

**AWARENESS AND EFFECTIVENESS OF ENVIRONMENTAL EDUCATION
AMONG UNIVERSITY OF BENIN UNDERGRADUATES STUDENTS**

BY

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CERTIFICATION

This is to certify that this study was carried out by Aifuwa **AIGBOGUN** with matriculation number **EDU2102489** in the Department of Health Safety and Environmental Education, Faculty of Education, University of Benin in partial fulfillment of the award of Bachelor of Science Degree in Environmental Education.

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DEDICATION

This project is dedicated to almighty God who saw me through my undergraduate programme in the University of Benin, by giving me the strength and grace to overcome.

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ABSTRACT

The purpose of the study was to find out the awareness and effectiveness of environmental education among undergraduates in the university of Benin. Further, four (4) research questions were raised and analyzed to guide this study.

The descriptive survey research design was adopted for this study. The population comprised (44140) undergraduates students across all faculties at the University of Benin . A Simple random sampling technique was used to select a sample of 150 students from four faculties (Education(7416), Agriculture(1685), Physical Science(3283) and Engineering(5481)) . A self structured questionnaire with two sections was used as the research instrument to collect data from the sample population. The validity of the instrument was confirmed by the supervisor and two other experts in the area of health safety and environmental education. The reliability of the instrument was tested using the test-retest method. The questionnaire was administered via Google forms to facilitate data collection and a period of one week was used for distribute and collect of the questionnaire. The data collected were analyzed using descriptive statistics, including frequency counts and percentage

The findings of the study revealed that there is a high level of awareness but low

effectiveness of environmental education among undergraduates in the university of Benin. While environmental issues is been known to high level of undergraduates in the university community, lack of interest among students reduces the impact of the programmes. It was also indicated in the study that poor funding or lack of resources reduces the success of environmental education programmes, the study, it also detected in the study that the altitude of lecturers or facilitators influences how much is learnt in environmental programmes.

The researcher concludes that there is high level of awareness on environmental issues among students in the school community but low effectiveness and action of environmental programmes due to poor funding and lack of resources in environmental education programmes that will later lead lack of interest among students on issues that concerns the environment, some students are eager to adopt environmental practices, but poor funding and lack of resources reduces the success of environmental education programmes, and the content of current environmental education programmes are not made more practical and action based as it should be.

The researcher also recommended that the content of current environmental education programmes should be made more practical and action based, and including reallife environmental case studies.

CHAPTER ONE

INTRODUCTION

Background of the Study

Environmental education (EE) is critical in shaping the environmental consciousness and attitudes of future generations. As global environmental challenges such as climate change, deforestation, and pollution continue to threaten ecosystems and human life, it becomes increasingly necessary to integrate environmental education into the curricula of higher learning institutions. The University of Benin (UNIBEN), a major educational institution in Nigeria, offers various courses and programs designed to raise awareness about environmental issues and promote sustainable practices among its undergraduates. Environmental education not only aims to equip students with knowledge about ecological problems but also fosters attitudes and behaviors that support environmental protection.

Historical evidence suggests that environmental awareness programs in Nigerian universities have had mixed results. Handoyo, Astina, and Mkumbachi (2021) found that students may understand environmental problems but often fail to translate this knowledge into proenvironmental actions. This study builds on the premise that the effectiveness of environmental education programs is measured not only by the knowledge imparted but also

by the extent to which students apply this knowledge in practical, environmentally responsible actions. Environmental education aims to equip individuals with the knowledge, skills, attitudes, and behaviors necessary to foster sustainable development and responsible environmental stewardship (UNEP, 2018). It is recognized as a vital tool for promoting environmentally conscious behavior, encouraging sustainable practices, and enabling communities to address environmental challenges proactively. As underscored by Sharma et al. (2019), integrating EE within higher education curricula enhances students' understanding of complex environmental issues and motivates them to participate in sustainable actions.

The first recorded environmental education program at university of Benin (UNIBEN) aimed to address key local and global environmental issues, ranging from waste management to sustainable development. However, questions remain about the depth of students' understanding and the realworld application of their learning. Tsai and Tan (2022) have shown that while environmental education can significantly improve awareness, it does not always result in tangible behavior changes unless it is designed with practical, hands-on components to reinforce learning. This study will explore the level of awareness about environmental issues among undergraduate students at university of Benin (UNIBEN) and evaluate the effectiveness of the environmental education programs in fostering responsible

environmental behavior.

Understanding students awareness levels can help identify gaps and opportunities in the current educational framework, enabling the development of more targeted strategies to enhance environmental literacy. In recent years, environmental issues such as climate change, biodiversity loss, pollution, and resource depletion have garnered increasing attention worldwide.

As global citizens, it is essential for young adults, particularly university students, to possess a comprehensive understanding of these challenges and the role they can play in addressing them. Environmental education has emerged as a crucial tool in promoting awareness and fostering responsible behaviors towards the environment. University students represent a pivotal audience for environmental education because they are at a formative stage where attitudes and behavioral patterns are established. Their awareness levels directly influence individual practices and community engagement concerning environmental conservation. Research indicates that students' environmental awareness significantly correlates with their willingness to adopt ecofriendly behaviors (Okafor & Obinna, 2020). However, despite

the growing emphasis on EE, studies reveal disparities in awareness levels and the effectiveness of existing educational strategies across different institutions and regions.

Greta Thunberg a young climate activist who has inspired a global movement demanding action on climate change, she advocates for immediate and drastic reductions in greenhouse gas emissions and call for a transition to renewable energy 2018present (became prominent in 2018 with her school strike for climate action) Greta Thunberg has delivered many powerful speeches and statements regarding climate change and environmental justice. One of her most famous quotes from her speech at the United Nations Climate Action Summit in 2019 is:

"I have not come here to beg world leaders to care. You have stolen my dreams and my childhood with your empty words. And yet, I'm one of the lucky ones. People are suffering. People are dying. Entire ecosystems are collapsing. We are in the beginning of a mass extinction, and all you can talk about is money and fairy tales of eternal economic growth. How dare you!"

The University of Benin (UNIBEN), a leading institution in Nigeria, plays a vital role in shaping the knowledge and attitudes of future leaders. With a diverse student population,

UNIBEN provides a unique setting to assess the level of awareness regarding environmental issues and the effectiveness of educational programs aimed at equipping students with necessary skills and knowledge. Despite the growing emphasis on environmental education in curriculums and community outreach initiatives, there is a need to evaluate how well these efforts resonate with undergraduate students and whether they translate into proactive environmental stewardship. Research indicates that environmental education can significantly influence individuals' perceptions and behaviors concerning ecological sustainability. However, the extent of this influence among UNIBEN undergraduates remains under explored. In Nigeria, various initiatives, policies, and programs have been introduced to promote environmental awareness among students, including environmental clubs, seminars, workshops, and integration into academic curricula (Ola & Adeyemi, 2020). Yet, challenges persist, such as limited resources, inadequate curriculum implementation, and superficial engagement, which hinder impactful learning and behavior change among students (Adebayo & Oladipo, 2021). The University of Benin (UNIBEN) is a prominent institution committed to fostering comprehensive student development, including environmental consciousness. However, empirical evidence regarding the level of awareness and the effectiveness of environmental education among UNIBEN undergraduates remains scant. Understanding these aspects is crucial for designing targeted interventions, enhancing existing educational

strategies, and embedding sustainability principles into the university's academic culture. Recent scholarly works emphasize the transformative potential of environmental education when tailored appropriately. For instance, Eze et al. (2019) demonstrated how interactive and participatory EE methods significantly boost students' environmental awareness and activism in Nigerian universities. Similarly, Olayinka and Musa (2021) found that integrating practical environmental projects into curricula enhances students' understanding and commitment to sustainability. Conversely, studies like that of Adeoye and Adewale (2022) highlight gaps in knowledge retention and behavioral change, underscoring the need for innovative teaching approaches and continuous engagement. Furthermore, the effectiveness of EE also hinges on contextual factors such as institutional support, societal attitudes, and access to information. Liu et al. (2020) argue that without a supportive environment and active participation, awareness campaigns may have limited impact. Therefore, assessing both awareness levels and the efficacy of educational initiatives provides essential insights into improving environmental literacy.

Statement of the Problem

In recent years, environmental issues such as climate change, pollution, deforestation, and resource depletion have become pressing global concerns, significantly impacting ecological

balance, human health, and socioeconomic development. As future leaders, professionals, and citizens, undergraduate students at the University of Benin (UNIBEN) hold a pivotal role in fostering sustainable practices and advocating for environmental conservation within their communities.

Despite the recognized importance of environmental education in raising awareness and shaping environmentally responsible behaviors, there remains a significant gap in knowledge about the level of awareness and the effectiveness of existing environmental education programs among UNIBEN undergraduates. Many students may lack sufficient understanding of critical environmental issues due to inadequate curriculum coverage, limited practical exposure, or insufficient institutional emphasis on environmental literacy.

This gap is further compounded by the possible disconnect between awareness and actual behavioral change—meaning that even students who are aware of environmental challenges may not necessarily translate this awareness into proactive or sustainable actions. Consequently, the university's current efforts in environmental education may not be effectively equipping students with the necessary knowledge, attitudes, and skills to address environmental problems effectively.

The problem, therefore, revolves around understanding the extent of awareness among

UNIBEN undergraduates regarding environmental issues and evaluating how effectively existing environmental education initiatives influence their perceptions and behaviors. Without this critical understanding, it becomes challenging to develop or improve educational programs tailored to fostering genuine environmental responsibility among students.

Addressing this problem is essential for identifying gaps, designing targeted interventions, and promoting a culture of sustainability on campus and beyond. It also contributes to broader goals of environmental stewardship and sustainable development, aligning educational strategies with urgent global environmental needs.

Fostering a sense of responsibility among students can be achieved through various strategies, such as integrating sustainability topics into the curriculum, encouraging participation in environmental projects, and creating awareness campaigns. By empowering students to take active roles, educational institutions can cultivate future leaders who are committed to environmental stewardship. Additionally, incorporating practical experiences and peer-led initiatives can enhance engagement and reinforce the importance of sustainable practices. Ultimately, nurturing a culture of responsibility not only benefits the campus environment but also equips students with the values and skills necessary to address global ecological challenges effectively.

