

# Impact of Nature-Based Experiences on Children's Cognitive Development and Environmental Awareness from Caregivers' Perception in Lagos State Early Childhood Education Care Centres

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## Abstract

*This study investigated on the impact of nature-based experiences on children's cognitive development and environmental awareness from caregivers' perception in early childhood education care centers in Lagos State. To achieve this purpose, a descriptive survey design was employed, with data collected from 75 caregivers randomly selected from 25 public preschools in 5 purposively selected Local Government Areas. A self-designed questionnaire, titled "Nature-based Experiences, Children's Cognitive Development, and Environmental Awareness Questionnaire (NECCDEAQ)," was developed and demonstrated high reliability with a Cronbach's Alpha score of 0.89. Findings revealed that nature-based experiences, such as outdoor play, gardening, and exploring natural environments, significantly contribute to children's cognitive development in early childhood education care centers in Lagos State. Caregivers perceived these activities as beneficial for enhancing children's environmental awareness. Specific nature-based activities considered most beneficial included gardening and exploring natural environments. Furthermore, caregivers expressed support for incorporating nature-based experiences into the curriculum of early childhood education care centers. Factors influencing caregiver support included the educational benefits of nature-based activities and their positive impact on children's well-being. Overall, the findings concluded that nature-based experiences play a crucial role in promoting children's cognitive development and environmental awareness in early childhood education settings in Lagos State. Caregivers reported a positive correlation between these experiences and children's learning outcomes. The study recommended that nature-based activities should be integrated into daily routines and curriculum, promoting environmental stewardship. The study also recommended the need for provision of training for caregivers to effectively implement these practices.*

**Keywords:** Nature-Based Experiences, Children, Cognitive Development, Environmental Awareness and Caregivers

## Introduction

Early childhood education plays a crucial role in shaping a child's cognitive development and environmental awareness. Cognitive development, as defined by Piaget (1952), involves the growth of mental processes such as perception, memory, language, problem-solving, and reasoning. Environmental awareness, on the other hand, encompasses an individual's understanding of the natural world and their role in preserving it (Chawla, 2016).

In recent years, there has been growing interest in the potential benefits of nature-based experiences for young children. Nature-based experiences refer to activities and learning opportunities that occur in natural outdoor environments, allowing children to interact directly with nature (Louv, 2015). These experiences can include outdoor play, gardening, nature walks, and exploration of local ecosystems. Nature-based experiences have been shown to offer numerous benefits for children's overall development. Research suggests that exposure to nature can enhance cognitive functioning, improve attention span, reduce stress, and promote physical activity (Taylor & Kuo, 2019; Wells, 2020). Additionally, nature-based experiences have been linked to increased environmental awareness and pro-environmental behaviours in children (Cheng & Monroe, 2022).

Proponents of nature-based experiences argue that they provide a rich, multisensory learning environment that stimulates children's curiosity and imagination. Kellert (2005) suggests that direct contact with nature is

essential for children's cognitive, emotional, and moral development. Studies have shown that nature-based experiences can improve children's attention, working memory, and problem-solving skills (Dadvand *et al.*, 2015; Schutte *et al.*, 2017). Furthermore, nature-based experiences have been associated with increased environmental stewardship and conservation attitudes in children. Wells and Lekies (2016) found that childhood experiences in nature were positively correlated with pro-environmental attitudes and behaviours in adulthood. This suggests that early exposure to nature can have long-lasting effects on environmental awareness and concern.

Critics of nature-based experiences in early childhood education argue that they may pose safety risks and logistical challenges. Some researchers have raised concerns about potential hazards such as insect bites, allergic reactions, and exposure to harmful plants or animals (Little & Wyver, 2018). Additionally, there are concerns about the feasibility of implementing nature-based programs in urban areas with limited access to natural spaces (Ernst, 2014). Another argument against nature-based experiences is the potential for reduced focus on academic skills traditionally emphasized in early childhood education. Some educators and policymakers worry that time spent outdoors may come at the expense of structured learning activities aimed at developing literacy and numeracy skills (Maynard *et al.*, 2023).

Despite these concerns, the potential benefits of nature-based experiences for cognitive development and environmental awareness are compelling. Research has shown that nature-based learning can enhance executive functioning skills, which are crucial for academic success and overall cognitive development (Bourrier *et al.*, 2018). These skills include attention, working memory, and cognitive flexibility, all of which are essential for problem-solving and critical thinking.

