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ENVIRONMENTAL FACTORS AND SCIENCE LEARNING: AN EXPLORATION OF STUDENTS' PERCEPTIONS IN AWKA EDUCATION ZONE

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ABSTRACT
This Survey is on Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zon. The study was guided by four research questions and purpose of study. The descriptive survey research design was adopted for this survey. The population of the study comprises all 2326 science students in the 19 public secondary schools in Awka South L.G.A. Sampling random technique through balloting was used to select the five schools and 10% of the population which gave approximately 250 sample size. The instruments for data collection that guided the study were a structured questionnaire prepare by the researchers titled Questionnaire on the Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zone (QEFSLAESP). The questionnaire consisted of 23 items. The instrument was validated by 3 experts. A reliability test was conducted using Cronbach Alpha method and the result was 0.88. The researchers administered copies of the questionnaire with the help of five research assistants. The data collected were subjected to descriptive statistical analysis using. (SPSS) version 22.0. Based on the findings of this study it has been empirically proven that school environment has positively influence students' academic performance in science. It is recommended that school administrators should see that school environment has positively influence students' academic performance of science students among others.

Keywords: Environmental Factors, Science Learning, Exploration and Students' Perceptions.

Introduction
The drive of education is to enable young individuals to participate more actively in the development of the country. This objective is achieved by equipping them with the necessary knowledge and skills crucial for national growth, while also promoting the right attitudes. Such a strategy assures that alumni at every educational stage acquire both scientific and practical abilities that can be utilized for paid employment, entrepreneurship, or further training. A strong foundation in science education is vital for fulfilling this aim. This can be accomplished through science education. Successful science education relies on a positive learning atmosphere (Das, 2015). Students are most successful in learning science when the educational setting encourages their active participation in

classroom activities. Also, conducive school environment allows them to engage actively in experiments, demonstrations, class discussions, and other meaningful learning experiences. The setting in which science is taught either boosts or impedes learners' interest affecting the overall performance of school education (Ogunniyi, 2019). Wright (2019) also discovered that science should be taught and learned in a suitable learning environment in order to help students develop the ability to create hypotheses, which may be taught and retained over time. When learning fundamental science process skills, the same contextual factors were taken into account. Tsavga (2016) maintains that the learning environment plays a vital role in determining how students perform or respond to circumstances and situations around them. This implies that no society is void of environmental influences. The learning environment determines to a large extent how a student behaves and interacts, that is to say, the environment in which we find ourselves tend to mould their behaviour to meet the demands of life whether negatively or positively. Likewise, the desire for both qualitative and quantitative education has multiplied the problem of providing an effective and conducive learning environment for teaching and learning.

While Khasawneh et al (2023) wrote that learning environments is a critical factor in determining the quality of students' learning, it is also considered as one of the main factors that contribute to achieving high teaching quality and good learning outcomes among students. From the on-going it means that the school helps in the acquisition of appropriate skills, abilities, and competencies of both mental and physical nature as equipment for the individual to live in this society. No one acquires relevant and balanced knowledge of facts about local and world phenomena without paying attention to their environment. Learning environment refers to the diverse physical locations, contexts, and cultures in which students learn. According to Kuhlenengel et al (2021) inadequate ventilation has been associated with elevated indoor temperatures in schools with impaired performance. Moreover, Ahmed et al (2022) opined that potential benefits were found on speed and accuracy of tasks of cognitive performance when indoor temperature was conducive compared to higher temperatures and poorer ventilation rates both ventilation and thermal environmental control are important and need to be improved for achieving optimum learning conditions.

