

**ASSESSMENT OF ECOLOGICAL AWARENESS, PERCEPTION AND ATTITUDE TOWARDS ENVIRONMENTAL EDUCATION AMONG PRE-SERVICE SCIENCE TEACHERS IN FEDERAL UNIVERSITY OF TECHNOLOGY, MINNA**

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**ABSTRACT**

This study explores the levels of ecological awareness, perception and attitude towards environmental education among pre-service science teachers at the Federal University of Technology Minna, Niger State, Nigeria. The research employs a survey research design through the use of a questionnaire named QEAPATEE which was administered through a face-to-face format and analysis was drawn from 220 random sampled respondents of 525 total population. Demographic analysis reveals a balanced gender distribution, varied levels, and age groups among the participants. The data is analyzed using statistical methods of frequency counts, percentages, mean scores ( $\bar{x}$ ) and standard deviations. The findings indicate that pre-service science teachers at FUT Minna exhibit moderate ecological awareness. Specifically, respondents expressed agreement on the importance of fostering ecological awareness for a healthier environment, the influence of environmental education programs on their awareness, and the appreciation of sustainable practices in their community. The study also reveals a positive and moderate level of ecological perception among pre-service science teachers. Participants acknowledge the significance of biodiversity, the impact of human activities on its decline and activities that promote biodiversity. Additionally, respondents recognize the essential role of environmental education in curriculum development for an ecologically aware society. Furthermore, the research identifies a positive and moderate ecological attitude among pre-service science teachers. The participants demonstrate positive attitudes towards incorporating environmental education into school curricula, supporting initiatives for hands-on experiences in nature and recognizing the role of a strong foundation in environmental education for informed decision-making.

**Keywords:** Ecological Awareness, Ecological Perception, Ecological Attitude, Environmental Education & Pre-service Science Teachers.

**INTRODUCTION**

Environmental Education (EE) is all about helping people learn how to protect the environment and make choices that are good for the Ecosystem. It's like teaching them the know-how and skills to change their daily habits and do things that don't harm the Environment. Environmental education often leads to shifts in personal behavior. Environmentally Educated individuals are more likely to engage in eco-friendly practices, such as energy conservation, recycling, and sustainable consumption (Dietz, 2019). The goal is to encourage people to live in a way that keeps the environment healthy for the long run. This means learning about things like conserving water, reducing waste, and being kind to nature. Environmental Education is like a guide to being a responsible citizen of Nigeria.

Wals et al. (2014) considered the learning content of environmental education to be multi-disciplinary, based on environmental problem assessment, critical thinking, morality, creativity, and make judgments on environmental issues. William Stapp and his colleagues advocated for a definition of environmental education based on practical principles. They believed that focusing on understanding the environment could lead to meaningful change through action. That's why they placed importance on hands-on experience in environmental education, as it emphasized taking what you know and using it to solve real problems related to natural resources. In their view, taking action and gaining practical experience were more valuable than simply following rigid rules. By following this thought process, environmental education transformed into a



crucial and creative approach for answering questions and understanding values. This approach saw environmental education as a way to assess the actual environment and engage in scientific exploration. It also integrated human values and ethical standards into the real-world context of human existence.

Ecological awareness, in simple terms, means understanding and caring about the environment and all the living things in it. Ecological awareness is a concept that is widely recognized in environmental education and conservation efforts. It is about being conscious of the natural ecosystem, interconnectedness, and the impact of human actions on it. Ecological awareness is a fundamental aspect of environmental education (Tilman, 2014). At the core of ecological awareness is the understanding that every action, no matter how small, can ripple through the interconnected web of life. This interconnectedness extends across ecosystems, species, and generations, emphasizing the profound influence that our choices and behaviors have on the natural world. Ecological awareness influences personal choices and behaviors. It leads individuals to adopt eco-friendly practices, such as reducing energy consumption, conserving water, and making sustainable food choices. These actions reflect a commitment to minimizing one's ecological footprint (Dietz, 2019). Ecological awareness is grounded in knowledge about ecosystems, climate systems and the myriad species that inhabit our planet. It entails knowing the environmental challenges we face, such as climate change, habitat loss and pollution, and recognizing the science behind these issues. It is the key to securing a sustainable future for our country and ensuring that future generations inherit a healthy and thriving Nigeria.

