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RESEARCH ARTICLE

DEVELOPMENT AND STANDARDISATION OF ENVIRONMENTAL CONSERVATION AWARENESS SCALE (ECAS)

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ABSTRACT

Environmental awareness is discussed and studied by many. However, to make an impact, we must be aware of the problems and solutions. Some ways to take care of our environment are to practice recycling, follow proper garbage disposal protocol, avoid using our cars too much and rely more on public transportation instead.Every day we hear about how our planet is changing. The rising levels of carbon dioxide result in changes in the atmosphere. Carbon dioxide traps heat, which leads to a rise in atmospheric temperature. When a plant dies, more carbon dioxide is released into the air. This can cause more temperature changes and less oxygen in the air. To help slow down this process, we have to take care of the environment before it is too late. One of the first steps to becoming more environmentally conscious or environmentally aware is by reducing our energy usage. This may also mean driving less polluting vehicles.Environmental awareness is critical because it can help us to become aware of the impacts on the Earth created by human activities, leading to global warming. It can also help us to create a more sustainable world by promoting renewable resources, such as solar, wind and **water**.This paper gives a clear picture of the development and standardisation of the environmental conservation awareness scale, enabling the assessment of college students' understanding of environmental conservation awareness. Consequently, the researchers have developed and standardised an instrument to evaluate this awareness and has achieved success in this initiative.

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INTRODUCTION

Environmental awareness is discussed and studied by many. However, to make an impact, we must be aware of the problems and solutions. Some ways to take care of our environment are to practice recycling, follow proper garbage disposal protocol, avoid using our cars too much and rely more on public transportation instead. Every day we hear about how our planet is changing. The rising levels of carbon dioxide result in changes in the atmosphere. Carbon dioxide traps heat, which leads to a rise in atmospheric temperature. When a plant dies, more carbon dioxide is released into the air. This can cause more temperature changes and less oxygen in the air. To help slow down this process, we have to take care of the environment before it is too late. One of the first steps to becoming more environmentally conscious or environmentally aware is by reducing our energy usage. This may also mean driving less polluting vehicles.Environmental awareness is critical because it can help us to become aware of the impacts on the Earth created by human activities, leading to global warming. It can also help us to create a more sustainable world by promoting renewable resources, such as solar, wind and **water**.The college environment includes the physical, academic, and social settings that impact student well-being and learning. A healthy physical environment incorporates green spaces, walkability, and sustainable practices, which can improve mental and physical health.

Environmental Awareness and Sustainability: Students are increasingly conscious of environmental issues and are actively involved in promoting sustainable practices. Here are ways college students can contribute to a healthier planet:

- **Reduce Waste**: Use reusable water bottles instead of single-use plastic, participate in campus recycling programs, and try to limit food waste.
- **Conserve Resources**: Be mindful of water usage and turn off lights and electronics when not in use.
- **Sustainable Transport**: Walk, bike, or use public transport, when possible, to reduce carbon emissions.
- **Environmental Education**: Take courses or participate in workshops to learn more about the climate crisis and how to help. Environmental education can also enhance creativity and problem-solving skills.
- **Get Involved**: Join or start campus environmental clubs and initiatives to make a broader impact.

College students can practice conservation through daily actions like reducing energy and water use, practicing the three R's (reduce, reuse, recycle), and making sustainable choices. Environmental conservation awareness for college students can be fostered through curriculum integration, hands-on projects, and individual lifestyle

changes like reducing plastic use, conserving water and energy, and proper waste disposal. Students can also participate in eco-clubs, volunteer for local cleanups, and share knowledge on social media to encourage broader action.

Integrating environmental education

- **Incorporate into curriculum:** Weave environmental themes like climate change, pollution, and conservation into various subjects, not just science.
- **Campus-wide awareness:** Promote environmental awareness through campus-wide campaigns, workshops, and events that highlight the importance of safeguarding the environment.

Spreading awareness

- **Share knowledge:** Use social media to share links and information about environmental conservation to help educate peers.
- **Be a role model:** Inspire others to adopt eco-friendly habits by demonstrating them through personal actions, like avoiding single-use plastics.
- **Use resources wisely:** Educate others on the importance of preserving natural resources like soil, forests, and wildlife.

Environmental conservation awareness among college students is generally high in knowledge but often moderate in practice. Effective strategies to bridge this gap include integrating environmental education into the curriculum, providing hands-on activities, and fostering a campus culture that encourages sustainable behaviors.

