	2.36	0.58
	Skill towards water conservation	1.32	0.49
	Skill towards soil conservation	1.37	0.48

In the domain of water and soil conservation, the mean scores range from 1.32 to 2.97. The knowledge component shows consistently high scores, ranging between 2.96 and 2.97, reflecting relatively uniform understanding among students. In contrast, the skills component and attitude component show lower and more dispersed values, ranging from 1.32 to 2.36, indicating variability in their responses across behavioural and dispositional aspects of water and soil conservation practices.

Table 2. Green Skills Indicators and its Distribution for Waste/ Pollution Management

Element	Indicator	Mean	SD
Waste/Pollution Management	Knowledge on waste management	2.72	0.51
	Knowledge on pollution	2.79	0.45
	Attitude toward waste management	2.64	0.50
	Attitude towards pollution	2	0.79
	Skill towards waste management	1.83	0.67
	Skill towards pollution	1.20	0.43

With respect to waste management, the overall mean scores range from 1.83 to 2.79. The knowledge scores fall between 2.72 and 2.79, while the attitude scores range from 2.00 to 2.64, showing moderate variation. However, the skills component registers comparatively lower values, ranging from 1.20 to 1.83, indicating a wider spread and lower level of consistency in practical waste management-related behaviours among respondents.

Table 3. Green Skills Indicators and its Distribution for Technological Practices

Element	Indicator	Mean	SD
Technological Practices	Knowledge on technology	2.79	0.40
	Knowledge on green technological devices	2.62	0.50
	Attitude toward green technology	2.41	0.57
	Attitude towards green technology practices	2.67	0.51
	Skill towards green technology	2.48	0.57
	Skill towards innovating green technology	2.39	0.58

In the domain of technological practices, the mean scores range between 2.39 and 2.79, indicating relatively higher and more stable performance compared to other domains. The knowledge component ranges from 2.62 to 2.79, the attitude component from 2.41 to 2.67, and the skills component from 2.39

to 2.48. These values show comparatively narrower variation across the three components within this domain.

Table 4. Green Skills Indicators and its Distribution for Procurement/Fanatical Practices

Element	Indicator	Mean	SD
Procurement/Fanatical Practices	Knowledge on green economy	2.38	0.52
	Knowledge on investment in green economy	2.79	0.45
	Attitude toward investment in greening	1.97	0.72
	Attitude towards sustainable green consumerism	2.26	0.65
	Skill towards practice of green culture	1.89	0.75
	Skill towards investing in environmental conservation	1.88	0.55

The domain of procurement and financial practices exhibits lower overall mean scores, ranging between 1.89 and 1.97. Within this domain, the knowledge component ranges from 2.38 to 2.79, whereas the attitude component ranges from 1.97 to 2.26. The skills component shows the lowest range, between 1.88 and 1.89, indicating minimal variation and comparatively lower performance levels in this area.

Table 5. Green Skills Indicators and its Distribution for Energy Conservation

Element	Indicator	Mean	SD
Energy Conservation	Knowledge on energy conservation	2.78	0.46
	Knowledge on energy consumption	2.60	0.55
	Attitude toward energy conservation	2.10	0.84
	Attitude towards sustainable consumption	2.01	0.84
	Skill towards energy conservation	2.69	0.52
	Skill towards sustainable practice of energy consumption	2.49	0.61

In the domain of energy conservation, the mean scores range from 2.10 to 2.78. The knowledge component ranges between 2.60 and 2.78, while the attitude component ranges from 2.01 to 2.10, showing relatively lower variation. The skills component ranges from 2.49 to 2.69, indicating moderate and fairly consistent performance across respondents.

DISCISSION

Knowledge Skills And Attitude on Water/Soil Conservation

Based on the research findings element of green skills i.e., water/soil conservation scores range between 1.32 to 2.97, which can be interpreted that skills and attitude towards the green practices is not satisfactory and need more efforts. The knowledge is satisfactory as the average score ranges between 2.96 to 2.97 whereas the skill and attitude towards green skills are not satisfactory as the values ranges in between 1.32 to 2.36 which is low. Conservation of soil is important because it contains several microorganisms which is essential for the growth and development of the plants as plant is the produces and the entire living world are depends on the plant ecosystem. Several environmental issues such as soil erosion leads due to loss of plants, heavy use of chemical fertilizers, use of toxic chemicals pesticides and landfills of wastes

into the soil damages the textures of the soil that leads to infertility. Water conservation and optimum use of water are directly linked to environmental sustainability. Optimum uses of water at household, industrial, agricultural and other purposes are highly recommended to reduces the wastage of water. As soil hold several minerals and natural resources, including plants and microorganism in it. It is very important to conserve the soil from pollution by using sustainable practice of agriculture at the same time infrastructure development through green building concepts. All are interlinked to each other by the practice of green skills individual know the different skills to tackle the situation and make the environment much safer.