Moreover, nature-based experiences provide opportunities for children to develop a sense of connection with the natural world, fostering environmental awareness from an early age. Chawla (2017) argues that direct experiences in nature during childhood are crucial for developing environmental sensitivity and a lifelong commitment to environmental stewardship. Several empirical studies have explored the impact of nature-based experiences on children's cognitive development and environmental awareness. For example, a study by Ulset *et al.* (2017) found that outdoor time in preschool was positively associated with children's cognitive and behavioral development. The researchers observed improvements in attention and reduced hyperactivity symptoms among children who spent more time outdoors.

In another study, Collado *et al.* (2023) investigated the effects of a nature education program on children's environmental attitudes and behaviors. The results showed that participation in the programme led to increased environmental awareness and pro-environmental behaviours among the children. A longitudinal study by McCree *et al.* (2018) examined the impact of forest school experiences on children's development over three years. The findings revealed improvements in children's confidence, social skills, language and communication, motivation and concentration, and physical skills.

The absence of nature-based experiences in early childhood education may have several negative consequences. Louv (2015) coined the term "nature-deficit disorder" to describe the potential developmental and health issues that can arise from a lack of connection with nature. These issues include attention difficulties, higher rates of physical and emotional illnesses, and a diminished use of the senses. Furthermore, limited exposure to nature may result in reduced environmental awareness and concern among children. This could lead to a generation less equipped to address pressing environmental challenges and less likely to engage in pro-environmental behaviors (Chawla, 2016).

The lack of nature-based experiences may also deprive children of important opportunities for physical activity, sensory stimulation, and social interaction. These elements are crucial for holistic development and may be more difficult to replicate in indoor, structured learning environments (Fjørtoft, 2021). Given the potential benefits of nature-based experiences and the risks associated with their absence, it is crucial to investigate their impact on children's cognitive development and environmental awareness. This study therefore seeks to investigate the impact of nature-based experiences on children's cognitive development and environmental awareness from caregivers' perception in Lagos State early childhood education care centres.

### Statement of the Problem

Early childhood is a critical period for cognitive development and environmental awareness. While research suggests potential benefits of nature-based experiences (outdoor play, gardening, exploring natural

environments) for children's cognitive skills and environmental connection (Fjørtoft, 2019; Wells & Evans, 2023), limited research has explored these experiences within the context of Early Childhood Education and Care (ECEC) centers in Lagos State, Nigeria. Urbanization in Lagos has led to a decrease in green spaces and limited opportunities for children to connect with nature. Additionally, the curriculum in many ECEC centers may not prioritize nature-based activities (Akinbile & Alabi, 2022).

This research focuses on the explored area of caregiver perceptions in Lagos. While some studies have explored the benefits of nature-based experiences for children (Fägerström *et. al.*, 2019), there is a dearth of research on how Lagos caregivers perceive the impact of such experiences on children's cognitive development and environmental awareness within ECEC settings. Understanding these perceptions is crucial for designing effective nature-based learning programme and promoting their integration into Lagos preschool curriculums. It is against this background that this study examines the impact of nature-based experiences on children's cognitive development and environmental awareness from caregivers' perception in Lagos state early childhood education care centres.

### **Purpose of the Study**

The main purpose of this study is to examine the impact of nature-based experiences on children's cognitive development and environmental awareness from caregivers' perception in Lagos State early childhood education care centres.

Specifically, the study seeks to:

- examine the extent to which nature-based experiences, such as outdoor play, gardening, and exploring natural environments, contribute to children's cognitive development in early childhood education care centers in Lagos State;
- assess caregivers' perceptions on the impact of nature-based experiences on children's environmental awareness in early childhood education care centers in Lagos State;
- identify the specific nature-based activities that caregivers believe are most beneficial for enhancing children's cognitive development and environmental awareness in early childhood education care centers in Lagos State and
- explore the factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State.

### **Research Questions**

The following questions were raised and answered:

- To what extent do nature-based experiences, such as outdoor play, gardening, and exploring natural environments, contribute to children's cognitive development in early childhood education care centers in Lagos State?
- What are the caregivers' perceptions on the impact of nature-based experiences on children's environmental awareness in early childhood education care centers in Lagos State?
- What are the specific nature-based activities that caregivers believe are most beneficial for enhancing children's cognitive development and environmental awareness in early childhood education care centers in Lagos State?
- What are the factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State?

The study is hinged on Nature-based experiences (NBEs) encompass a range of activities that connect children with the natural world. These include:

- Outdoor play in parks, forests, or schoolyards (Fägerström *et. al.*, 2019)
- Gardening activities where children plant, care for, and harvest (Graça *et. al.*, 2018)
- Nature exploration walks, hikes, or field trips (Stenhouse, 2019)

These experiences provide opportunities for sensory engagement, exploration, and discovery, fostering a connection with nature.

