

EFFECT OF ENVIRONMENTAL EDUCATION ON ENVIRONMENTAL ATTITUDE TOWARDS ENERGY CONSERVATION AND SOLID WASTE MANAGEMENT AMONG SECONDARY SCHOOL STUDENTS

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ABSTRACT

Environmental education (EE) is a critical catalyst in shaping sustainable attitudes among secondary school students, fostering knowledge, skills, and responsibility necessary to address urgent issues like energy conservation and solid waste management. Rapid urbanization impacts local ecosystems, equipping students with environmental awareness is essential. This study aims to evaluate how formal and co-curricular environmental education influences the attitudes and practical actions of students toward energy saving and effective waste disposal, aiming to foster a proactive, eco-conscious younger generation. Data were collected from 200 secondary school students (100) male, (100) female) to assess attitudes toward energy conservation and solid waste management using a 5-point Likert scale, analyzed via response frequencies and average values. In conclusion, the findings demonstrate that a significant majority of secondary school students (over 61.5%) possess a favourable attitude toward energy conservation and solid waste management.

Keywords: Environmental Education, Energy Conservation, Solid Waste Management, Attitude

INTRODUCTION

Environmental education transforms awareness into responsible behavior, making it crucial for secondary education, where values are firmly established. Environmental education for school students on recycling and energy reduction is a popular measure to increase environmental awareness, attitudes and behaviours. Energy literacy is a key factor in ensuring the protection of the natural environment. Numerous studies on energy literacy have demonstrated instructional methods to promote the willingness to save energy as a critical research subject.

Specifically, environmental education should inculcate in students sensitivity towards caring for the environment and its resources and understanding of what and why energy crises

occur. At the same time, opportunities should be given to them to deliberate on courses of action and strategies to address the energy crisis in the future.

Energy is the prime mover of economic growth and is vital to sustaining a modern economy and society, and one of the basic requisites for economic development. Energy conservation emerged as one of the major issues in recent years. Conservation and efficient utilization of energy resources play a vital role in narrowing the gap between demand and supply of energy (Jyoti Rani, 2015; Susheela , 2021).

Energy education programs aim to reduce energy consumption to even out daily and seasonal energy demands, save consumers money on utility bills and curb greenhouse gas emissions. These programs promote behaviours that reduce energy consumption in the short term (that is, unplugging appliances when not in use) and in the long term by increasing propensity to acquire energy-efficient capital stock (that is, purchasing Energy Star certified appliances) (Allcott and Rogers, 2014).

The students must understand energy consumption in their daily lives and understand the environmental and social impact of energy production and consumption. In addition to cultivating energy literacy, energy education should further consider and explore solutions to the lack of energy conservation behaviours (Lee et al., 2016; Lee et al., 2017). Children must treat with environmental education in school to encourage their families to engage in pro-environmental behaviours, including energy-saving behaviours (Hiramatsu et al., 2014), recycling (Evans et al., 1996), and decreasing household waste (Grodzinska-Jureczak et al., 2003).

Waste can be defined as materials considered as unwanted goods or seen as materials for which there are no further use (Peavy et al., 1986; Anderson, 1999). Comprehensive solid waste management incorporates a diverse range of activities including reduction, recycling, segregation, modification, treatment and disposal which have varying levels of sophistication (Licy et al., 2013; Zagozewski et al, 2011; Ntona et al., 2015).

Well-organised waste management is an essential part of sustainable development. The saving of resources and energy is everyone's concern. Effective and efficient waste management is essential for sustainable development (Baud et al., 2001; Morrissey and Browne, 2004). Primary and secondary school tuition has been identified as a key factor regarding education in

general and environmental education in particular (Ballantyne et al., 2005; 2009; 2006; 2001; 2011; Gross, 1977; Farmer et al., 2007).

One of the main causes of environmental degradation is improper management in the disposal of solid waste. It is a significant cause of pollution and outbreak of diseases in many parts of the world. There is no permanent solution for environmental problems; we can only reduce and control waste generation through proper awareness and practice. Adequate management of the waste generated is most important in this matter.

Students must have awareness about environmental problems so that they can play their role very effectively in proper waste management (Tartiu, 2011). From this perspective, the government must increase public awareness, especially of young generations, towards proper waste management through education as it is a key to promoting sustainable development (Blanchard, 1995).