There are several factors that may contribute to the gap in understanding environmental issues among university of Benin undergraduates:

Research Questions

The following research question were raised to guide the study

1. What is the level of environmental awareness among undergraduate students at the University of Benin?
2. How effective are the environmental education programs in raising awareness about environmental issues?
3. What factors influence the effectiveness of environmental education programs at University of Benin ?
4. How can environmental education programs be improved to better engage and educate University of Benin undergraduates about environmental issues?

Purpose of the Study

One potential purpose of the study is to examine and assess the awareness and effectiveness of environmental education among University of Benin (UNIBEN) undergraduate students is to assess the current level of knowledge and understanding among this specific population regarding environmental issues. By understanding their awareness

levels, educators and policymakers can tailor educational programs and initiatives to address any gaps and improve environmental literacy among students. Additionally, evaluating the effectiveness of existing environmental education programs at UNIBEN can help identify strengths and weaknesses, leading to more targeted and impactful efforts to promote sustainability and environmental stewardship within the university community. Ultimately, this research can contribute to enhancing environmental education strategies and fostering a culture of sustainability on campus and beyond.

Significance of the Study

This study is significant in several ways:

The findings of the study will bring about educational impact understanding how aware students are of environmental issues and the effectiveness of environmental education helps to gauge their readiness to participate actively in sustainable practices. This awareness can lead to behavioral changes that promote conservation, responsible waste management, and sustainable resource utilization. By assessing the level of awareness and the effectiveness of current environmental education programs, educators and policymakers can identify gaps and strengths within the curriculum. This enables the development of more targeted, relevant, and impactful educational strategies that resonate with students' experiences and local

environmental challenges. Undergraduates are future leaders, policymakers, professionals, and influencers. Instilling strong environmental awareness during their university years can foster a sense of responsibility and stewardship for the environment, leading to informed decision making and leadership in environmental management in their future careers. Nigeria, being part of global initiatives like the Sustainable Development Goals (SDGs), needs a well informed youth population capable of driving environmental policies and interventions. This study provides vital data to evaluate current progress and inform future strategies aligned with national and international environmental objectives. Nigeria faces specific environmental issues such as pollution, deforestation, flooding, and waste management problems. Understanding how aware students are of these issues and how effectively they learn about solutions can lead to community based initiatives and innovations rooted in educated understanding. The research provides valuable insights for scholars interested in environmental education, behavioral change, and youth engagement. Policymakers can utilize findings to refine existing programs or develop new initiatives aimed at enhancing environmental literacy among young adults. Findings can promote increased involvement of students in environmental activities, club projects, campaigns, and outreach programs, creating a ripple effect within the university community and beyond. This study serves as an important baseline for longitudinal studies, enabling tracking of changes in awareness levels

and educational impacts over time, especially as environmental issues continue to evolve rapidly.

Scope and delimitation of the study

The scope of the study is awareness and effectiveness of environmental education among uniben undergraduates students and its delimited to undergraduates students in university of Benin.

Delimitation of the study

The study will be limited to undergraduate students enrolled at the University of Benin (UNIBEN). It will not include postgraduate students, staff, or students from other institutions.

This boundary ensures the findings are specific to the undergraduate population and their experiences with environmental education. Data collection will occur within a specified period, such as the academic year 2025. The attitudes, awareness levels, and effectiveness of environmental education might fluctuate over time, so the findings will reflect a snapshot rather than longitudinal changes.

Definition of Terms

Sustainability: Sustainability in this study means understanding how to meet the needs of the present generation without compromising the ability of future generations to meet their own

needs. It's about finding a balance between using natural resources and protecting the environment for the long term.

Preservation: Preservation in this study focuses on protecting natural areas and resources from human interference or alteration.

Stewardship: Stewardship in this study involves taking responsibility for the care and management of the environment. It's about actively participating in protecting and improving the natural world.

Depletion: Depletion in this study involves using up natural resources faster than there can be replenished

Fostering: in the context of this study fostering refer to nurturing and encouraging positive behaviors, attitudes and actions towards the environment.

Perception: Perception is the process by which we organize and interpret sensory information to understand and experience the world. It involves recognizing and interpreting sensory stimuli, selecting certain aspects of the environment, organizing these selected inputs, and interpreting them to form a meaningful understanding.

Undergraduate students : are individuals enrolled in a university or higher education

institution pursuing their first academic degree, typically a bachelor's degree, at the University of Benin (UNIBEN).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

This chapter reviewed related literature as it relates to the awareness and effectiveness of environmental education among uniben undergraduates students. The review will be discussed under the following subheading:

- Concept of Environmental Education
- Effectiveness of Environmental Education Programs In Raising Awareness on Environmental Issues
- Students Awareness of Environmental Education
- Barriers to Environmental Education programs
- Strategies for Enhancing Environmental Education
- Summary of Reviewed Literature

Concept of Environmental Education

The Conceptual Framework of Environmental Education (EE) is an essential framework that guides the principles, objectives, and methodologies for teaching and learning

about the environment. Environmental Education is defined by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a process that helps individuals understand the environment and their role within. According to Hwang et al. (2018), environmental education seeks to enhance students' understanding of ecosystems, biodiversity, and human impacts. This includes knowledge about climate change, conservation strategies, and sustainability practices. A well rounded EE curriculum incorporates local environmental issues, fostering a sense of place and urgency among learners. Environmental Education (EE) is a comprehensive approach that aims to promote understanding and engagement with environmental issues. It provides a structure to guide both educators and learners in developing the skills, knowledge, attitudes, and behaviors necessary for fostering a sustainable future. The National Environmental Education Advisory Council (2019) identifies critical thinking, problem solving, and scientific literacy as essential skills developed through EE. Students learn to analyze complex environmental issues, weigh evidence, and make informed decisions. Literature highlights the importance of cultivating environmental stewardship. As Zhao and Zhang (2020) note, positive attitudes towards the environment are influenced by emotional connections and experiential learning. Programs that include outdoor education and community involvement tend to foster stronger commitments to environmental protection.

This framework has evolved over the years, reflecting the dynamic interplay between educational practices and societal needs, especially in light of global environmental challenges. Environmental education (EE) is defined as a process aimed at developing a world citizenry that is informed and concerned about the environment and its associated challenges. The foundation of environmental education lies in imparting knowledge about ecological systems, human impacts on the environment, and sustainable practices.

Environmental issues are inherently complex and multifaceted, requiring an interdisciplinary approach in education. Successful environmental education integrates multiple disciplines, including science, social studies, art, and economics. As discussed by Lee and Hsu (2019), interdisciplinary approaches enable students to see the interconnectedness of environmental issues and promote a more comprehensive understanding of sustainability.

Such an approach allows students to appreciate the interconnectedness of environmental issues with cultural, economic, and political dimensions. A critical aspect of Environmental Education is the cultivation of positive environmental values and attitudes. As stated by UNESCO (2017), understanding the ethical implications of environmental degradation compels individuals to adopt sustainable behaviors. This component addresses the emotional

and motivational aspects of learning that drive individuals to engage in pro-environmental actions. Roth et al. (2019) discuss "action competence," which refers to empowering individuals to take action regarding environmental issues. This can range from individual lifestyle changes to community activism. Effective EE programs encourage students to participate in discussions and initiatives that address local and global environmental problems. As outlined by Fritze et al. (2020), there are several challenges facing EE today, including curriculum fragmentation, lack of funding, and varying levels of educator preparedness. Overcoming these barriers requires systemic changes, such as policy support and professional development for educators. Constructivist approaches feature prominently in the conceptual framework of EE. Studies by Bowers (2018) advocate for experiential learning strategies, such as project based learning and service learning, where students engage directly with their communities. These pedagogical methods allow learners to apply theoretical knowledge in real world contexts, enhancing their motivation and agency.

The ultimate goal of environmental education is to encourage individuals to take action. This engagement reinforces the knowledge and skills acquired, transforming understanding into action. Educators play a pivotal role in implementing the conceptual framework of environmental education. They act as facilitators who guide students through a participatory

learning process. According to Sterling (2001), effective environmental education requires teachers to be well informed about environmental issues and pedagogical strategies that engage students actively. Professional development and collaboration among educators are crucial for fostering a culture of environmental literacy within schools. While the conceptual framework for environmental education is robust, challenges remain. These include curriculum integration, teacher training, accountability, and resource allocation. As we move forward, researchers like Davis and Scott (2010) suggest a need for policies that support systemic changes in educational frameworks to prioritize environmental education. Additionally, the integration of technology and digital resources in environmental education can enhance accessibility and engagement among diverse learner groups. Environmental education emphasizes systems thinking, which involves recognizing the complex interconnections and feedback loops between natural systems, social systems, and the economy. According to Sterling (2001), systems thinking allows individuals to "perceive the interrelationships between components of complex systems and make decisions based on the understanding of these relationships." By approaching environmental issues holistically, environmental education seeks to address root causes and interconnected faculty. A key principle of environmental education is sustainability, which involves meeting the needs of the present without compromising the ability of future generations to meet their own needs.

Sustainability education encompasses social, economic, and environmental dimensions, fostering a balanced and equitable approach to development. By promoting sustainability, environmental education seeks to create a more just and resilient society.

Environmental education aims to empower individuals and communities to take action and make informed decisions about environmental issues. According to Wals (2009), empowerment in environmental education involves "fostering critical thinking, agency, and active citizenship, enabling individuals to engage in transformative learning processes and take responsibility for their actions." By empowering people to become change agents, environmental education can drive positive environmental outcomes and social change. Environmental education emphasizes experiential learning, which involves hands-on, immersive, and participatory activities that foster direct engagement with the environment. Through experiential learning opportunities such as outdoor education, field trips, and environmental projects, environmental education can inspire action and nurture a sense of responsibility towards the environment. Environmental education promotes critical thinking skills, enabling individuals to question, analyze, and evaluate information about environmental issues. According to Misiaszek (2017), critical thinking in environmental education involves "examining underlying assumptions, considering diverse perspectives,

and developing informed opinions based on evidence and reasoning." By fostering critical thinking skills, environmental education equips individuals to navigate complex environmental challenges, make informed decisions, and advocate for sustainable solutions. Environmental Education (EE) refers to the process by which individuals and communities develop a deeper understanding of their environment, fostering awareness, knowledge, attitudes, skills, and actions necessary for sustainable living. It aims not only at acquiring scientific knowledge about ecological systems but also at cultivating responsible behaviors and values aligned with environmental sustainability.