Knowledge Skills and Attitude on Waste/ Pollution Management

Elements of green skill i.e., waste/pollution management, has the average values, ranges betweens1.83 to 2.79 which shows the wide ranges of diversity in responses. Separately the average scores on skills towards waste/pollution management among the students were 1.833 to 1.20 which seems very low level of waste management, i.e., not satisfactory and need to give emphasis to enhance it. As separation of waste needs to be done at the initial stages where all the different types of waste must be segregated based on the types i.e., biodegradable, non-biodegradable, medical and recyclable etc. Waste/Pollution management is significantly contributing in the reduction of waste and pollution. Waste management is the ability to reuse the materials for any other purposes. Recycle is manufacture new materials from the previous and reduce i.e., optimum consumption of resources are elements of green skills. Soil pollution, air pollution, water pollution and noise pollution have negative impact on the environment.

Knowledge Skills and Attitude on Technological Practices

Similarly, among the technological practices the mean scores range between 2.39 to 2.79, which indicates satisfactory level of technological practice among the respondents. As the COVID-19 made a complete shift in teaching learning process from offline to online which has a significant level change in the technological practices among the students. High use of internet, e-resources and tools for the teaching learning might be the reasons in significant change in the knowledge attitude and skills among the students. Technological knowledge is essential for the present context as the world is going towards digitalization. Education to industrialization all the areas has been influenced by the digital world. Digitalization not only creates platform for the individual to flourish but it creates lot of challenges such as lack of knowledge about technological appliances, appropriate use and many more. Digitalization is considered as eco-friendly practice as it reduces the use of paper and many more.

Knowledge Skills and Attitude on Procurement/ Financial Practices.

Investment in the eco-friendly materials is highly correlated with the green skill practices. The procurement/financial element of green skills indictor mean ranges between 1.88 to 2.79 among which the skills related to financial or investment mean scores seems low i.e., 1.88 to 1.89 which is not satisfactory and need improvement whereas knowledge and attitude on green skills element were satisfactory. Fanatical and procurement practices is also essential element of green skill as it is directly contributing to the economy. To control the expenditure in order to balance the resources at the same time become responsible towards environmental conservation by purchasing the eco-friendly materials.

Knowledge Skills and Attitude on Energy Conservation

Energy saving is also an element if green skills. Element of green skills i.e., energy conservation has also satisfactory mean ranges between 2.01 to 2.78. Alternative sources such as solar or thermal energy is considered as the less or no harmful to the environment. The world depends on the fossil fuel, petroleum, natural gasses, and coal which is a non-renewable source of energy. According to the World Bank data 86% of worlds consumption are from fossil fuel and only 15% of consumption from alternative source of energy during the year of 2015. It is very important to switch from conventional sources to alternative sources of energy so the impact on environment can be reduced.

EDUCATIONAL IMPLICATION

The integration of green skills serves as a critical pathway for promoting sustainable practices and developing practical solutions that enhance students' knowledge, awareness, attitudes, and competencies

related to environmental responsibility. Through the systematic incorporation of green skills, students are provided with diverse opportunities to engage with issues of environmental sustainability. Such exposure among the younger generation is likely to generate a positive impact not only on the environment but also on broader social and economic dimensions.

Introducing green skills within classroom practices enables students to relate theoretical concepts to real life environmental challenges. This experiential engagement facilitates meaningful transformations in their attitudes and behaviours, encouraging them to recognize environmental concerns, critically rethink existing practices, and reconstruct environmental values in a more responsible and sustainable manner. As students internalize these values, they gradually develop a sense of environmental stewardship and accountability.

Furthermore, the consistent practice of green skills contributes to the reduction of negative environmental impacts while simultaneously fostering sustainable habits from an early stage of education. The promotion of such practices within the school system also plays a significant role in supporting the transition towards a green economy. By cultivating environmentally conscious knowledge, skills, and attitudes among students, educational institutions can contribute both directly and indirectly to the development of sustainable economic practices and environmentally responsible societies.

CONCLUSION

Cultivating green skills among secondary school students is essential for ensuring a sustainable future. Although many students possess a basic understanding of environmental issues, the translation of this knowledge into practical competencies and responsible attitudes remains a significant challenge that requires greater educational attention. In this context, schools play a pivotal role in facilitating the development of green skills by integrating experiential and practice-oriented learning opportunities within the curriculum. Such initiatives can strengthen students' environmental awareness while encouraging them to adopt responsible and sustainable actions in their daily lives.

Promoting green skills among young learners represents a strategic investment in the future, as it equips them with the competencies required to address emerging environmental challenges. The evolving educational landscape, particularly with the implementation of policy initiatives such as the National Education Policy 2020, provides a valuable opportunity to embed sustainability-oriented learning within mainstream education. This transformation can support the alignment of economic development with environmental conservation by nurturing environmentally responsible citizens from an early stage.

Prioritizing the development of green skills within school education is therefore of paramount importance. By bridging the gap between environmental knowledge and meaningful action, education can empower students to contribute actively to environmental protection and sustainable development. Such efforts will not only foster ecological responsibility among the younger generation but also help create a more resilient, balanced, and sustainable future for society and the planet.

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