Objectives of the Study:

To study the effect of environmental education on environmental attitude towards Energy Conservation and Solid Waste Management among secondary school students.

Method of the Study: Questionnaire.

Sample of the Study: 200

Delimitations of the Study

1. The study is limited to Rural and Urban areas of the Nellore district of AP only.
2. The study is limited to 200 students only.
3. The study is confined to IX class students of Secondary school Students.

Sampling distribution based on Gender of the Study:

The sample consisted of 200 secondary school students (100 male, 100 female). Participants rated their agreement with statements concerning energy conservation and solid waste management issues on a 5-point Likert scale (strongly disagree to strongly agree). Data were analyzed using frequency distributions and mean scores to assess attitudes.

Table 1: Sampling distribution based on Gender of the Study

S.No.	Students	KNR School (U)	ZPP School (R)	Total
1.	Male	50	50	100
2.	Female	50	50	100
Total		100	100	200

Table 2: Showing Scoring Procedure

Nature of statement	Strongly agree	Agree	Uncertain	Disagree	Strongly disagree
Favourable	5	4	3	2	1
Unfavourable	1	2	3	4	5

Table 3: The total number of favourable and unfavourable items of Attitude scale with their serial number in the Attitude scale

S.No.	Dimensions	Serial number of items in a scale		Total number of questions in each dimension
		Favourable	Unfavourable	
1.	Energy Conservation and Solid Waste Management	2,3,4,5,6,7,11	1,8,9,10	7+4=11

Results and Discussion:

The data obtained from EAS (Environmental Attitude Scale) are classified into frequencies and percentages of the level of response of secondary school students for each item of the tool, viz. Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree.

Table 4: Showing the frequencies and percentages of responses of Secondary School Students on each item of EAS.

Item.No	SA	%	A	%	N	%	D	%	SD	%
Energy Conservation and Solid Waste Management										
IV1*	3	1.5	1	0.5	28	14	57	28.5	111	55.5
IV2	153	76.5	23	11.5	11	5.5	6	3	7	3.5
IV3	85	42.5	68	34	37	18.5	6	3	4	2
IV4	133	66.5	56	28	6	3	3	1.5	2	1
IV5	149	74.5	29	14.5	13	6.5	4	2	5	2.5
IV6	121	60.5	36	18	33	16.5	2	1	8	4
IV7	88	44	45	22.5	35	17.5	16	8	16	8
IV8*	21	10.5	23	11.5	47	23.5	60	30	49	24.5
IV9*	30	15	10	5	13	6.5	68	34	79	39.5
IV10*	16	8	41	20.5	11	5.5	56	28	76	38
IV11	69	34.5	54	27	57	28.5	11	5.5	9	4.5

Table 5: Showing the frequencies and percentages of responses of Secondary School Students for positive items of Energy Conservation and Solid Waste Management aspects of EAS.

Item No	Statement of items	Percentage of Responses	
		Favourable	Un-Favorable
	Energy Conservation and Solid Waste Management		
2.	Shop-keeper should stop handing out plastic carry-bags.	176(88)	13(6.5)
3.	There should be more wind mills.	152(76)	30(15)
4.	Conservation of energy should be regarded as the responsibility of everyone	189(94.5)	5(2.5)
5.	The government should ban the use of plastic containers to reduce pollution of our surroundings	178(89)	9(4.5)
6.	One should use energy resources, such as	157(78.5)	10(5)

	solar, which cause the least pollution		
7.	Solid wastes should be made to dispose of only in the landfills (or) pits.	133(66.5)	32(16)
11.	Paperless administrative works are most suitable for reducing paper waste	123(61.5)	20(10)

The above table 5 shows that the responses of secondary school students to each positive item related to dimension Energy Conservation and Solid Waste Management aspect of EAS ranges from 61.5% to 94.5%. About 61.5% to 94.5% of students expressed a favourable attitude towards the environment for each item related to Energy Conservation and Solid Waste Management. Hence, more than 61.5% of students have a favourable attitude towards Energy Conservation and Solid Waste Management aspects of the Environment.

The high percentage of students (94.5%) viewing energy conservation as a collective responsibility aligns with global trends. Research in the Indian Journal of Applied Research noted that nearly 95-97% of students believe there is a "dire need" for awareness in energy conservation. Similarly, a study on Secondary Education emphasizes that education is a "pivotal" driver in shaping these attitudes toward sustainable energy use.