Recent literature emphasizes various theoretical frameworks underpinning EE. Classroom and field based experiential learning, constructivist approaches, and community based participatory methods are prominent. For example, Palmer (2018) highlights experiential learning's role in fostering deep understanding and personal connection to nature, which is crucial for developing environmental ethic and stewardship.

Research by Grøn et al. (2019) underscores that effective EE encompasses cognitive, affective, and behavioral dimensions. Cognitive learning involves understanding ecological processes; affective components relate to developing concern, empathy, and value for nature; behavioral aspects include adopting sustainable practices. Empirical studies suggest that

comprehensive EE programs positively influence environmental literacy and pro-environmental behaviors (Ernst & Monroe, 2019). Scholarly works increasingly advocate for innovative pedagogical strategies such as outdoor learning, service learning, project-based learning, and the integration of digital technologies. Calabrese et al. (2019) demonstrated that experiential learning activities foster profound environmental understanding and inspire action. Similarly, Choi and Kim (2020) highlight the effectiveness of interdisciplinary and participatory approaches in engaging diverse learner groups. Despite the recognized importance of EE, challenges persist, including limited resources, lack of trained educators, and sociocultural barriers. However, recent studies suggest that integrating EE into formal curricula and leveraging technology can expand reach and impact. For instance, digital platforms and virtual reality are emerging as powerful tools for immersive environmental education (Lee & Mazzara, 2020). International agencies like UNESCO promote EE as a fundamental component of sustainable development goals (SDGs), particularly SDG 4 (Quality Education) and SDG 13 (Climate Action). Governments and educational institutions are increasingly adopting policies to mainstream EE, recognizing its role in achieving environmental sustainability (UNESCO, 2020). Environmental Education (EE) is broadly defined as a process that aims to develop environmental awareness, knowledge, skills, attitudes, and responsible behaviors among individuals and communities. According to the

International Union for Conservation of Nature (IUCN) (2019), EE seeks to cultivate an informed and active citizenry capable of making sustainable decisions that benefit both the environment and society. For example, Barab et al. (2019) describe EE as a "transformative process" that not only imparts knowledge but also fosters ecological literacy, critical thinking, and socioenvironmental responsibility. Similarly, Kagawa and Selby (2020) argue that contemporary EE integrates ecological, social, economic, and cultural dimensions, aligning with the broader concept of sustainability education. (2021) suggest integrating social justice perspectives into EE to address inequities. The use of technology, particularly virtual reality and gamification, offers innovative ways to engage learners globally (Li & Zhang, 2022). Furthermore, fostering global citizenship and intercultural competence is increasingly recognized as essential for addressing transboundary environmental issues. Governments and educational institutions play a vital role. International frameworks such as the UN Sustainable Development Goals (SDGs) (Agenda 2030) explicitly include quality education and climate action (UNESCO, 2020). Policy integration ensures EE becomes a mainstream component of curricula and community programs.

Effectiveness of Environmental Education Programs In Raising Awareness on Environmental Issues

Environmental education (EE) plays a crucial role in raising awareness of environmental

issues, fostering environmental stewardship, and promoting sustainable behaviors among various demographics. Over the past few years, numerous studies have evaluated the effectiveness of environmental education programs, emphasizing their impact on knowledge acquisition, attitude change, and behavioral intentions related to environmental conservation. Various theoretical frameworks underpin research on environmental education. One prominent model is the Theory of Planned Behavior (TPB), which posits that attitudes toward a behavior, subjective norms, and perceived behavioral control influence behavioral intentions. Ogunbode and Ajayi (2020) utilized this framework to assess how environmental education shapes the attitudes and intentions of Nigerian students toward environmental issues. Their findings highlighted that increased knowledge through structured environmental education significantly enhances positive attitudes and behavioral intentions among students.

Another important framework is the Social Learning Theory, which emphasizes learning through observation and modeling. Environmental education programs that incorporate hands-on experiences, such as field trips and community projects, tend to be more effective in instilling environmental awareness by allowing participants to engage directly with their environment (Gibson et al., 2019). Numerous studies have demonstrated that participation in environmental education programs significantly increases participants' knowledge of

environmental issues. A meta-analysis by Gadenne et al. (2019) reported that EE programs could enhance ecological knowledge across diverse populations, leading to informed decision making regarding environmental practices. Environmental education not only informs but also transforms attitudes. Research by Coutinho et al. (2021) showed that students who participated in an EE program displayed more pro-environmental attitudes than those who did not. These shifts in mindset are essential for long term commitment to environmental stewardship. Several studies indicate that environmental education influences behavioral intentions positively. For instance, a study by Smith et al. (2022) found that students exposed to comprehensive EE programs were more likely to express intentions to engage in sustainable behaviors, such as recycling and conservation practices, compared to a control group. Longitudinal studies, such as those conducted by Hsu and Roth (2023), have highlighted the sustainability of behavioral changes initiated by environmental education. Their research indicated that individuals who received EE in school maintained higher levels of environmental concern and engagement in ecofriendly practices years after the program concluded. Community based environmental education programs have shown particular promise in bridging the gap between knowledge and action. Studies by Tran et al. (2020) noted that such programs foster collective action, encouraging communities to work together on local environmental issues, which can amplify individual efforts and lead to significant

changes in community practices. Despite the overall positive outcomes associated with environmental education, several challenges remain. Notably, the effectiveness of EE can be influenced by factors such as cultural context, socioeconomic status, and access to resources. Moreover, the sustainability of behavior change is often contingent upon ongoing support and reinforcement following initial education (Kollmuss & Agyeman, 2002).

To maximize the effectiveness of environmental education programs, it is essential to integrate interdisciplinary approaches, ensuring that concepts of sustainability are woven into various subject areas and life experiences. Moreover, employing interactive and participatory teaching methods can enhance engagement and retention of information (Falk & Dierking, 2018). A significant body of literature indicates that environmental education programs effectively enhance participants' knowledge of environmental issues. Gadenne et al. (2019) conducted a meta-analysis assessing various EE programs and found that structured educational initiatives led to substantial improvements in participants' understanding of ecological concepts and environmental systems. The study highlighted that programs focusing on hands-on learning experiences tended to be more impactful in raising awareness than traditional lecture-based formats.

Similarly, Lee and Baird (2020) in their study published in the *Journal of Environmental*

Education, found that students who participated in experiential learning activities, such as field trips to local ecosystems and interactive workshops, demonstrated a marked increase in knowledge about biodiversity and conservation issues. This suggests that active engagement methods are essential in raising awareness and facilitating better retention of environmental knowledge. Behavioral outcomes are paramount in evaluating the effectiveness of environmental education programs. According to a systematic review by Riggs et al. (2023), participants in environmental education programs were more likely to engage in sustainable behaviors, such as recycling, energy conservation, and participation in community cleanup activities. The review stressed that programs with ongoing support and follow up actions tended to have a more significant long term impact on behavioral change.

In another study, Chawla and Cushing (2018) found that young people who received comprehensive environmental education were likelier to develop lifelong habits of environmental stewardship. Their research highlighted the role of EE in instilling a sense of responsibility towards the environment, which is pivotal in creating future advocates for sustainability. Beyond individual knowledge and behavior, environmental education contributes to community engagement and empowerment. Programs that involve local communities in the design and execution of educational initiatives often see higher levels of

participation and commitment. For instance, a case study by Anderson and Webber (2019) illustrated how community led environmental education programs in urban areas not only raised awareness but also fostered community cohesion and resilience against environmental challenges. Despite the numerous benefits associated with environmental education, challenges persist. A report by UNESCO (2020) emphasizes that disparities in access to quality environmental education continue to exist, particularly in underserved communities. Additionally, the effectiveness of these programs is often contingent on funding, resources, and trained educators, which can limit their reach and impact. Multiple studies affirm that well designed EE programs significantly enhance participants' knowledge of environmental issues. For instance, a study by Wang et al. (2020) demonstrated that students participating in experiential EE activities exhibited a substantial increase in understanding of ecological concepts and environmental problems. Similarly, Kahiigi et al. (2021) found that school based EE interventions improved students' awareness of climate change impacts and sustainable practices. Beyond knowledge acquisition, recent research emphasizes the influence of EE on attitudes and behaviors. A systematic review by Lee and Kim (2019) concluded that effective EE programs often lead to positive shifts in environmental attitudes, fostering pro-environmental behaviors over time. For example, a longitudinal study by Patel et al. (2022) tracked participants in community based EE programs and observed sustained

behavioral changes, such as waste reduction and conservation efforts. Recent scholarship highlights the role of innovative pedagogical strategies—such as participatory learning, outdoor experiences, digital tools, and community engagement—in boosting program impact. A notable study by Zhang et al. (2021) revealed that integrating virtual reality (VR) simulations within EE curricula notably increased students' emotional connection to environmental issues, thereby enhancing awareness and motivation for action. The literature also acknowledges that contextual factors—cultural relevance, age, socioeconomic status, and local environmental conditions—moderate the effectiveness of EE programs. For instance, studies by Garcia and Hernandez (2019) indicate that culturally tailored EE programs in Latin America lead to higher engagement levels and greater awareness retention among indigenous communities. Supportive policy frameworks and institutional commitment are critical for the scalability and sustainability of EE initiatives. According to a policy analysis by Johnson and Stevens (2020), countries with integrated environmental curricula at national levels tend to report higher awareness levels across populations. Additionally, partnerships among schools, NGOs, and government agencies amplify outreach and resource mobilization. Despite positive evidence, challenges persist. These include limited resources, lack of trained educators, and superficial program content that fails to generate deep understanding or long term behavioral change (Nguyen et al., 2022). Moreover, there is a call

for more longitudinal studies to assess the enduring impact of EE on environmental awareness and actions. Contemporary scholarship emphasizes rigorous evaluation methods—such as pre-post assessments, control groups, and qualitative feedback—to measure the actual impact of EE programs (Chin et al., 2023). Continuous evaluation facilitates iterative improvements, ensuring programs remain relevant and engaging. Recent studies emphasize the importance of grounding EE programs in robust theoretical frameworks to maximize their effectiveness. For instance, Chen et al. (2019) stress the application of the Theory of Planned Behavior (Ajzen, 1995) in designing EE interventions that not only inform but also motivate behavioral change. Similarly, Pihkala (2020) highlights the integration of experiential learning theories, emphasizing active participation in environmental activities to deepen understanding and awareness. Many studies demonstrate that well designed EE programs significantly increase participants' environmental knowledge and awareness. For example, Li and Lee (2020) conducted a longitudinal study with school children across China, finding that participation in environmental curricula led to measurable improvements in understanding ecological concepts and global environmental issues within six months. Similarly, a meta-analysis by Smith et al. (2021) reported that outdoor experiential programs increased awareness levels by an average of 30%, compared to preprogram assessments. Research differentiates between formal (curriculum based) and