Key Areas of Environmental Awareness & Action

- **Waste Management:** Understanding the importance of the 5R's concept: refuse, reduce, reuse, recycle, and recover. Students can participate in campus recycling programs and community clean-ups.
- **Energy Conservation:** Simple daily habits such as turning off lights and electronic devices when not in use, using energy-efficient light bulbs, and utilizing natural daylight can significantly reduce the carbon footprint.
- **Water Conservation:** Conserving water by fixing leaks promptly, taking shorter showers, and ensuring faucets are turned off tightly are essential practices.
- **Sustainable Transportation:** Encouraging walking, biking, or using public transportation for daily travel helps reduce air pollution and greenhouse gas emissions.
- **Biodiversity and Habitat Protection:** Awareness of the importance of preserving natural resources, planting trees, and protecting endangered species and their habitats.

By moving beyond theoretical knowledge to practical, every-day action, college students can become effective agents of change, contributing to a more sustainable future. Environmental conservation awareness is needed for college students to foster sustainability, develop critical thinking skills, and empower them as future leaders to address environmental challenges. This awareness helps students understand the impact of human activities, promotes responsible resource management, and encourages participation in creating sustainable practices and solutions within their communities and professional lives.

Why college students need environmental conservation awareness

- **Develops responsibility and critical thinking**: Awareness helps students connect with the natural world, understand complex environmental issues, and develop a sense of responsibility to protect it.
- **Promotes sustainable living**: It encourages students to adopt and promote sustainable practices like waste reduction, energy conservation, and responsible water use in their daily lives and future careers.
- **Fosters future leadership**: College students are a powerful force for change. Environmental awareness equips them to become informed and engaged citizens who can advocate for policy changes, innovate solutions, and lead conservation efforts for future generations.
- **Encourages community engagement**: It motivates students to participate in local clean-up events, plant trees, and collaborate with environmental organizations to strengthen community involvement in conservation.
- **Improves understanding of the environment**: Environmental education helps students understand the interconnectedness of ecosystems and how human actions affect them, which is crucial for making informed decisions.
- **Supports a holistic education**: Integrating environmental themes across subjects like science, geography, and even literature provides students with a well-rounded understanding of environmental issues and their impacts.

Environmental conservation awareness is vital for college students as it equips them to become informed, responsible, and proactive citizens capable of addressing complex global challenges like climate change, pollution, and resource depletion. This awareness fosters the skills and attitudes needed to build a sustainable future. The specific needs and benefits of environmental conservation awareness for college students include:

Developing Essential Knowledge and Skills

- **Understanding Interconnectedness:** Awareness helps students understand the delicate and complex interrelationships between human activities and natural ecosystems (social, economic, political, and ecological).
- **Critical Thinking & Problem Solving:** Engaging with real-world environmental issues encourages research, investigation, and analysis, which enhances critical thinking, creativity, and problem-solving abilities.
- **Informed Decision-Making:** Equipped with knowledge about sustainability and conservation, students can make informed decisions in their personal lives (e.g., consumption habits) and future professional roles (e.g., urban planning, policy-making).
- **Scientific Literacy:** Environmental education often involves hands-on, practical activities that build confidence in science and technology and help students link theoretical knowledge with real-life experiences.

Importance of Environmental conservation awareness: Environmental conservation awareness is crucial for college students as it fosters a sense of responsibility, encourages sustainable habits, and equips them with the knowledge to become future leaders and problem-solvers for environmental challenges.

This awareness promotes informed decision-making, develops critical thinking skills, and inspires students to take action through personal choices and advocacy. Environmental conservation awareness is crucial for college students as it equips them with the knowledge, skills, and motivation to address pressing global challenges like climate change and pollution.

This awareness transforms them into responsible, proactive citizens and future leaders capable of building a sustainable and healthy planet. Ultimately, environmental awareness for college students is not just about knowledge; it is about cultivating a lifestyle and mindset that ensures harmony between human development and the natural world. Hence the investigators decided to develop and standardise Environment Conservation Awareness Scale.

LITERATURE REVIEW

Gina K. Thomas, *et al*., (2020), studied about a study of Awareness and Attitude of college students towards Environmental pollution. The survey had 22 questions that tested their knowledge, awareness, behaviour and attitude of college students on environmental pollution. The data was statistically analysed by IBM SPSS 20. The study enabled the students to analyse, evaluate and draw inference about issues related to environment. However, the students had high levels of concern, awareness and knowledge about the environmental pollution and understood how harmful human activities are to the environment. But their attitude and behaviour for the betterment of environment is not much promising.