Ecological Perception Towards Environmental Education is the way individuals and societies perceive their relationship with the environment, this plays a fundamental role in shaping the effectiveness of environmental education efforts. How people view the natural world influences their receptivity to environmental dynamics which determine the actions they take. Ecological perception is the foundation upon which attitudes and values about the environment are built. People who perceive themselves as integral parts of the ecosystem, appreciate the intrinsic value of nature to develop strong environmental ethics and a sense of responsibility (Chawla, 2017). The way individuals perceive their relationship with the environment significantly affects their motivation to engage in environmental education. A strong ecological perception can serve as a powerful motivator for learning about, and acting to protect the environment (Nisbet et al., 2019). Ecological perception informs the decision-making process. Individuals with a well-developed ecological perception are more likely to make decisions that prioritize environmental sustainability, such as supporting conservation efforts, reducing their ecological footprint, and advocating for environmental policies.

Ecological perception is the way individuals perceive and understand the environment around them, including its ecological systems, biodiversity and the interconnectedness of all living beings. It plays a crucial role in environmental education, as it shapes the way individuals engage with, appreciate, and protect the natural world. The ecological perception of pre-service teachers is a vital component of effective environmental education. Their understanding of ecological concepts, connection to nature, and eco-centric values significantly influence their teaching efficacy and their ability to inspire environmental awareness in their future students (Tidball, 2015). By nurturing their ecological perception through experiential learning, mentorship, and exposure to diverse perspectives, we ensure that they become effective environmental educators and advocates for a sustainable future.

The ecological attitude of pre-service teachers toward environmental education is a crucial aspect of their preparedness to teach this subject effectively. These future educators' beliefs, values, and perceptions regarding the environment play a significant role in shaping how they approach and deliver environmental education to their students. Ecological attitude refers to an individual's beliefs, values, and feelings regarding the natural environment and the ecosystems that comprise it. It encompasses a person's ecological awareness, sense of responsibility, and commitment to environmental conservation and sustainability. In the context of pre-service teachers, their ecological attitude influences how they perceive, prioritize, and communicate environmental education concepts. Pre-service teachers should possess a foundational understanding of ecological systems, environmental issues, and the interconnectedness of all living organisms. This awareness forms the basis for effective environmental education, allowing them to impart essential knowledge to their students. An ecological attitude often involves a personal connection to nature. Pre-service teachers who have a deep affinity with the environment are more likely to convey their passion and connection to nature to their students, fostering a love for the natural world. The ecological attitude of pre-service teachers can significantly influence their students' perceptions of environmental education. Passionate and responsible teachers can



inspire their students to develop a deeper connection to the environment and a commitment to sustainability. An ecological attitude can help pre-service teachers nurture a sense of environmental stewardship in their students. They may encourage students to become responsible citizens who care for the environment and actively participate in conservation efforts.

### **Statement of the Problem**

With the critical level of environmental challenges Nigeria is presently facing, the role of Environmental Education, particularly within FUT Minna, in fostering ecological awareness and shaping attitudes toward environmental issues cannot be overstated. With the imminent threats of climate change, habitat loss, species extinction, and resource depletion. One prevalent issue linked to the Federal University of Technology Minna, Niger State is inadequate waste management, particularly in the vicinity of student hostels. This mismanagement frequently leads to the pollution of the hostel surroundings and the clogging of drainage systems. This situation raises questions about the level of ecological awareness among the university community, given their exposure to educational experiences related to ecological management and environmental protection. So it is paramount to examine the level of awareness, perception and attitude of pre-service science teachers, who are the future educators and teachers, how adequately they are equipped with ecological knowledge and possess attitudes that align with the principles of environmental education and sustainability. One prevalent issue linked to the Federal University of Technology Minna in Niger State is inadequate waste management, particularly in the vicinity of student hostels. This mismanagement frequently leads to the pollution of the hostel surroundings and the clogging of drainage systems. This situation raises questions about the level of ecological awareness among the university community, given their exposure to educational experiences related to ecological management and environmental protection. It is essential to examine the underlying reasons for these challenges and work toward finding solutions.

Inadequate ecological awareness or a lack of positive perceptions and attitudes among pre-service science teachers could lead to deficiencies in environmental education, potentially perpetuating the cycle of environmental degradation. This project will explore whether the existing environmental education initiatives within department of science education, FUT Minna are effective in instilling ecological awareness and fostering favorable attitudes among pre-service science teachers, thus providing valuable insights for curriculum development, teaching strategies, and policy enhancements in the field of environmental education.

### **Aim and Objectives of the Study**

The aim of this research is to examine the ecological awareness, perceptions and attitudes of pre-service science teachers in science Education, Federal University of Technology, Minna, with a specific focus on environmental education. The following are objectives of this study:

1. To determine the level of Ecological Awareness of environmental education among pre service science teachers.
2. To Examine the Ecological Perception towards Environmental Education among pre-service science teachers.
3. To examine the Ecological attitude towards Environmental Education among pre-service teachers.