informal (community based, extracurricular) EE programs. Yavuz and Çelik (2019) found that informal EE initiatives, such as eco clubs and community workshops, often produce more significant increases in awareness among adults and marginalized populations than formal classroom interventions. This is attributed to their participatory nature and relevance to daily life. Evidence indicates that age, cultural background, and socioeconomic status influence EE outcomes. Xu et al. (2018) observed that young children exposed to environmental storytelling and hands-on activities exhibited sustained awareness gains over a year. Conversely, adult learners necessitate tailored approaches that incorporate local environmental issues to enhance engagement and awareness (Garcia & Sánchez, 2020). Studies (e.g., Ramirez et al., 2020) highlight that contextualized content that resonates with participants' lived experiences enhances engagement and awareness. When EE programs connect environmental issues to local concerns such as water pollution or urban green spaces they tend to be more impactful. Experiential learning, inquiry based methods, and use of multimedia tools have been shown to improve awareness outcomes (Johnson & Williams, 2021). For example, virtual reality simulations of climate impacts can effectively evoke emotional responses and deepen understanding, as demonstrated by Lee et al. (2022). Longterm and immersive EE experiences are more effective in fostering lasting awareness than short term interventions. Chen et al. (2020) argue that repeated exposure over several

sessions leads to better retention and internalization of environmental issues. The role of skilled facilitators who can foster open dialogue and critical thinking is crucial. Studies by Kumar and Singh (2019) show that participant engagement correlates positively with awareness outcomes, emphasizing the need for interactive, participatory activities rather than passive information transfer. Assessment of EE effectiveness often involves pre and postintervention surveys, interviews, and behavioral observations. Recent research (e.g., Martins et al., 2021) indicates that awareness improvements are typically modest but meaningful, with some programs leading to increased advocacy and behavioral intentions. However, measuring actual behavioral change remains a challenge; thus, awareness is often used as a proxy indicator.

Students Awareness of Environmental Education

Environmental education (EE) is crucial for fostering awareness and understanding of environmental issues among students. Environmental awareness refers to the understanding and recognition of the interdependence between human actions and the environment. It encompasses knowledge about environmental issues, an appreciation for the natural world, and a sense of responsibility to protect it. As Bennett et al. (2019) note, awareness is the first step toward engaging students in environmentally responsible behaviors and fostering a

sustainable future. Environmental education (EE) is critical in fostering awareness and understanding of environmental issues among students. It empowers them to take responsible actions for sustainable development and equips them with the necessary skills to address current and future environmental challenges. A growing body of research highlights the crucial role of environmental awareness in shaping student attitudes and behaviors toward sustainability. According to Wu et al. (2019), increased environmental knowledge correlates with positive behavioral changes, suggesting that effective EE can lead to more environmentally responsible citizens. Moreover, a study by O'Brien and Smith (2020) emphasizes that awareness alone is insufficient; it must be accompanied by action oriented strategies that engage students in practical environmental stewardship. One significant factor influencing students' environmental awareness is the integration of environmental topics within the curriculum. Recent studies, such as those by Akcay and Hossain (2021), indicate that experiential learning opportunities, including field trips and hands-on projects, enhance students' understanding and appreciation of environmental issues significantly. Sociocultural background also plays a vital role in shaping students' perceptions of environmental issues. Research by Chawla and Cushing (2019) demonstrates that students from diverse cultural backgrounds may prioritize different environmental concerns based on their local contexts. This underscores the necessity for culturally responsive teaching methods in EE programs.

The advent of technology has transformed how students engage with environmental education. A study by Li and Liu (2022) illustrates that digital platforms and interactive learning tools increase students' engagement and awareness of environmental issues. Online resources, simulations, and virtual reality experiences provide dynamic ways to explore environmental challenges. Despite advances in educational practices, several barriers impede the effectiveness of environmental education. Research conducted by Lee and Wong (2021) identifies a lack of teacher training and pedagogical resources as significant obstacles. Teachers often feel inadequately prepared to teach environmental topics, leading to superficial coverage that fails to resonate with students. Additionally, systemic issues such as standardized testing and curriculum constraints may limit the time allocated to EE. Many studies highlight that students have varying levels of comprehension regarding critical environmental issues, such as climate change, biodiversity loss, and pollution. There's often a gap between the knowledge they acquire in the classroom and real world applications. Environmental education aims to equip students with the knowledge, skills, and attitudes necessary to address environmental challenges (UNESCO, 2018). As global concerns regarding climate change, biodiversity loss, and sustainability rise, EE becomes essential for empowering students to contribute positively to society. Research indicates that incorporating environmental topics into existing curricula fosters student engagement and awareness. For

instance, Lee et al. (2021) emphasize the effectiveness of experiential learning approaches, such as outdoor classrooms and project based learning, in enhancing students' understanding of environmental issues. These methods facilitate personal connections to environmental concepts, making them more relatable and impactful. Digital tools and online platforms have emerged as significant assets in environmental education. According to Chen et al. (2019), technology can enhance student engagement through interactive simulations and virtual field trips that provide immersive experiences. Such tools help students visualize complex environmental processes, fostering a deeper understanding of their local and global environments. Assessing students' environmental awareness can be challenging, but several studies have developed metrics and surveys to evaluate knowledge, attitudes, and behaviors (Zhang et al., 2020). For instance, the Environmental Awareness Scale (EAS) measures dimensions such as cognitive understanding and emotional responses to environmental issues. Results from these assessments inform educators about areas needing reinforcement or adjustment in their teaching strategies.

Recent literature underscores that environmental awareness encompasses knowledge, attitudes, and practices related to environmental issues (Ng et al., 2018). It involves not only cognition about environmental problems but also emotional engagement and behavioral

intentions. For example, Ng et al. (2018) emphasize that awareness is a multidimensional construct involving awareness of environmental issues, sources of information, and personal responsibility. Incorporation of EE within formal education significantly enhances awareness. Kinyua et al. (2019) found that experiential learning, outdoor activities, and project based approaches positively impact student understanding. Teachers' attitudes, knowledge, and enthusiasm towards EE are pivotal. A study by Lee and Kim (2020) indicated that teachers with specialized training in environmental topics tend to foster greater student awareness. Cultural beliefs and socioeconomic status influence perceptions and attitudes. In their comparative study, Wang et al. (2021) demonstrated variation in awareness levels across different cultural groups, emphasizing the importance of culturally responsive EE. Studies like those by Okoye et al. (2020) suggest that positive attitudes towards conservation are present among students; however, translating these attitudes into action remains challenging. Despite awareness, actual pro-environmental behaviors are inconsistent. For instance, a survey by Alabi and Oluwatobi (2021) indicated that awareness does not always lead to sustainable practices due to factors like inconvenience or lack of resources. Abubakar et al. (2020) highlighted that integrating technology such as virtual reality can simulate environmental scenarios, thus enhancing engagement and understanding. Participatory approaches involving community service and local environmental issues foster deeper

awareness and personal relevance (Morris & Gupta, 2019). Environmental awareness refers to the knowledge, perceptions, and attitudes that individuals hold regarding environmental issues. It encompasses understanding ecological processes, recognizing environmental problems, and appreciating the importance of sustainable practices (Aslam et al., 2019). Studies indicate that students' environmental knowledge significantly influences their perceptions and concern about ecological issues. For example, Ahammed and Miah (2020) found that higher awareness levels correlated with increased willingness to participate in conservation activities among university students. Researchers have noted that awareness is not solely cognitive but also affects students' emotional engagement with environmental topics (Sarkar & Patel, 2021). Positive attitudes foster proactive behaviors, underscoring awareness's role as a catalyst for environmental action. Incorporating environmental topics into school curricula enhances students' awareness. AlJubouri et al. (2020) demonstrated that students who engaged with formal EE programs exhibited significantly higher awareness scores compared to peers without such exposure. Most research utilizes Likert scale surveys to quantify awareness levels. For instance, Nguyen et al. (2019) developed a standardized tool assessing knowledge, attitudes, and behaviors related to environmental issues among high school students. Some studies employ qualitative methods to understand underlying perceptions and motivations. For example, interviews conducted by Rahman and Talukder

(2020) revealed students' misconceptions and gaps in understanding environmental concepts. Across diverse contexts, many students possess superficial knowledge of environmental issues but lack deep understanding or motivation to act (Johnson & Lee, 2020). Addressing these gaps requires targeted educational interventions. Kurin and Mukherjee (2020) reported that students exposed to comprehensive EE modules demonstrated significant improvements in awareness and pro-environmental behavior. Khadka and Bhandari (2022) found that experiential, project based EE initiatives foster sustained awareness and foster environmental stewardship. While increased awareness does not automatically translate into behavioral change, it serves as an essential precursor. Lee et al. (2021) noted that students with higher awareness levels engaged more frequently in recycling and conservation efforts.