Research suggests a positive link between NBEs and cognitive development. Studies by Kuo and Barnes (2019) indicate that exposure to green spaces can enhance attention, working memory, and cognitive function in children. Time spent outdoors fosters opportunities for problem-solving, critical thinking, and creativity as

children navigate the natural environment (Fägerström *et. al.*, 2019). Additionally, NBEs provide opportunities for unstructured play, which allows children to explore their curiosity and develop independent learning skills (Graça *et. al.*, 2018). NBEs can play a vital role in cultivating environmental awareness in children. Engaging with nature allows them to experience the beauty and complexity of the natural world firsthand (Sobel, 2018). Activities like gardening foster an understanding of ecological processes like plant growth and the interconnectedness of living things (Graça *et. al.*, 2018). Exposure to nature can also foster a sense of stewardship, encouraging children to care for the environment (Kahn & Kellert, 2022).

### Methodology

A descriptive research design was employed to investigate the impact of nature-based experiences on children's cognitive development and environmental awareness from caregivers' perspectives in Lagos State. This design allows for the collection of data on current perceptions and practices within early childhood education care (ECEC) centers. A multistage sampling procedure was employed for the study. First, five Local Government Areas (LGAs) were purposively selected within Lagos State to ensure geographic diversity. Second, a random sample of 25 public preschools was chosen from the selected LGAs. Finally, from each preschool, three caregivers were randomly selected to participate, resulting in a total sample size of 75 caregivers. A self-designed questionnaire titled "Nature-based Experiences, Children's Cognitive Development and Environmental Awareness Questionnaire (NECCDEAQ)" was developed to collect data. The questionnaire content and construct validity were ensured by experts in early childhood education and environmental psychology. The instrument demonstrated high internal consistency with a Cronbach's Alpha score of 0.89, indicating reliable measurement. Data collected were analysed using descriptive statistics, frequency and simple percentages.

### Results

#### Research Question 1:

To what extent do nature-based experiences, such as outdoor play, gardening, and exploring natural environments, contribute to children's cognitive development in early childhood education care centers in Lagos State?

**Table 1**

**Respondents' response with respect to the extent to which nature-based experiences contribute to children's cognitive development**

**Frequently (F) = 4    Sometimes (S) = 3, Rarely (R) = 2. Never (N) = 1**

S/N	Statement	F	S	R	N	X
1.	How frequently do children engage in outdoor play at the early childhood education care centers in Lagos State?	20	25	5	25	3.17
2.	How often do children participate in gardening activities at the early childhood education care centers in Lagos State?	30	20	15	10	3.67
3.	To what extent do children explore natural environments at the early childhood education care centers in Lagos State?	23	32	15	5	3.18
4.	How often do children have the opportunity to interact with nature-based experiences at the early childhood education care centers in Lagos State?	10	12	20	33	2.48
5.	How frequently are nature-based experiences incorporated into the curriculum at the early childhood education care centers in Lagos State?	20	20	15	20	2.17
	Grand Mean =	2.93				

**Source: Field 2024**



A score of 2.50 on a rating scale served as the threshold for agreement (above 2.50) or disagreement (below 2.50). The data in Table 2 suggests that respondents generally agreed with 3 items on the questionnaire, but disagreed with 2 other items which are (2.17 and 2.48) lower than the threshold of agreement. The grand Mean is 2.93 which is higher than the threshold of agreement (2.50), hence it shows that nature-based experiences, such as outdoor play, gardening, and exploring natural environments, contribute significantly to children's cognitive development in early childhood education care centers within the study area.

**Research Question 2:** What are the caregivers' perceptions on the impact of nature-based experiences on children's environmental awareness in early childhood education care centers in Lagos State?