Satyanarayana, D., (2021), studied about a study on Environmental Awareness and Attitude of College Students. In this paper an attempt has been made to study the awareness and attitude of college students towards environment and related issues. To study this phenomena survey method has been used. The study was conducted on 160 students (80 girls and 80 boys). The students were randomly selected from different colleges of Karimnagar district of Telangana. For the purpose of data collection environmental attitude scale and environmental awareness tests were administered on them. The data was collected personally from the colleges. The collected data are tabulated and computed applying simple statistical tools. The status of EE in higher education system is really not satisfactory and there is a need to standardized and upgrade the education system as a whole. The results revealed that both male and female have equal awareness towards environment and female students are having better attitude towards environment than male students.

Tarak Nath Bhunia, and Susanta Kumar Giri., (2025), studied about the study on Environmental Awareness among undergraduate students in Medinipur District, West Bengal. This study examined environmental awareness among undergraduate students in the Medinipur district of West Bengal, focusing on differences based on gender, locality, and academic stream. Using a descriptive survey method, data were collected from 426 students across eight randomly selected government colleges using a standardized Environmental Awareness Scale developed by the researcher. The analysis employed independent samples t-tests and Welch's ANOVA with Games-Howell post hoc tests. Findings revealed that girls had significantly higher environmental awareness than boys, and science students outperformed their arts and commerce counterparts. However, no significant difference was found between rural and urban students.

OBJECTIVE: To develop and standardise a new tool namely, Environment Conservation Awareness Scale to measure the Environment Conservation Awareness of the college students.

SAMPLE: Random sampling technique has been used in the process of data collection from the sample of 100 college students.

METHOD OF THE STUDY

Normative survey method has been used in the present study.

TOOL: As there is no proper tool available to measure Environment Conservation Awareness of the college students, the investigators, according to the present situation decided to develop and standardise a tool namely Environment Conservation Awareness Scalein order to realize their objective.In order to develop and standardise the awareness scale, the investigators collected variety of information regarding the environmental conservation awareness required for the college students from the experts, teachers handling science subject and from other web resources. Keeping the collected information into consideration the researchers developed 50 statements which constitutes the responses YES and NO which constitutes the Environment Conservation Awareness Scalefor pilot study. The maximum mark for a statement is 1 and the minimum mark is 0. Therefore, one can get a maximum score of '50' and a minimum score of '0' for this scale.Copies of this test were distributed to 100 college students studying in the Arts and Science colleges in Cuddaloredistrict of Tamilnadu, India. For all the items (50), after scoring each paper, the correction for chance success was made using the following formula developed by **Lindman (1971)**.

$$CS = R - \frac{W}{N-1}$$

Where,

CS	-	Corrected score
R	-	Right answer (response)
W	-	Wrong answer (response), and
N	-	Number of distracters (alternatives).

The Environment Conservation Awareness scores for all the 100 subjects were arranged in the descending order from the top-most scorer to the bottom-most scorer. Then they were subjected to item analysis. Item analysis is an important step in the validation of any test. The two criterion groups - the upper group consisting of 27 papers (top 27%) and the lower group of 27 papers (bottom 27%) were formed."The difficulty of an item may be defined as the proportion of the examinees that marked the item correctly. The level of difficulty is indicated by a numerical term, the difficulty index (Remmers *et al.,* 1967). Arbitrarily the difficulty of an item may be given by a panel of experts. But there is a standard and dependable method for it. "The difficulty index of each item is found by averaging the percents correct in the upper and lower groups. This percentage is approximate but is accurate enough for most purposes and has the great advantage of easy computation" (Garrett, 1979). The investigator followed the procedure outlined by Ebel (1966) in computing the indices of item difficulty and discrimination. "Individuals are discriminated when they obtain different scores and are not discriminated when they obtain identical scores" (Guilford, 1954). In the present investigation, the upper group has 27 papers (27%) and the lower group has 27 papers (27%). For each item, the counts from the upper and lower groups to the correct response were added and then divided by the sum of the number of papers in the upper and the lower groups. The resultant decimal fraction was multiplied by 100 in order to express the quotient in percentage.

$$\text{Index of difficulty} = \frac{RU}{NU} + \frac{RL}{NL} \times 100$$

Where,

RU=Right response in the upper group
RL=Right response in the lower group
NU=Number of subjects in the upper group
NL=Number of subjects in the lower group

The measure of item difficulty is an inverse measure. The higher the numerical value of this index of difficulty, the easier the item. In order to find out the index of discrimination for an item, the total number who gave the correct response for that item in the lower group was subtracted from the total number who gave the correct response for that item in the upper group and this difference was divided by the number of subjects either in the upper group or lower group and the quotient expressed as a decimal fraction is the index of discrimination.

$$\text{Index of discrimination} = \frac{UR - LR}{NU \ (or) \ NL}$$

Where,

UR	=	correct responses in the upper group
LR	=	correct responses in the lower group
NU (or) NL	=	number of subjects in the upper group orlower group

The index of difficulty and the index of discrimination for all the 50 items in the Environment Conservation Awareness Scalefor the

college students administered for the purpose of pilot study were thus computed (Vide: Table-1).