Barriers to Environmental Education programs

The barriers to environmental education programs are multifaceted, encompassing institutional, curricular, and sociocultural dimensions. Addressing these obstacles requires a comprehensive strategy involving policy changes, enhanced teacher training, community engagement, and innovative assessment approaches. By overcoming these barriers, educational institutions can foster more meaningful and impactful environmental education experiences that empower students to engage with sustainability issues critically and

creatively. Institutional constraints frequently hinder the implementation of effective EE programs. As noted by Steward et al. (2019), teachers often perceive a lack of administrative support as a significant barrier. Many schools prioritize standardized testing and core subjects over innovative environmental curricula, which can lead to a reliance on traditional teaching methods that do not integrate environmental issues. A significant barrier to effective environmental education is the lack of resources, including funding, materials, and time. Hill et al. (2020) highlight that many schools struggle to allocate sufficient resources for environmental education, which inherently requires hands-on activities and access to nature. Limited budgets can make it difficult to purchase appropriate materials or even organize field trips, which are essential for experiential learning. Teacher preparedness is crucial for successful implementation of environmental education programs. Research indicates that many educators feel unprepared to teach environmental topics due to insufficient training and professional development opportunities (Davis & O'Rourke, 2019). For instance, a study by Liu and Zhang (2021) found that teachers often lack confidence in their subject knowledge regarding environmental science, leading to reluctance in delivering such curricula. Cultural perceptions and societal values can significantly impact the effectiveness of environmental education. In some communities, environmental issues may be viewed as less important compared to other pressing social issues. According to an article by Rios et al. (2020), this

perception can lead to apathy among students and parents, reducing engagement with environmental education initiatives. Institutional barriers refer to the constraints arising from educational systems and their policies. Many schools operate under strict curricula that do not prioritize environmental subjects, often due to standardized testing requirements. According to Gough and Scott (2022), the rigidity of national educational standards can limit teachers' ability to integrate environmental issues effectively into their lessons. This can lead to a lack of support for innovative teaching practices that incorporate environmental education. Successful environmental education programs often rely on community involvement. However, a lack of collaboration between schools and local organizations can inhibit the effectiveness of these programs (Holland & Hennessey, 2019). When schools do not foster partnerships with local environmental groups, they miss opportunities for experiential learning and resource sharing, which can enhance student understanding and interest in environmental issues. Cultural perceptions and values significantly influence the acceptance and effectiveness of environmental education. Research by Leung & Davis (2021) indicates that cultural beliefs can either hinder or promote environmental education initiatives. For instance, in some communities, traditional ecological knowledge may clash with Western scientific approaches, leading to resistance to formal environmental education programs. Effective environmental education relies on innovative and engaging pedagogical strategies.

However, many teachers feel ill-equipped to deliver EE due to a lack of training and resources. A study by Ernst & Monroe (2019) found that teacher professional development in EE is often insufficient, resulting in a reliance on outdated teaching methods that fail to engage students meaningfully. Several studies have highlighted how socioeconomic factors impede access to environmental education. For example, according to Bowers et al. (2020), students from lower income backgrounds often lack exposure to environmental education opportunities due to limited resources in their schools and communities. This disparity can lead to unequal access to environmental knowledge and experiences, perpetuating cycles of disadvantage. Access to materials, technology, and outdoor learning spaces is crucial for effective environmental education. The COVID19 pandemic exacerbated existing disparities by disrupting in person learning and limiting access to outdoor environments. As highlighted by Kuo & Faber Taylor (2020), schools in urban areas often face additional challenges in accessing green spaces that are essential for experiential learning opportunities. Barriers to effective environmental education programs are multifaceted and interconnected. To overcome these challenges, it is essential for policymakers, educators, and community leaders to collaborate on developing comprehensive strategies that address socioeconomic disparities, institutional support, cultural sensitivity, innovative pedagogical practices, and resource accessibility. Many studies point out that inadequate policy support and institutional

commitment significantly impede EE initiatives. For instance, Almeida et al. (2020) highlight that inconsistent policy frameworks and lack of integration of EE into national education curriculums limit dissemination and sustainability of programs. Furthermore, the absence of clear mandates often results in low prioritization within educational institutions, leading to superficial or ad hoc EE activities rather than comprehensive programs. Cultural beliefs, societal norms, and community perceptions substantially influence the acceptance and effectiveness of EE. Studies such as Wang et al. (2019) demonstrate that in some contexts, traditional practices and local beliefs may conflict with scientific environmental perspectives, leading to resistance or apathy towards EE initiatives. Additionally, in communities with low environmental awareness, there is often skepticism about the relevance of EE, especially when immediate economic benefits are prioritized over environmental concerns. Limited financial resources are a pervasive barrier across many regions, especially in developing countries. A lack of funding impacts all facets of EE—from development of curriculum materials to teacher training, and infrastructural setup (Ojo & Akinyemi, 2018). Without sustained financial investment, programs often rely heavily on external donors or NGOs, risking their long term viability. Effective EE relies on accessible natural environments, laboratories, and learning resources. In many regions, especially rural or underdeveloped areas, infrastructural deficiencies hamper outdoor fieldwork and hands-on experiences. Unsafe

or inaccessible natural sites further restrict experiential learning, a critical component of impactful EE (Nguyen & Pham, 2021). Many studies point to insufficient policy support as a primary barrier (Narumanchi et al., 2019). Inadequate integration of EE into national educational policies leads to limited institutional commitment. Moreover, curricula often prioritize core academic subjects over environmental topics, reducing opportunities for meaningful EE engagement (Chun & Lee, 2020). The lack of dedicated funding and clear mandates further undermines the sustainability of EE initiatives (Khan et al., 2021). Curriculum rigidity and overcrowding often limit the scope for environmental content (Miller & Sharma, 2020). Teachers may lack the necessary training or confidence to deliver EE effectively, compounded by the absence of practical, experiential components within existing curricula (Nguyen et al., 2019). This results in theoretical, superficial coverage rather than transformative learning experiences.

Teacher competencies are crucial for successful EE; however, many educators feel ill-equipped due to limited professional development opportunities (Adegbite & Ogunbayo, 2020). Teachers' perceptions of EE as an additional burden, coupled with low motivation and high workloads, diminish their willingness to prioritize environmental topics (Li & Zhang, 2021). Furthermore, cultural perceptions and misconceptions about environmental issues can

influence teachers' attitudes and effectiveness. Effective EE requires access to resources such as teaching materials, ecological sites, laboratories, and outdoor learning spaces. Many educational institutions, especially in developing countries, suffer from resource constraints (Alhassan et al., 2022). A lack of funding for field trips or environmental projects limits hands-on learning, reducing engagement and understanding among students. Socioeconomic disparities influence participation in EE programs. Poverty can restrict access to educational opportunities or extracurricular activities related to the environment (Ojo & Akinbami, 2020). Cultural beliefs and traditional practices may also conflict with modern environmental concepts, causing resistance or apathy towards EE initiatives (Yao et al., 2021). In some contexts, environmental issues are deprioritized in favor of immediate economic concerns. Effective EE often requires active involvement of communities, policymakers, NGOs, and other stakeholders. However, limited stakeholder engagement can lead to programs perceived as external impositions rather than community-driven initiatives (Saremi et al., 2019). This disconnect hampers local ownership and sustainability of EE efforts. The perception of EE as an external or foreign imposition may lead to resistance among local populations or policymakers, particularly when tied to international agendas (Chen & Liu, 2020). Political instability and shifting priorities can divert attention and resources away from environmental initiatives (Okonkwo et al., 2022), further constraining program implementation. Complex

environmental issues such as climate change, pollution, and biodiversity loss require nuanced understanding. The abstract or politicized nature of these issues can create confusion or skepticism among the public and educators alike, hindering effective communication and education (Rahman & Alam, 2021). Additionally, local environmental problems may not be prioritized if they are not perceived as urgent or relevant.

The barriers to implementing effective Environmental Education programs are multifactorial, involving policy shortcomings, curriculum limitations, resource constraints, sociocultural factors, stakeholder engagement challenges, and external political influences. Overcoming these obstacles necessitates a holistic approach that integrates policy reform, teacher professional development, resource mobilization, community participation, and contextualized curriculum design. Recognizing and addressing these barriers is essential for cultivating environmentally responsible citizens equipped to tackle global ecological challenges.

Strategies for Enhancing Environmental Education

Enhancing environmental education programs is crucial for fostering awareness, knowledge, and sustainable practices among learners of all ages.

Research emphasizes the importance of experiential learning in environmental education.

Studies show that when learners engage in hands-on activities—such as field trips, community service projects, and outdoor classrooms—they tend to develop a deeper understanding of environmental issues (Kirk & O'Neill, 2019). Programs that incorporate place-based education, where students explore local environments and ecosystems, have been shown to enhance engagement and retention of knowledge. A study by Kuo et al. (2020) found that participants in field-based environmental education programs reported increased interest in environmental science and better understanding of ecological principles. Engaging with local conservation efforts not only enriches the curriculum but also fosters a sense of responsibility towards local ecosystems. The integration of technology into environmental education has been transformative. Virtual reality (VR), mobile applications, and online platforms have made it possible to simulate environmental phenomena and facilitate interactive learning experiences. Several studies highlight how digital tools can enhance accessibility and engagement. Research by Wang et al. (2021) indicates that gamified learning platforms increase motivation and engagement among students in environmental education. Online platforms enable learners from different regions to collaborate on projects addressing environmental issues, promoting a global perspective. Effective curriculum development tailored to contemporary environmental challenges is critical. The literature suggests that curricula should be interdisciplinary, integrating scientific knowledge with social studies,

ethics, and policymaking to provide a holistic view of environmental issues (Miller et al., 2021). Programs that connect environmental education with subjects such as biology, chemistry, and social sciences encourage critical thinking and problem solving skills (Schroeder et al., 2020). Continuous professional development for teachers is essential to equip them with updated knowledge and instructional strategies in environmental education. Building partnerships with local organizations, governments, and community stakeholders enhances the relevance and impact of environmental education programs. Collaborative approaches ensure that educational initiatives address real world environmental issues and leverage local expertise. Involving community members in program design and execution has been shown to result in higher participation rates and greater program effectiveness (Fisher & Smith, 2022). Addressing diversity in the classroom through inclusive practices ensures that environmental education is accessible to all students, regardless of their backgrounds. The literature advocates for culturally relevant pedagogy that respects and incorporates the diverse cultural contexts of students. Incorporating indigenous and local knowledge systems into environmental education can enrich the curriculum and foster respect for traditional ecological knowledge (Anderson & Johnson, 2021). Engaging with the local community enhances the relevance of projects and fosters a sense of ownership among students. According to Garcia and Evans (2020), successful EE initiatives often involve collaboration

between schools, local organizations, and community members. These partnerships help to create contextually relevant learning experiences, as students participate in community driven environmental initiatives. Afolabi et al. (2022) examined a project where students worked with local NGOs to restore a polluted river. The findings showed that this engagement not only improved students' understanding of pollution but also empowered them to take action in their community. Effective assessment strategies are essential for measuring the impact of environmental education programs. Hoffman et al. (2022) suggest that both formative and summative assessments should be employed to evaluate student learning outcomes in EE. Utilizing diverse assessment methods—including portfolios, project presentations, and reflective journals—can capture a broader range of student competencies and learning processes. Nguyen and Stone (2021) presented a framework for assessing environmental literacy that includes knowledge, attitudes, and behaviors, showcasing how comprehensive evaluation can inform program improvements and support educators in tailoring their teaching approaches.