### **Research Questions**

1. What is the level of Ecological Awareness of environmental education among pre service science teachers of FUT Minna?
2. What is the Ecological Perception towards Environmental Education among pre-service science teachers of FUT Minna?
3. What is the Ecological attitude towards Environmental Education among pre-service teachers of FUT Minna?

### **Significance of the Study**

The study on survey of ecological awareness, perception and attitude towards environmental education among pre service science teachers in FUT Minna, science education department, will be of immense benefit to educational institutions, pre-service science teachers, policy makers, curriculum planners.



**METHODOLOGY**

Descriptive survey research design was used for this study. This design was deemed most suitable because it involves the collection of opinions and perspectives from pre-service science teachers in science education department Federal University of Technology Minna, using questionnaires as the primary data collection tool. The population for the survey study will constitute all the pre-service science teachers in science education FUT Minna which comprises of 525 pre-service teachers. A two-stage sampling technique was utilized to choose 220 pre-service teachers. In the first stage, judgmental sampling was employed to select pre-service teachers based on their academic levels, specifically within the range of 100-500 Levels. Subsequently, a simple random sampling technique guided by Krejcie and Morgan's table was employed.

A structured survey questionnaire named **Questionnaire on Ecological Awareness, Perception, and Attitude Towards Environmental Education (QEAPATEE)** was designed on the basis of the Ecological Awareness, Perception, and Attitude Towards Environmental Education to elicit information from pre-service science teachers of science education department FUT Minna. The instruments comprise of two (2) section response patterns, Section A comprises of the Bio-data of the pre-service teachers while section B comprises of 24 items to address the research questions. Thus, **QEAPATEE** is presented in a modified five-point Likert Rating scale which is composed of Strongly Agree (SA) =5 points, Agree (A) =4 points, Undecided (U) =3points, Disagree (D) =2 points and Strongly Disagree (SD) =1 point.

The instrument underwent a process of validation for both face and content validity. In order to assess the reliability of the questionnaire, a pilot study was conducted involving 30 students from the Educational Technology Department within the SSTE. Since these students are not a part of the study, their participation was particularly valuable. The pilot study served as a means to evaluate the questionnaire's clarity, readability, appropriateness and adequacy. The scores collected during the pilot testing were then subjected to analysis using Cronbach's alpha. The outcome of this analysis revealed a reliability coefficient of 0.79 for the **QEAPATEE**.

The data gathered underwent analysis, employing various statistical methods such as frequency counts, percentages, mean ( $\bar{x}$ ) scores and the standard deviation for each questionnaire item in order to address the research questions using the Statistical Package for Social Sciences (SPSS), version 25. The criteria for determining agreement and disagreement for items in **QEAPATEE** will be based on the following mean ranges: a mean range of 0 to 2.99 will signify disagreement, while a mean range of 3.0 to 5.0 will indicate agreement.

**RESULT AND DISCUSSION OF FINDINGS****Analysis of Demographic Data****Demographic Distribution of Respondents**

Gender	Frequency	Percent	Valid Percent	Cumulative Percent
MALE	127	57.7	57.7	57.7
FEMALE	93	42.3	42	100.0
Total	220	100.0	100.0	

  

Level	Frequency	Percent	Valid Percent	Cumulative Percent
100L	55	25.0	25.0	25.0
200L	55	25.0	25.0	50.0
300L	55	25.0	25.0	75.0
500L	55	25.0	25.0	100.0
Total	220	100.0	100.0	

  

Age Bracket	Frequency	Percent	Valid Percent	Cumulative Percent
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15-18	3	1.4	1.4	1.4
19-22	70	31.8	31.8	33.2
23-26	103	46.8	46.8	80.0
27-30	34	15.5	15.5	95.5
31 ABOVE	10	4.5	4.5	100.0
Total	220	100.0	100.0	

The table above shows that the student in the sampled school is FUT Minna, School of Science and Technology Education (SSTE), Department of Science Education, they constituted 220 respondents which is 100% of the sample. The number of male respondents is 127, which is 57.7% and the number of female respondents is 93, which is 42.3%. The questionnaire was administered to all levels except 100L which was used to test for reliability; 200L (30.0%), 300L (18.57%), 400L (41.43%) and 500L (10.00%). Their ages ranged between 15-18 years is 1.40%, 19-22 years is 31.8%, 23-26 years is 46.8%, 27-30 years is 15.5% and for above 30 years 4.5%.

#### Analysis of Research Questions

The data collected were analyzed using mean and standard deviation to answer the given study questions. The following were the questions and the analysis:

**Research Question 1:** What is the level of Ecological Awareness of environmental education among pre service science teachers of FUT Minna.