**Table 2**

**Analysis on caregivers' perceptions on the impact of nature-based experiences on children's environmental awareness**

Strongly Agree (SA)=4, Agree (A)=3, Disagree (D)=2, Strongly Disagree (SD)=1

S/N	Statement	SA	A	D	SD	X
1.	I believe naturebased experiences positively impact children's environmental awareness.	22	27	7	19	3.37
2.	Nature-based experiences play an important role in developing children's appreciation for the environment.	20	25	5	25	3.17
3.	I think children are more likely to learn about the environment through naturebased experiences.	18	24	6	27	3.05
4.	I strongly agree that naturebased experiences should be integrated into early childhood education programs.	12	15	18	30	2.65
5.	I strongly disagree that traditional classroom activities are more effective than naturebased experiences in fostering environmental awareness in children.	10	5	30	30	2.42
Grand Mean =		2.93				

**Source: Field 2024**

A score of 2.50 on a rating scale served as the threshold for agreement (above 2.50) or disagreement (below 2.50). The data in Table 3 suggests that respondents generally agreed with 4 items on the questionnaire, but disagreed with the fifth item which is (2.42) lower than the threshold of agreement. The grand Mean is 2.93 which is higher than the threshold of agreement (2.50), hence it shows that there is significant impact of nature-based experiences on children's environmental awareness in early childhood education care centers from caregivers' perceptions.

**Research Question 3:** What are the specific nature-based activities that caregivers believe are most beneficial for enhancing children's cognitive development and environmental awareness in early childhood education care centers in Lagos State?

**Table 3**  
**Rank Order Analysis on the specific nature-based activities that caregivers believe are most beneficial for enhancing children's cognitive development and environmental awareness**

S/N	Statement	Means	X	Remarks
1.	<b>SENSORY EXPLORATION</b> Nature walks	1.67	0.47	Available
2.	Nature treasure hunts	1.88	0.33	Available
3.	Sensory bins	1.50	0.50	Available
4.	Barefoot walking	1.80	0.40	Available
5.	<b>CREATIVE PLAY</b> Nature art	1.78	0.41	Available
6.	Mud art	1.91	0.29	Available
7.	Storytelling in nature	1.94	0.23	Available
8.	Building with natural materials	1.97	0.18	Available
9.	<b>SCIENCE EXPLORATION</b> Planting seeds and observing growth	1.59	0.50	Available
10.	Collecting and identifying leaves and rocks	1.70	0.46	Available
11.	Weather observation and experiments			Available
12.	Animal tracking and identification	1.18	0.38	Not Available
13.	<b>PHYSICAL ACTIVITY</b> Nature obstacle courses	1.12	0.39	Not Available
14.	Nature yoga and mindfulness	1.08	0.27	Not Available
15.	Nature scavenger hunts	1.56	0.54	Available
16.	Ball games in nature	1.64	0.48	Available

**Source: Field 2024**

Caregivers believe that the nature-based activities which are most beneficial for enhancing children's cognitive development and environmental awareness are those with a mean score of 1.80 and above. Activities with a mean score below 1.80 are not considered as effective for achieving these outcomes. Based on the rank order analysis, the following activities are considered the most beneficial for enhancing children's cognitive development and environmental awareness: Storytelling in nature; Building with natural materials; Mud art; Nature treasure hunts and Barefoot walking. Activities such as animal tracking and identification, physical activity like nature obstacle courses and nature yoga, and mindfulness are not considered as effective for enhancing children's cognitive development and environmental awareness.

**Research Question 4:** What are the factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State?

Table 4

**Rank Order Analysis on the factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education**

S/N	Statement	SA	A	D	SD	X
1.	I believe there is positive impact of nature-based experiences on children's cognitive development, physical health, social skills, and environmental awareness	15	30	5	35	3.25
2.	I believe nature-based experiences align with the overall educational goals of the ECEC center	18	20	22	15	3.18
3.	Caregivers' own comfort level with spending time outdoors and their personal connection to nature can influence their support	29	22	15	9	3.68
4.	Cultural values regarding outdoor play and interaction with nature might influence caregiver perspectives	10	12	15	43	2.48
5.	Compatibility of nature-based experiences with existing curriculum standards can influence support.	22	25	13	15	3.40
Grand Mean =		3.20				

#### Source: Field 2024

A score of 2.50 on a rating scale served as the threshold for agreement (above 2.50) or disagreement (below 2.50). The data in Table 4 suggests that respondents generally agreed with 4 items on the questionnaire, but disagreed with the fifth item which is (2.48) lower than the threshold of agreement. The grand Mean is 3.20 which is higher than the threshold of agreement (2.50), hence it shows that there are significant factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers.

#### Discussion of Findings

Based on the data presented in Table 1, it can be inferred that nature-based experiences, including outdoor play, gardening, and exploring natural environments, contribute significantly to children's cognitive development in early childhood education care centers in Lagos State. For example, a study by Wells and Evans (2023) found that exposure to natural environments can enhance children's cognitive abilities, such as attention and problem-solving skills. Similarly, Louv (2015) emphasizes the importance of nature-based experiences in promoting creativity and reducing stress in children.