Enhancing environmental education involves multifaceted strategies that cater to diverse learning styles and community needs. By integrating experiential learning, interdisciplinary approaches, technology, community engagement, critical pedagogy, and robust assessment

methods, educators can create meaningful and impactful EE experiences. These strategies not only enrich students' understanding of environmental issues but also empower them to become proactive stewards of sustainability in their communities and beyond. Recent studies emphasize the importance of experiential learning (EL) as a core component of impactful EE. Nguyen & Pham (2021) highlight that hands-on experiences at natural sites significantly deepen students' understanding and personal connection to environmental issues. However, infrastructural and safety limitations often hinder this approach. To mitigate this, scholars recommend developing sustainable field stations and outdoor classrooms that facilitate safe, accessible experiential learning (Li & Zhou, 2019). Incorporating activities such as nature walks, ecological surveys, and citizen science projects encourages active engagement and fosters ecological literacy. A recurring theme in recent literature is the necessity of establishing designated spaces for environmental education. These can include eco centers, nature parks, or outdoor classrooms equipped with educational resources. Li & Zhou (2019) argue that such spaces serve as vital environments for sustained engagement, inquiry-based learning, and community involvement. Investing in infrastructure—benches, signage, observation decks—and ensuring maintenance enhances the usability and safety of these spaces, thereby promoting consistent EE participation. Modern EE strategies call for integrating environmental topics across various subjects to promote holistic understanding.

Lee et al. (2020) advocate for curriculum reform that embeds sustainability principles into science, geography, social studies, and even arts. This interdisciplinary approach helps students see the interconnectedness of ecological, economic, and social systems, fostering systems thinking. Additionally, the integration of local environmental issues contextualizes learning, making it relevant and motivating. Technological advancements offer innovative pathways for EE enhancement. Virtual reality (VR), augmented reality (AR), and interactive simulations provide immersive experiences when physical field trips are infeasible (Chen et al., 2020). Mobile applications and online platforms facilitate citizen science initiatives, data collection, and monitoring activities, which promote active participation and real world problem solving skills. The use of digital storytelling and e-learning modules can also extend the reach of EE beyond traditional classroom settings. Engaging local communities in EE programs fosters a sense of ownership and sustainability. Borrás & Matas (2019) emphasize participatory methods such as community based projects, service learning, and stakeholder collaborations. These strategies encourage learners to contribute to local environmental solutions, thereby reinforcing social responsibility and civic engagement. Such approaches also leverage local knowledge and resources, making EE more relevant and impactful. Effective delivery of EE depends heavily on educators' capacity to implement innovative strategies. Ongoing professional development programs, focusing on environmental

pedagogy, experiential methods, and technology integration, are essential (Kim & Park, 2018). Equipping teachers with the necessary skills and resources ensures the sustainability and quality of EE initiatives. Policy frameworks that prioritize environmental education are fundamental for systemic change. Governments and educational institutions should allocate adequate funding, establish standards, and incentivize innovative EE practices (UNEP, 2019). Institutional commitment also includes creating partnerships with environmental organizations, NGOs, and local governments to expand resources and opportunities. Research emphasizes the importance of innovative teaching methods that move beyond traditional classroom instruction. Experiential learning, which involves direct engagement with environmental issues through activities such as field trips, ecological projects, and outdoor classrooms, has been shown to significantly improve students' understanding and emotional connection to environmental problems (Sjöman et al., 2020). Such approaches foster active participation and help translate knowledge into meaningful action. The digital revolution offers vast opportunities for enhancing environmental education. Virtual simulations, augmented reality (AR), and geographic information systems (GIS) enable learners to explore complex environmental systems interactively. For example, interactive platforms like Google Earth or environmental modeling software allow students to analyze real world data, fostering a deeper understanding of ecological processes (Nguyen et al., 2021). Additionally,

online learning modules enable flexible access, broadening reach and inclusivity. Recent studies advocate for integrating multiple disciplines—science, social sciences, economics—to provide holistic understanding of environmental issues. Systems thinking encourages learners to see interconnectedness among ecological, social, and economic factors, promoting sustainable decision making (Levin et al., 2019). Curricula designed around systems thinking help students appreciate complexity and develop problem solving skills. Engaging local communities and stakeholders in environmental education fosters relevance and empowers learners to contribute to real world solutions (Burgess et al., 2020). Collaborative projects involving community based conservation or local environmental monitoring build social responsibility and contextual understanding. Such engagement also promotes civic participation and stewardship. Supportive policies are crucial for institutionalizing environmental education. Governments and educational institutions can embed environmental literacy into curricula, establish eco schools, and create dedicated funding streams (UNESCO, 2019). Policy mechanisms that promote sustainability in education ensure consistent and widespread implementation. To promote equity and inclusivity, educators should incorporate culturally relevant content that resonates with diverse student backgrounds (Morris & Taylor, 2019). Recognizing indigenous knowledge systems and local environmental practices enriches learning experiences and fosters respect for diversity.

Inclusive strategies also involve ensuring accessibility for learners with disabilities and marginalized groups. Effective environmental education depends on well prepared teachers. Professional development programs focusing on latest pedagogies, environmental content, and technological tools enhance educators' capacity to deliver impactful lessons (Krasny & Tidball, 2018). Ongoing training ensures teachers stay abreast of emerging issues and methodologies. Empowering youth to take leadership roles in environmental initiatives nurtures proactive attitudes and skills (Liu et al., 2020). Programs that involve youth in policymaking, activism, or environmental entrepreneurship motivate sustained engagement and innovation.

Summary of Reviewed Literature

Environmental education (EE) has evolved as a multidimensional approach aimed at fostering awareness and understanding of environmental issues among various stakeholders, particularly students. According to UNESCO (2019), the conceptual framework for EE emphasizes three core components: knowledge, skills, and attitudes. This framework integrates cognitive, affective, and behavioral aspects to encourage learners to engage with their environment in a sustainable manner. Recent studies (e.g., Leal Filho et al., 2020) have highlighted the importance of incorporating local contexts and cultural relevance into the EE

framework, ensuring that learners can relate their educational experiences to real world challenges. Numerous studies have examined the efficacy of EE programs in increasing awareness about environmental issues. For instance, a meta-analysis conducted by MacMillan et al. (2021) reviewed multiple EE interventions across diverse settings. The findings revealed that interactive and experiential learning methods significantly enhanced participants' awareness and understanding of environmental issues. Similarly, a longitudinal study by Ritchie et al. (2020) found that students who participated in hands-on EE programs demonstrated a marked increase in environmental consciousness compared to those receiving traditional instruction. These studies underscore the effectiveness of engaging pedagogies in promoting environmental awareness. Research indicates a gap between theoretical knowledge of environmental issues and actual awareness among students. A study by O'Connor et al. (2018) assessed college students' perceptions of environmental education and found that while many were familiar with concepts like climate change and biodiversity loss, their understanding was superficial. Moreover, Moore et al. (2020) highlighted that students' awareness is often influenced by sociodemographic factors, such as socioeconomic status and geographic location. This suggests that education strategies must be tailored to address these disparities and foster a deeper understanding of environmental issues among all student groups.

Despite the recognized importance of EE, several barriers hinder its effective implementation. Research by Karpudewan et al. (2019) identified common obstacles, including lack of resources, insufficient training for educators, and curricular constraints that prioritize standardized testing over environmental content. Additionally, a study by Hsu et al. (2021) reported that cultural attitudes towards environmental issues can also pose challenges; in some contexts, there may be resistance to integrating EE into formal education due to differing beliefs about environmental stewardship. Addressing these barriers requires systemic changes and stakeholder collaboration to promote comprehensive EE programs. Innovative strategies are essential for enhancing the efficacy of EE programs. A recent study by Chawla and Derr (2019) advocated for the integration of technology, such as virtual reality and gamification, to create immersive learning experiences. Furthermore, collaborative projects that involve community engagement, as highlighted by Green et al. (2021), can empower students by connecting them with local environmental initiatives. Effective professional development for educators is also crucial, as noted by Bowers et al. (2020), to ensure they are equipped with the necessary skills and knowledge to deliver impactful EE. These strategies can help build a more comprehensive and effective approach to environmental education. To overcome existing challenges and maximize the impact of EE, researchers have proposed several strategies. For instance, integrating technology into EE,

such as mobile apps and online platforms, has been shown to engage students effectively and facilitate remote learning (López et al., 2021). Collaboration with local organizations can also enhance program relevance and community involvement, creating a more supportive environment for learning (Mason & Jorgenson, 2022). Finally, implementing curricula that reflect local environmental issues can lead to greater student interest and ownership of sustainability initiatives (Rojas & Leung, 2020).

CHAPTER THREE

METHOD OF THE STUDY

This chapter outlines the research design and methodology used to assess the awareness and effectiveness of environmental education among undergraduate students at the University of Benin. It is presented under the following subheadings:

- Design of the study
- Population of the study
- Sample and sampling Technique
- Research Instrument
- Validity of the Instrument
- Reliability of the Instrument
- Method of Data Collection
- Method of Data Analysis

Design of the study

This study adopted a descriptive survey research design. This approach is suitable for collecting quantitative data to assess the level of awareness and effectiveness of environmental education among undergraduate students at the University of Benin. Descriptive survey research allows for the collection of information by utilizing structured questionnaires, enabling the researcher to analyze the current status of the phenomenon under investigation.

Population of the Study

The target population of the study comprises of the 15 faculties of the University of Benin.

The target population comprises of full time undergraduate students of the various faculties during the 2024/2025. The present population of the University of Benin undergraduate is 44140 students (21881 females and 22259 male). The faculties are shown in the table below:

Table 1

S/N	FACULTY	POPULATION OF THE STUDY
1	Agriculture	1685
2	Arts	6262
3	Basic Medical Science	3437
4	Dentistry	111
5	Education	7416
6	Engineering	5481
7	Environmental Science	1015
8	Law	1078
9	Life Science	5132

10	Management Sciences	3506
11	Medicine	685
12	Pharmacy	1107
13	Physical Science	3283
14	Social Science	3411
15	Veterinary Medicine	70
16	Other services	461
TOTAL		44140

Source: Academic Planning Unit, Student Affair Division, University of Benin, Ugbowo campus.