#### Analysis of Mean (x) of Respondents on the level of ecological awareness of environmental education.

S/NO.	ITEMS	N	Mean	Std. Deviation	Decision
1.	Fostering ecological awareness is essential for creating a greener and healthier planet.	220	3.86	1.12	Accepted
2.	The environmental education programs I have participated in have increased my awareness of ecological issues.	220	3.68	1.21	Accepted
3.	Understanding the interconnectedness of ecosystems is crucial for environmental sustainability.	220	3.80	1.13	Accepted
4.	Environmental education has influenced my awareness of the impact of waste disposal methods on the environment.	220	3.65	1.25	Accepted
5.	Environmental education has helped me appreciate the value of sustainable practices in my community.	220	3.73	1.23	Accepted
6.	Fostering a connection between individuals and their local environment is crucial for ecological awareness	220	3.87	1.10	Accepted
7.	Schools and communities should prioritize environmental education for a sustainable future.	220	3.85	1.12	Accepted
8.	Individual actions, such as reducing waste, can contribute to a healthier environment.	220	3.86	1.08	Accepted
9.	Government policies should prioritize environmental protection and conservation efforts.	220	3.68	1.23	Accepted
10.	Fostering a connection between individuals and their local environment is crucial for ecological awareness.	220	3.75	1.19	Accepted
	GRAND MEAN		3.89		



The result presented in the table above revealed that the respondents agreed that items 1,2,3,4,5,6,7,8, 9 and 10 were accepted which indicates that there is Moderate Awareness. The table has a grand mean ( $\bar{x}$ ) of 3.89 which implied that there is moderate Ecological Awareness among pre-service science teachers of FUT Minna to Environmental Education.

**Research Question 2:** What is the Ecological Perception towards Environmental Education among pre-service science teachers of FUT Minna?

**Mean ( $\bar{x}$ ) of respondents on the level of Ecological Perception towards Environmental Education**

S/NO.	ITEMS	N	Mean	Std. Deviation	Decision
1.	Biodiversity refers only to the variety of plant species	220	3.76	1.12	Accepted
2.	Biodiversity is important for maintaining ecological balance and stability in natural ecosystems	220	3.79	1.05	Accepted
3.	Human activities, such as deforestations and pollution are major contributions to the decline in biodiversity	220	3.85	1.01	Accepted
4.	There are activities that promote biodiversity like planting, recycling and so on	220	3.78	1.10	Accepted
5.	Incorporating environmental education into curriculum of schools is essential an ecologically aware society.	220	3.89	0.96	Accepted
6.	Deeper understanding of ecosystems contributes to a greater sense of responsibility for environmental stewardship.	220	3.91	0.94	Accepted
7.	Environmental education has influenced my awareness of the impact of waste disposal methods on the environment.	220	3.75	1.11	Accepted
8.	Education about the importance of preserving natural ecosystems should start at an early age.	220	3.82	1.07	Accepted
9.	Technological advancements should prioritize environmental sustainability over rapid economic growth.	220	3.86	1.05	Accepted
10.	There is a sense of connection to the natural world when spending time outdoors, and I believe this connection is important for ecological awareness.	220	3.72	1.14	Accepted
	GRAND MEAN		3.81		

The result presented in the table above revealed that the respondents agreed that items 1,2,3,4,5,6,7,8,9 and 10 were accepted which indicates that there is Moderate awareness. The table has a grand mean ( $\bar{x}$ ) of 3.81 which implied that there is moderate Ecological Perception towards Environmental Education among pre-service science teachers of FUT Minna.

**Research Question 3:** What is the Ecological attitude towards Environmental Education among pre-service teachers of FUT Minna?



**Mean (x) of respondents on the level of Ecological attitude towards Environmental Education**

S/NO.	ITEMS	N	Mean	Std. Deviation	Decision
1.	I believe that incorporating environmental education into school curricula is essential for fostering ecological attitude.	220	3.79	1.07	Accepted
2.	I feel a positive attitude towards learning about the impact of human activities on the environment.	220	3.79	1.18	Accepted
3.	I believe that environmental education plays a crucial role in shaping responsible and environmentally conscious citizens.	220	4.14	1.00	Accepted
4.	I support initiatives that promote hands-on experiences in nature as part of environmental education.	220	3.96	1.11	Accepted
5.	I believe that having a strong foundation in environmental education is important for making informed decisions in daily life.	220	3.80	1.19	Accepted
6.	I feel that environmental education contributes to a sense of environmental responsibility among individuals.	220	3.72	1.17	Accepted
7.	I am supportive of educational programs that teach the importance of sustainable living practices.	220	3.69	1.08	Accepted
8.	Schools incorporating community partnerships enhances the impact of environmental education.	220	3.69	1.08	Accepted
9.	I believe that a positive attitude towards environmental education is crucial in life.	220	3.64	1.11	Accepted
10.	I support educational initiatives that encourage students to explore and propose innovative solutions to environmental problems.	220	3.35	1.16	Accepted
	GRAND MEAN		3.82		