One of the best and most viable alternatives to disposal is provided by recycling, which produces many benefits, including preservation of scarce resources, reduction of waste that has to be land-filled or incinerated, conservation of energy that would be needed to produce new goods from raw materials and a lowering of pollution levels. Pre-knowledge will trigger students' behaviour beliefs and influence their attitude toward having proper waste disposal. From the results obtained, it was found that 66.5% of the respondents indicated that Solid Wastes should be made to dispose of only in the landfills (or) pits. On the other hand, 16% indicated that they disagree that Solid wastes should be made to dispose of only in the dumps (or) pits. This finding showed that students knew what they should do with waste with pre-knowledge on the impact of improper waste disposal. This situation is a good indicator that students could change their attitude towards behaviour to have a good intention and high-quality behaviour on waste management.

Taking personal responsibility for environmental concerns requires individual effort and personal drive. In this section, the researcher sought to determine the level of responsibility and participation, and the results were as shown. From the results obtained, it was found out that in the case of conservation of energy, 94.5% of the respondents agree that conservation of energy should be regarded as the responsibility of everyone; on the other hand, 2.5% of the respondents disagree with the statement, and 78.5% agree and 5% disagree that one should use energy resources, such as solar, which cause the least pollution

Waste recycling and reuse is another efficient way of managing solid waste. In this case, 61.5% of the respondents indicated that Paperless administrative works are most suitable for reducing paper waste; 10% doesn't agree with this.

The solid waste from rural areas is more biodegradable, and urban regions contain more non-biodegradable components like plastics and packaging. Knowledge about alternatives for plastic should be imparted and promoted among the student population. It should not be mere a study; instead, it should become part of their life. In this context, 89% agree and 4.5% disagree that the government should ban plastic containers from reducing pollution of our surroundings, and 88% agree and 6.5% disagree that shopkeepers should stop handing out plastic carry-bags.

Table 6: Showing the frequencies and percentages of responses of Secondary School Students for negative items of Energy Conservation and Solid Waste Management aspects of EAS

Item No	Statement of items	Percentage of Responses	
		Favourable	Un-Favorable
	Energy Conservation and Solid Waste Management		
1*.	More and more hydroelectric power stations should be created to meet the need of people.	4(2)	168(84)
8*.	It is merely a waste of time making decorative with waste materials.	44(22)	109(54.5)

9*.	No need to create awareness on consumption and saving of electricity and fuels	40(20)	147(73.5)
10*.	Waste disposal is the sole responsibility of the local authorities	57(28.5)	132(66)

From the above table 6, the responses of secondary school students to each negative item related to dimension Energy Conservation and Solid Waste Management aspect of EAS ranges from 54.5% to 84%. About 54.5% to 84% of students expressed an unfavourable attitude towards the environment for each Energy Conservation and Solid Waste Management item. Hence, it is concluded that more than 54% of students have a favourable attitude towards Energy Conservation and Solid Waste Management aspects of the Environment.

Taking personal responsibility for environmental concerns requires individual effort and personal drive. In this section, 28.5% of respondents agree, and 66% disagreed that waste disposal is the sole responsibility of the local authorities, and 22% agree and 54.5% disagree that preparing decorative items with waste materials is merely a waste of time. It indicates a positive attitude towards the recycling and reuse of solid waste materials.

Environmental awareness programs should be encouraged in our secondary schools. It will motivate the students to develop environmental attitudes and behaviour and have solutions to different environmental threats. Based on this line, 73.5% were unfavourable, and 20% favourable towards no need to create awareness on consumption and saving of electricity and fuels; 84% disagree, and 2% agree that more and more hydroelectric power stations should be created to meet the need of people.

Conclusion:

In conclusion, the findings demonstrate that a significant majority of secondary school students (over 61.5%) possess a favourable attitude toward energy conservation and solid waste management. The high level of agreement regarding individual responsibility—particularly in electricity saving and plastic reduction—suggests that students are not only aware of environmental issues but also recognise their personal role in mitigating them.

Furthermore, the data reveals that students value sustainable practices like recycling and the use of renewable energy over traditional disposal methods. While most students exhibit a positive environmental consciousness, the presence of unfavourable responses highlights a need for continued educational programmes. Strengthening school-based awareness initiatives will be essential to bridging the gap between theoretical knowledge and consistent, high-quality environmental behaviour.

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