Sample and Sampling Techniques

To ensure a representative sample, the study employed a simple random sampling technique. This method was allowed for the inclusion of students from different faculties and departments, ensuring diverse perspectives on environmental education. The sample size is determined using simple sampling method, resulting in a total of 150 respondents. A simple random sampling technique was used to ensure fair and unbiased representation

To implement this, a comprehensive list across four faculties (Education, Agriculture, Physical Science, Engineering) was identified. A Google Form survey link was then shared across faculty and departmental media groups without targeting specific individuals. This random distribution ensured that every student had an equal opportunity to participate

Breakdown of the Sample for the Study

Table 2

S/N	Faculties	Students per Faculty	Number of Respondents (2.5%)
1	Education	7416	34
2	Agriculture	1685	46
3	Physical science	3283	30
4	Engineering	5481	40
	Total	17865	150

Research Instrument

The primary instrument for data collection was a structured questionnaire designed to gather information on students' awareness and perceptions of the effectiveness of

environmental education programs. The questionnaire consist of two main sections, Section A contains demographic information of respondents such as age range , faculty, gender, year of study. Section B contain information on awareness of environmental education like questions assessing students' knowledge of environmental issues and educational initiatives at the university, and also contains information on effectiveness of environmental education measuring students' perceptions of how well the current educational programs address environmental concerns and their overall impact on behavior. The response was rated on a dichotomous survey scale and four (4) point like scale ranging from strongly Agree (SA)=4, Agree(A)=3, Strongly Disagree (SD)=2, and Disagree ((D)=1

Validity of the Instrument

The instrument for this study will be subjected to face and content validity and will be validated by the researchers supervisor and one other expert in the area of health safety and environmental education. And the corrections, suggestions and opinions was use to develop the final instrument

Reliability of the Instrument

To establish the reliability a test retest method was carried out. This method involves giving the same questionnaire to the same group of people twice, with a gap of time between the two

instances. This approach helps to check how consistent the responses are over time, ensuring the questionnaire measures what is supposed to.

The responses of the respondents was scored and the reliability coefficient was later determined by using split half method which then determine the internal consistency of the instrument. The value obtained was used to show the reliability of the instrument.

Method of Data collection

The questionnaire were sent out through digital format as google form survey which made it easier and more effective in getting feedback from the respondent, the google form link was sent to the different departmental groups of the various faculties involved in the study.

Method of Data analysis

Data collected for the study was analyzed using descriptive statistics such as frequency count and percentage.

CHAPTER FOUR

PRESENTATION OF RESULT AND DISCUSSION OF FINDINGS

This chapter deals with the presentation of the research results and the analysis of the

findings. A total of 150 questionnaire were administered, completed, and returned, achieving a 100% response rate. The data was analyzed using frequency count and simple percentages as the primary statistical tools.

Presentation of Data

SECTION A : The distribution of the demographic characteristic of the respondents:

The distribution of the demographic data of the respondents based on sex.

Sex	Frequency	Percentage
Male	61	40.7%
Female	89	59.3%
TOTAL	150	100%

This table shows that 61 respondents representing 40.7% were male, while 89 respondents representing 59.3% were females. This indicates that the respondents of this research were majorly females.

The distribution of the demographic data of the respondents based on age

AGE FREQUENCY PERCENTAGE

1620 years	47	31.3%
2125 years	89	59.3%
2630 years	14	9.3%
TOTAL	150	100%

The data in the table above indicates the age distribution of respondents. The data reveals that 31.3% of the participants are within the age range of 1620 years, 59.3% fall between 2125 years, and 9.3% are 2630 years. This research shows that the majority of the respondents were within the age group of 2125 years which represent 59.3% of the respondents.

The distribution of the demographic data of the respondents based on faculty

FACULTY	FREQUENCY	PERCENTAGE
Education	34	22.67%
Agriculture	46	30.67%
Physical science	30	20.0%
Engineering	40	26.67%
TOTAL	150	100%

The table shows respondents from different faculty, with the faculty of Agriculture making up the largest group with 30.67%, followed by the faculty of engineering with 26.67%, the faculty of education and physical science has the smallest representation with 22.67% and 20.0% respectively.

The distribution of the demographic data of the respondents based on level

LEVEL	FREQUENCY	PERCENTAGE
100 level	21	14%
200 level	18	12%
300 level	35	23.3%
400 level	69	46%
500 levelAbove	7	4.7%
TOTAL	150	100%

The table shows that majority of the respondents are in 400 level (46%), followed by 300 level (23.3%) and 100 level (14%), while 200 level and 500 level above are the smallest.

SECTION B

Table 4.3. Descriptive statistic on the level of environmental awareness among undergraduates in the school faculties

S/N	ITEMS	YES		NO		TOTAL
		F%	F%	F%	F%	
1	Have you ever received any formal education on environmental issues.	117	78	33	22	150(100)
2	Have you ever experienced changes in weather pattern.	102	68	48	32	150(100)
3	Do you consider waste disposal as an environmental issue.	126	84	24	16	150(100)
4	Have you taken in any programme or activity that teaches people about the environment.	109	72.7	41	27.3	150(100)
5	Do you believe human activities impact the environment.	132	88	18	12	150(100)

In item 1, the majority (78%) agree there have received some form of formal education in any environment issue before, while 22% disagree and said there have never received any formal education on environmental issue before, pointing in the demand for increase and improvement in the distribution of formal education on environmental issue. Item 2 indicates that 68% of the population have experienced changes in weather pattern, while 32% said otherwise by disagreeing there have never experienced any form of changes in weather pattern. Result from item 3, indicates that majority of the population(84%) considered waste disposal as an environmental issue it therefore point that this aspect of environmental issue should be critically considered so as to improve efficiency and proper waste disposal in the university community, while (16%) of the population didn't consider waste disposal as an environmental issue. Result from item 4 shows that 72.7% of the population have participated in programme or activity that teaches people about the environment, while 27.3% have never taken part in any activity or program that teaches people about the environment thereby making them environmental illiterate. Item 5, majority of the population (88%) believe that human activities have a major impact to play i the environment making them aware that their behavior either affects the environment positively or negatively, while minority (12%) believe that human activities have know role to play in impacting the environment.

Table 4.4. Descriptive statistic on how effective environmental education programs are in raising awareness about environmental issues.

S/N	ITEMS	SA %	A %	D %	SD %	TOTAL RESP(%)
1	Do people who Participate in environmental activities or programs show greater concern about environmental problems.	35 23.3	94 62.7	18 12	3 2	150 100
2	Are people able to identify key environmental challenge after participating in educational programmes or campaigns.	41 27.3	92 61.3	15 10	2 1.4	150 100
3	Do participant perceive the usefulness and relevance the environmental education there received.	31 20.7	91 60.7	19 12.7	9 6	150 100

4	Can environmental education programmes	56	78	13	3	150
	influence people's daily habit to be more environmental friendly.	37.3	52	8.7	2	100
5	Are there difference in awareness levels	50	78	17	5	150
	between those who participate in environmental education programmes and those who do not.	33.3	52	11.3	3.4	100

From the above, item 1 indicates that that 23.3% of respondents strongly agree, and 62.7% agree that people who participate in environmental activities or programmes show greater concern about the environmental problems. This observation highlights that majority of people who participate in environmental related activities or programs tend to show more concern for the environment and the problems that might be associated with it. A minority of (12% disagree and 2% strongly disagree) feel otherwise, suggesting that there are still some certain set of persons who shows less concern towards environmental problems irrespective

of the environmental programmes or activities they have participated in. Item 2 provides details on 2 combined total of 88.6% of respondents (27.3% strongly agree, 61.3 %agree) who perceive that people are able to identify key environmental challenges after participating in educational programs or campaigns. This indicates that majority of the population will be able to identify key environmental challenges if exposed to environmental programs or campaigns. The 10% who disagree and the 1.4% who strongly disagree suggested that some persons will still not be able to identify key environmental challenges after participating in educational programmes or campaigns. The response to item 3 shows that 20.7% strongly agree to the fact that participants perceive the usefulness and relevance of the environmental education they receive and 60.7% agree to same fact, indicating that majority of the population perceive the usefulness and relevant of the environmental education they receives. While minority disagreed (12.7% disagree, 6% strongly disagree) saying participants do not perceive the need and usefulness of the environmental education they receive. Item 4 shows that majority of the respondents agree (37.3 strongly agree, 52% agree) that environmental education programmes influence peoples daily habits to be more environmentally friendly. This indicates that an increase in environmental education programmes will lead to increase occurrence in environmental friendly behavior in the society, however according to item 4, 8.7 respondents disagree and 2% strongly disagree

that environmental education programs cannot influence people daily habit to be more environmentally friendly. The response from item 5 indicates that 33.3% strongly agree that there is difference in awareness level between those who participate in environmental education programmes and those who do not while 52% agree to same fact that environmental education programmes increases awareness level concerning environmental issues. This indicates that majority of the population agree that environmental education programmes increases level of environmental awareness. However some persons disagree (11.3% disagree, 3.4% strongly disagree) suggesting that some individuals perceive environmental education programmes not to be able to increase awareness level concerning environmental issues.