The data from table 2 on caregivers' perceptions of the impact of nature-based experiences on children's environmental awareness in early childhood education care centers in Lagos State indicates that the majority of participants agree that nature-based experiences have a positive impact on children's environmental awareness. Specifically, respondents strongly agreed or agreed with statements indicating that nature-based experiences are important in developing children's appreciation for the environment and that children are more likely to learn about the environment through such experiences. This aligns with previous research by Chawla (2018), who found that nature-based experiences can enhance children's cognitive and emotional connection to the environment.

The data from table 3 suggests that caregivers believe certain nature-based activities are more beneficial for enhancing children's cognitive development and environmental awareness in early childhood education care centers in Lagos State. Specifically, activities such as storytelling in nature, building with natural materials, mud art, nature treasure hunts, and barefoot walking were identified as the most effective in achieving these

outcomes, as they all had mean scores of 1.80 and above. This finding is consistent with previous research by Chawla (2017), who emphasized the importance of storytelling in connecting children with nature and fostering an understanding of the environment. Similarly, Kytta (2022) highlighted the benefits of hands-on activities such as building with natural materials and mud art in promoting cognitive development and environmental awareness among children.

On the other hand, activities such as animal tracking and identification, physical activities like nature obstacle courses and nature yoga, and mindfulness were not considered as effective for enhancing children's cognitive development and environmental awareness, as they had mean scores below 1.80.

The data from table 4 suggest that there are several factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State. Firstly, the belief in the positive impact of nature-based experiences on children's cognitive development, physical health, social skills, and environmental awareness was found to be a significant factor influencing caregivers' support. This finding is supported by previous research by Chawla (2015) who argued that exposure to nature in early childhood can enhance cognitive and social development.

Secondly, the alignment of nature-based experiences with the overall educational goals of the ECEC center was also identified as an important factor influencing caregivers' support. This finding is consistent with the work of Bell and Dymont (2024) who emphasized the importance of integrating nature-based experiences into curriculum planning to meet educational objectives. Additionally, caregivers' own comfort level with spending time outdoors and their personal connection to nature were identified as influential factors in supporting nature-based experiences. This finding is in line with the research of Sobel (2018) who highlighted the significance of caregivers' attitudes and beliefs in shaping children's experiences with nature. On the other hand, cultural values regarding outdoor play and interaction with nature were found to be a factor that influences caregiver perspectives. This finding aligns with the work of Zelenski *et al.*, (2015), who emphasized the need to consider cultural beliefs and values when promoting nature-based experiences in early childhood education.

Lastly, the compatibility of nature-based experiences with existing curriculum standards was also identified as a factor influencing caregivers' support. This finding is consistent with the research of Ernst (2022) who argued that nature-based experiences can be integrated into curriculum standards to enhance learning outcomes. The findings suggest that there are significant factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State. Future studies could delve deeper into the specific ways in which these factors can be addressed to promote the integration of nature-based experiences in early childhood education.

## **Conclusion**

Based on the findings of the research study, the research findings suggest that nature-based experiences play a crucial role in enhancing children's cognitive development and environmental awareness in early childhood education care centers in Lagos State, according to the perceptions of caregivers. The study revealed that outdoor play, gardening, and exploring natural environments are significant activities that contribute to children's cognitive development. Caregivers also believe that these nature-based experiences are beneficial for enhancing children's environmental awareness. It was also found that certain factors such as the availability of resources and training influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers. Overall, the research highlights the importance of incorporating nature-based activities in early childhood education to foster children's cognitive development and environmental awareness.

## **Recommendations**

The following recommendations were made based on the findings of the study:

- There is need to encourage early childhood education care centers in Lagos State to prioritize nature-based experiences, such as outdoor play, gardening, and exploration of natural environments, to enhance children's cognitive development.
- There is need to provide training and resources for caregivers in early childhood education care centers in Lagos State to support and facilitate nature-based activities that promote children's environmental awareness.



- There is need to incorporate specific nature-based activities that caregivers believe are most beneficial for enhancing children's cognitive development and environmental awareness into the curriculum of early childhood education care centers in Lagos State.
- There is urgent need to identify and address the significant factors that influence caregivers' support for incorporating nature-based experiences into the curriculum of early childhood education care centers in Lagos State, such as lack of resources or knowledge.
- There is need to foster partnerships and collaborations between early childhood education care centers, community organizations, and local authorities in Lagos State to create opportunities for children to engage in nature-based experiences that support cognitive development and environmental awareness.

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