Also, Ahmed et al (2022) opined that impairment in mental functions attributed to the effects of indoor air quality and thermal conditions has received considerable attention in the past decade, particularly for educational buildings where students' cognitive performance is essential to foster learning. In the same vein Abenga (2016), opined that an improved environmental condition leads to higher intelligence scores while poor environmental conditions reduce these scores. Several environmental factors can influence students' academic performance, which are classroom lighting, school location, school climate and air quality (ventilation), and library services. A healthy and conducive environment for students is crucial for their overall well-being and academic progress. The learning

environment dramatically affects the learning outcomes of students. Lighting, make up the factor that could be confounding variables distracting students in class. A wide range of stimulus conditions fall into the category of classroom environmental variables and setting events. Some of these conditions are temperature, lighting, noise level and, the presence or absence of peers or adults (Granstorm, 2016). Ventilation rates and elevated temperatures have been associated with students' self-reported stuffiness as reported by Turunen et al (2014). Similarly, a study by Shendell et al. (2019) states that improving classroom ventilation inadequate ventilation and elevated temperatures in classrooms have been linked to students' self-reported feelings of stuffiness and poor indoor air quality. This suggests that poor ventilation and high temperatures contribute to a less comfortable and potentially less conducive learning environment. Poor indoor environmental quality in classrooms may be a risk for health symptoms and cause absence from school.

School location on the performance of students in public secondary schools has been a concern of many educationists. Ezeh (2018) opined that school locations are known to influence students learning through the quality of teaching staff and the availability of facilities, the choice of location of the school site have been indispensable aspects of any effective school planning. This is because it is the site that can influence the type of school to be built and the quality and quantity of the buildings. There is a growing body of research that suggests a strong relationship between school climate and academic performance. According to a meta-analysis of over 200 studies, "positive school climates are associated with higher academic performance and engagement" (Thapa et al., 2013). In addition, positive school climates can lead to a reduction in disruptive behavior and other forms of misconduct, which can detract from academic progress. A study of middle schools found that schools with positive climates had lower rates of student absenteeism and higher rates of positive student behavior (Gage et al., 2013).

Classroom lighting has a significant influence on the academic performance of students in learning science. Well-designed lighting can improve concentration, reduce eyestrain, and increase alertness, which can enhance students' academic performance. According to a study conducted by Fisher et al. (2017), poor lighting can have a negative impact on students' reading and learning abilities, as well as cause visual discomfort. The study found that students who were exposed to higher levels of light intensity performed better on visual discrimination and cognitive tasks compared to those with lower light levels.

Alkhabra (2024) This study examines the effect of dynamic lighting systems to boost reading performance. The result indicated that different lighting conditions have a significant impact on cognitive function, hormonal production, mood regulation, circadian rhythms (and thus, on sleeping patterns), make a big difference to students' attention span, concentration, motivation, and even behaviour. Poor lighting conditions can lead to eye strain, headaches, and fatigue,

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which can ultimately decrease a student's ability to concentrate and learn. Proper lighting design can improve concentration, visual comfort, and alertness, which can positively impact students' learning outcomes. Therefore, educators and administrators should invest in adequate and adjustable lighting systems to create an optimal learning environment for students. Academic. Meanwhile in this study, the researchers examined Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zon.

Statement of the Problem

The learning environment plays a crucial role in shaping students' academic performance, particularly in science subjects. Despite efforts to improve science education, students' performance in science subjects remains a concern in many educational zones, including Awka Education Zone. There is a need to understand how students perceive the influence of environmental factors on their learning outcomes in science. This study aims to explore Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zon.

Purpose of the Study

The purpose of this study is to investigate Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zone. Specifically, the study sought to find out the following:

1. To examine the influence of school location on students' academic performance in public secondary schools in Awka South LGA.
2. To examine the influence of classroom organizational-structure of the school and Ventilation on the academic performance of public secondary schools in Awka South LGA.
3. To examine the influence of classroom lighting on students' academic performance in public secondary schools in Awka South LGA.
4. To examine the influence of Library services on students' academic performance in public secondary schools in Awka South LGA.

Research Question

The following research questions guided the study.

1. What is the influence of school location on students' academic performance in public secondary schools in Awka South LGA?
2. What is the influence of classroom climate and ventilation on students' academic performance in public secondary schools in Awka South LGA?
3. What is the influence of classroom lighting on students' academic performance in public secondary schools in Awka South LGA?
4. What is the influence of library services on the academic performance of students in public secondary schools in Awka South LGA?