Table 1. Item analysisindices of difficulty and discrimination forenvironment conservation awareness scale (ecas)

S. No	INDEX OF DIFFICULTY	INDEX OF DISCRIMINATON	ITEM SELECTED
1	62.96296296	0.333333333	SELECTED
2	70.37037037	0.407407407	SELECTED
3	92.59259259	0.407407407	NOT SELECTED
4	66.66666667	0.37037037	SELECTED
5	62.96296296	0.333333333	SELECTED
6	81.48148148	0.518518519	SELECTED
7	77.77777778	0.481481481	SELECTED
8	96.2962963	0.518518519	NOT SELECTED
9	81.48148148	0.592592593	SELECTED
10	55.55555556	0.407407407	SELECTED
11	70.37037037	0.333333333	SELECTED
12	81.48148148	0.666666667	SELECTED
13	81.48148148	0.444444444	SELECTED
14	92.59259259	0.259259259	NOT SELECTED
15	62.96296296	0.333333333	SELECTED
16	70.37037037	0.333333333	SELECTED
17	77.77777778	0.185185185	NOT SELECTED
18	70.37037037	0.407407407	SELECTED
19	62.96296296	0.407407407	SELECTED
20	81.48148148	0.444444444	SELECTED
21	37.03703704	0.074074074	NOT SELECTED
22	70.37037037	-0.037037037	NOT SELECTED
23	81.48148148	0.666666667	SELECTED
24	92.59259259	0.703703704	NOT SELECTED
25	55.55555556	0.407407407	SELECTED
26	88.88888889	0.666666667	SELECTED
27	70.37037037	0.185185185	NOT SELECTED
28	55.55555556	0.407407407	SELECTED
29	81.48148148	0.518518519	SELECTED
30	70.37037037	0.481481481	SELECTED
31	74.07407407	0.592592593	SELECTED
32	62.96296296	-0.259259259	NOT SELECTED
33	81.48148148	0.518518519	SELECTED
34	18.51851852	0.111111111	NOT SELECTED
35	81.48148148	0.592592593	SELECTED
36	48.14814815	0.333333333	SELECTED
37	74.07407407	0.444444444	SELECTED
38	48.14814815	0.259259259	NOT SELECTED
39	81.48148148	0.592592593	SELECTED
40	81.48148148	0.518518519	SELECTED
41	66.66666667	0.37037037	SELECTED
42	70.37037037	0.481481481	SELECTED
43	62.96296296	0.333333333	SELECTED

Any item whose difficulty index is lower than 10% (or) higher than 90% should be considered as worthless for measurement (Remmers *et al.,* 1967). Any item whose index of discrimination is above 0.30 should be considered as reasonably good item (Ebel, 1966). In the present study, only such of those items having the difficulty indices range from 30% to 90% and whose indices of discrimination ranging from 0.30 to 0.80were selected. Thus 11 statements were deleted on the above principle and only 32statements were retained in the final form of the Environment Conservation Awareness Scale, (Vide: Table -1). The final form of the scale contains 32statements for 32marks and needs 40 minutes for a college student to answer.

Table 2. The levels of the Environment Conservation Awareness Scalehas been given below

LEVELS	SCORING RANGE
Low level of Environment Conservation Awareness	0 - 8
Average level of Environment Conservation Awareness	9 - 24
High level of Environment Conservation Awareness	25 - 32

THE RELIABILITY AND THE VALIDITY: The Environment Conservation Awareness Scalehas construct validity as the items were selected following rigid item analysis procedure described above. The reliability of the scale has been found to be 0.81 using the test-retest method.Its intrinsic validity was found to be 0.90. Thus, the Environment Conservation Awareness Scalehas validity and reliability.

CONCLUSION

The tool namely Environment Conservation Awareness Scalehence developed and standardised according to the prescribed norms and contributed to the field of education.

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