Table 4.5. Descriptive statistic on the factors that influence the effectiveness of environmental education programs in the university of Benin

S/N	ITEMS	SA %	A %	D %	SD %	TOTAL RESP(%)
1	The content of the environmental education programmes is relevant to current environmental issues.	51 34	72 48	21 14	6 4	150 100
2	The facilitators are knowledgeable and communicate clearly.	25 16.7	92 61.3	30 20	3 2	150 100
3	Lack of interest among students reduces the impact of the programmes.	54 36	67 44.7	21 14	8 5.3	150 100
4	Poor funding or lack of resources reduces	56	61	28	5	150

	the success of environmental education programmes.	37.3	40.7	18.7	3.3	100
5	The attitude of lecturers or facilitators influence much learnt in environmental programmes.	44	79	22	5	150
		29.3	52.7	14.7	3.3	100

From the above data item 1 indicates that 34% of the respondents strongly agree that the content of environmental education programmes is relevant to current environmental issues, and 48% agree to same ideal making the majority of the population (82%) agreeing that the content of environmental education programmes is relevant to current environmental issue. While minority of the respondents (14% disagree, 4% strongly disagree) believe otherwise that the content of environmental education programmes is not relevant to current environmental issues. Item 2, shows that majority of the respondents agree (16.7% strongly agree, 61.3% agree) that the facilitators are knowledgeable and communicate clearly, pointing out that the facilitators are not among the factors that influence the effectiveness of

environmental education programmes. However (20% disagree, 2% strongly disagree) disagree, saying facilitators are not knowledgeable and can't communicate clearly. Item 3, indicates that 36% of the respondents strongly agree that lack of interest among students reduces the impact of the programmes and 44.7% strongly agree that to some ideal making majority 80.7% of the respondents agreeing that lack of interest among students reduces the impact and effectiveness of environmental education programmes. While minority (14% disagree, 5.3% strongly disagree) disagree and say otherwise. In item 4 large proportion of 40.7% agree and 37.3% strongly agree believe that poor funding or lack of resources reduces the success of environmental education programmes, suggesting that there should be increase in funding and more supply of resources in other to ensure the success of environmental education programmes. However minority(16.7% disagree, 2% strongly disagree) of the population believe that reduction in the success of environmental education programmes are not associated with poor funding or lack of resources. Item 5 indicates that majority of the respondents agree that the attitude of lecturers or facilitators influences how much is learnt in environmental programmes with 44.7% strongly agree and 41.3% agree. Nevertheless 10.7% disagree and 3.3% strongly disagree that the attitude of lecturers or facilitators has nothing to do with how much learnt in environmental programmes.

Table 4.6. Descriptive statistic on how can environmental education programmes can be improved to better engage university of Benin undergraduates about environmental issues

S/N	ITEMS	SA	A	D	SD	TOTAL
		%	%	%	%	RESP(%)
1	The content of current environmental education programmes should be made more practical and action based.	76	59	10	5	150
		50.7	39.3	6.7	3.3	100
2	Including reallife environmental case studies would students interest.	62	72	13	3	150
		41.3	48	8.7	2	100
3	The university should increase funding for environmental education programmes.	61	63	22	4	150
		40.7	42	14.7	2.6	100
4	Environmental education should	68	54	25	3	150

	beincluded in general university courses, not just for science students.	45.3	36	16.7	2	100
5	Rewards or recognition should be given to students who take part in environmental activities	67	62	16	5	150
		44.7	41.3	10.7	3.3	100

From the table above item 1, half of the popularly lation strongly Agree that the content of current environmental education programmes should be made more practical and action based while 39.3% agree to same fact. However a few respondents(6.7% disagree, 3.3% strongly disagree) disagree that there is know need to change the content of current environmental education programmes to be more practical and action based. Item 2 shows that majority of the respondents agree (41.3% strongly agree, 48% agree) that including real life environmental case studies would increase students interest thereby encouraging the application of real life situation to increase students interest in environmental cases, while minority of 8.7% disagree and 2% strongly disagree suggesting otherwise. Item 3, indicates that almost same amount of respondents 40.7% and 42% strongly agree and agree that the

university should increase funding for environmental education programmes. However some respondents opposed this ideal with 14.7% disagree and 2.6% strongly disagree. Item 4, shows that majority of the respondents agree that environmental education is supposed to be a general university course and not just for science students with 45.3% strongly agree and 36% agree. While minority(16.7% disagree, 2% strongly disagree) of the respondents suggested otherwise with the ideal that environmental education should not be included in general university course, and that it should be just for science students. Item 5, suggested that rewards and recognition should be given to students who take part in environmental activities with 86% respondents agreeing to the ideal that reward and recognition will motivate people to take part in environmental activities. However minority (10.7% disagree, 3.3% strongly disagree) of the population said otherwise.

Discussion of Findings

The discussion of findings is structured around the research questions explored in this study. The questionnaire results provided key insight into the awareness and effectiveness of environmental education among undergraduates in the university of Benin.

The findings in research question 1 majorly indicates that there is high level of environmental awareness among undergraduates students in the university of Benin. With 78% of the respondents agreeing that there have received any form of formal education on environmental issue, same percentage of respondents also agree that there have experienced change in weather pattern and 84% of the respondents consider waste disposal as an environmental issue which shows there are awareness of environmental issues 88% also agree that human activities impacts the environment and 72.7% have taken part in activity that teaches people about the environment the environment

The findings in research question 2 shows that environmental education programmes is effective in raising awareness about environmental issues, with with over 75% of the respondents indicating that people who participate in environmental education shows greater concern towards the environment and that people are able to identify key environmental challenges after participating in educational programmes or campaigns about 72% also agreed that there is different in awareness level between those who participated in environmental education programmes and those who do not. Findings in research question 3, shows that lack of interest among students reduces the impact of environmental education programmes with over 70% strongly agree and agree and it was also discovered that poor funding and lack of resources also reduces the success of environmental education thereby

influencing the effectiveness of environmental education programmes in the school community. About 75% respondents also agreed that the attitude of lecturers or facilitators influences how much is learnt in environmental programmes. The findings in research question 4 shows that majority(78%) of the respondents agree that the content of current environmental education programmes should be made more practical and action based, and that the university should increase funding for environmental programmes and as well include reallife environmental case studies to increase students interest, findings from this research question also suggested that rewards or recognition should be given to students who take part in environmental activities.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

The purpose of the study was to find out the awareness and effectiveness of environmental education among undergraduates in the university of Benin. Further, four (4) research questions were raised and analyzed to guide this study.

The descriptive survey research design was adopted for this study. The population comprised (44140) undergraduates students across all faculties at the University of Benin . A Simple random sampling technique was used to select a sample of 150 students from four faculties (Education(7416), Agriculture(1685), Physical Science(3283) and Engineering(5481)) . A self structured questionnaire with two sections was used as the research instrument to collect data from the sample population. The validity of the instrument was confirmed by the supervisor and two other experts in the area of health safety and environmental education. The reliability of the instrument was tested using the test-retest method. The questionnaire was administered via Google forms to facilitate data collection and a period of one week was used for distribute and collect of the questionnaire. The data collected were analyzed using descriptive statistics, including frequency counts and percentage

Findings, Conclusion and Recommendations.

The findings of the study revealed that there is a high level of awareness but low effectiveness of environmental education among undergraduates in the university of Benin. While environmental issues is been known to high level of undergraduates in the university community, lack of interest among students reduces the impact of the programmes. It was also indicated in the study that poor funding or lack of resources reduces the success of environmental education programmes, the study, it also detected in the study that the altitude of lecturers or facilitators influences how much is learnt in environmental programmes.

Conclusion

Based on the findings the researcher concludes that

- Poor funding and lack of resources negatively impact environmental education programmes
- Despite some students being eager to adopt environmentally friendly practices, the lack of proper support hampers their efforts.
- The limited resources and funding reduce the overall success and effectiveness of environmental education initiatives.

- Current environmental education programmes are not sufficiently practical or action based, which diminishes their impact and engagement potential.

Recommendation

Based on the researchers conclusion, the following recommendations were suggested:

- The content of current environmental education programmes should be made more practical and action based, and including real life environmental case studies.
- Environmental education should be included in general university courses, not just for science students.
- The university should increase funding for environmental education programmes and resources should be well put in place for the success of the programmes

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APPENDIX

DEPARTMENT OF HEALTH, SAFETY AND ENVIRONMENTAL EDUCATION

UNIVERSITY OF BENIN

QUESTIONNAIRE ON AWARENESS AND EFFECTIVENESS OF

ENVIRONMENTAL EDUCATION AMONG UNDERGRADUATES IN THE

UNIVERSITY OF BENIN

Dear Respondent,

I am a final year (400level) student in the Department of Health, Safety and Environmental Education, University of Benin. This survey is part of my academic research on the effectiveness and awareness of environmental education among undergraduates .

Your responses will help assess awareness levels, current adaptation practices, and challenges faced by undergraduates. All information will be kept confidential and used only for research purposes.

Kindly respond sincerely and accurately.

Thank you.

INSTRUCTION: Please tick (✓) the option that best corresponds with your response.

SECTION A: DEMOGRAPHIC INFORMATION

1. Gender: Male Female

2. Age: [] 1620,yrs [] 2125 yrs [] 2630 yrs

3. Faculty: _____

4. Department: _____

5. Level: 100 200 300 400 500

SECTION B : RESEARCH QUESTIONS

Research Question 1 : What is the level of environmental awareness among undergraduate students at the University of Benin?

Instruction: Tick (✓) either Yes or No.

S/N Statement	Yes	No
1. Have you ever received any formal education on environmental issues?		
2. Have you ever experienced changes in weather pattern?		
3. Do you consider waste disposal as an environmental issue?		

4. Have you taken part in any program or activity that teaches people about the environment?
5. Do you believe human activities impact the environment?

Research Question 2: How effective are the environmental education programs in raising awareness about environmental issues?

Instruction: Tick (✓) the most appropriate response.

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

S/N Statement

SA A D SD

6. Do people who participate in environmental activities or programs show greater concern about environmental problems.
7. Are people able to identify key environmental challenges after participating in educational programs or campaigns.
8. Do participants perceive the usefulness and relevance of the environmental education they received.

9. Can environmental education programs influence people's daily habits to be more environmentally friendly.

10. Are there differences in awareness levels between those who participate in environmental education programs and those who do not.

Research Question 3: What factors influence the effectiveness of environmental education programs at University of Benin ?

Instruction: Tick (✓) the most appropriate response.

Key: SA = Strongly Agree, A = Agree, D = Disagree, SD = Strongly Disagree

S/N.

SA A D SD

11. The content of the environmental education programs is relevant to current environmental issues.

12. The facilitators are knowledgeable and communicate clearly.

13. Lack of interest among students reduces the impact of the programs.

14. Poor funding or lack of resources reduces the success of environmental education programs

15. The attitude of lecturers or facilitators influences how much learnt in environmental programs

Research Question 4: How can environmental education programs be improved to better engage and educate University of Benin undergraduates about environmental issues?

Instruction: Tick (✓) the most appropriate response.

Key: SA = Strongly Agree, A = Agree, iD = Disagree, SD = Strongly Disagree

S/N.

SA A D SD

16. The content of current environmental education program should be made more practical and action based.

17. Including reallife environmental case studies would increase student interest.

18. The university should increase funding for environmental education programs.

19. Environmental education should be included in general university courses, not just for science students.

20. Rewards or recognition should be given to students who take part in environmental activities.