The result presented in the table above revealed that the respondents agreed that items 1,2,3,4,5,6,7,8,9 and 10 were accepted which indicates that there is Moderate Ecological Attitude. The table has a grand mean (x) of 3.82 which implied that there is moderate Ecological Attitude towards Environmental Education among pre-service science teachers of FUT Minna.

### DISCUSSION OF RESULTS

The analysis of the research questions aimed to explore the level of ecological awareness, perception, and attitude towards environmental education among pre-service science teachers at FUT Minna. The results of the mean and standard deviation for each research question are discussed below:

#### Research Question 1: Level of Ecological Awareness

The respondents exhibited a moderate level of ecological awareness, as indicated by the grand mean (x) of 3.89. The acceptance of items such as fostering ecological awareness, the impact of environmental education programs, and understanding the interconnectedness of ecosystems suggests a positive disposition towards environmental issues. These findings are consistent with the research by (Babalola et al, 2021) which emphasized the crucial role of raising ecological awareness for sustainable practices among Nigerian educators.



**Research Question 2: Ecological Perception towards Environmental Education**

The analysis of ecological perception revealed a moderate level of awareness with a grand mean ( $\bar{x}$ ) of 3.81. The respondents acknowledged the significance of biodiversity, understanding human contributions to biodiversity decline, and the role of environmental education in promoting ecological awareness. This aligns with the findings of (Anwadike, 2020), who observed a positive correlation between biodiversity education and increased ecological perception among Nigerian educators.

**Research Question 3: Ecological Attitude towards Environmental Education**

The results indicate a moderate ecological attitude among pre-service science teachers, with a grand mean ( $\bar{x}$ ) of 3.82. Respondents demonstrated a positive attitude towards incorporating environmental education into school curricula, supporting hands-on experiences in nature, and recognizing the role of environmental education in shaping responsible citizens. These results resonate with the research conducted by (Barnes et al., 2019) in Nigeria, emphasizing the positive impact of hands-on experiences in nature on ecological attitudes.

**SUMMARY OF FINDINGS**

1. The study indicates that there is moderate Ecological Awareness among pre-service science teachers of FUT Minna to Environmental Education.
2. The study indicates that there is moderate Ecological Perception towards Environmental Education among pre-service science teachers of FUT Minna.
3. The study indicates that there is moderate Ecological Attitude towards Environmental Education among pre-service science teachers of FUT Minna.

**CONCLUSION**

In conclusion, the survey conducted among pre-service science teachers at FUT Minna has provided valuable insights into their ecological awareness, perception, and attitudes towards environmental education. The findings reveal the current state of environmental consciousness among future science educators, with implications for both teacher training and curriculum development.

1. **Ecological Awareness:** The assessment of ecological awareness among pre-service science teachers has put into focus the varying degrees of knowledge regarding environmental issues and ecological principles. Most participants demonstrated a commendable understanding.
2. **Perception Towards Environmental Education:** The study sheds light on how pre-service science teachers perceive environmental education. The positive perception observed among a significant portion of the participants indicates recognition of the importance and relevance of environmental. This positive attitude bodes well for the potential integration of environmental concepts into future teaching practices.
3. **Attitudes Towards Environmental Education:** Exploration of attitudes towards environmental education has revealed willingness among pre-service science teachers to embrace eco-friendly practices and values in their teaching methodologies. This signifies a promising foundation for the cultivation of environmentally conscious teaching strategies.

**RECOMMENDATIONS**

Based on the findings from the study, the following recommendations were made by the researcher:

1. There should be environmental education centered orientation programs organized by educational institutions to emphasize the importance of environmental awareness.
2. Addition of more topics about nature and environmental issues in the courses for future science teachers.
3. Hands on Experiences are needed. Plan activities and projects that let future science teachers do practical things to take care of the environment.
4. Encourage everyone on campus to be aware of the environment. This can be done through activities, campaigns, and making the campus eco-friendlier.
5. Invite local environmental experts to give talks or workshops. This provides valuable insights and networking opportunities for future science teachers.



6. Form a team or club on campus dedicated to promoting ecological friendly practices. This could involve students and teachers working together.

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