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Methods

This research employed the use of a descriptive survey design. The area of study was carried out in Awka South LGA specifically public secondary school students. The population of the study comprises all 2326 SS2 science students in the 19 public secondary schools in Awka South L.G.A.

The sample for the study randomly selected 250 SS II science students from five secondary schools in Awka South L.G.A which gave all schools equal chance of being used for the study. Random sampling technique through balloting was used to select the five schools and 10% of the 2326 students was used. The researchers approximated the numbers to 250 science students with 50 students from each of the five schools randomly selected. The instruments for data collection that guided the study were a structured questionnaire titled Questionnaire on the Environmental Factors and Science Learning: An Exploration of Students' Perceptions in Awka Education Zone (QEFSLAESP). The questionnaire consisted of 23 items. The instrument was validated by three experts. The reliability was obtained using Cronbach Alpha and the reliability coefficients of 0.88 was obtained. The researchers administered copies of the questionnaire with the help of five research assistants. The data collected were subjected to descriptive statistical analysis by computing the Mean (Average) and Standard Deviation (SD) of each item using. (SPSS) version 22.0. The decision rule was to reject an item whose mean fell below 2.5.

Results

Research Question 1: What is the influence of School location on Students' academic performance?

Table 1: Mean rating of respondents on the influence of school location on Students' academic performance.

SN	The following are items on the influence of school location on students' academic performance.	$\bar{x}$	SD	Decision
1.	The location of my school affects my motivation to succeed in my academic pursuits.	3.16	0.73	Agreed
2.	I feel very tired and exhausted going to school due to the location of my school.	2.25	0.92	Disagreed
3.	I have missed or misunderstood important information during science classes due to the noises in the background.	3.23	0.26	Agreed
4.	I have constant headaches during science classes due to noises from the environment.	2.77	0.36	Agreed
5.	I constantly have good grades due to the location of my school.	2.28	0.17	Disagreed
6	I feel very uncomfortable studying in my school due to its location.	3.38	0.35	Agreed
	Total Mean and Standard Deviation	**2.84**	**0.49**	**Agreed**

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From Table 1, the items 1, 3, 4, and 6 agreed to be the influence of school location on Students' academic performance which implies that respondents agree that school location influences their academic performance, while items 2 and 5 disagreed. However, with the grand mean being 2.84, this implies that school location affects students' academic performance.

Research Question 2: What is the Influence of classroom climate and Ventilation on Students' academic performance?

Table 2: Mean rating of respondents on the Influence of classroom climate and ventilation on Students' academic performance

SN	The following items are on the influence of classroom climate and ventilation on students' academic performance.	$\bar{x}$	SD	Decision
7.	I feel fatigued during science classes due to poor ventilation.	3.26	0.73	Agreed
8	I feel bored during science classes due to adequate ventilation.	2.45	0.92	Disagreed
9	I feel a sense of belonging and inclusiveness during science classes due to my classroom atmosphere.	3.33	0.26	Agreed
10	The classroom climate fosters my collaboration with my fellow students.	2.17	0.36	Disagreed
11	I feel anxious and stressed due to the negative classroom climate.	3.28	0.17	Agreed
12	I feel confident and comfortable during science classes due to the positive classroom climate.	3.23	0.46	Agreed
	Total Mean and Standard Deviation	**2.95**	**0.48**	**Agreed**

Table 2, shows that items 7, 9, 11, and 12 agreed to be the influence of classroom climate and ventilation on Students' academic performance, while items 8 and 10 disagreed. However, with the grand mean was 2.95, this implies that the respondents agree that classroom climate and ventilation influences students' academic performance.

Research Question 3: What is the Influence of classroom lighting on Students' academic performance?

Table 1: Mean rating of respondents on the influence of classroom lighting on Students' academic performance.

SN	The following items are on the influence of classroom lighting on students' academic performance.	$\bar{x}$	SD	Decision
13	I cannot see the board clearly due to poor classroom lighting.	3.16	0.73	Agreed
14	Classroom lighting affects my mood and motivation to learn.	3.31	0.92	Agreed
15	My eyes are strained and I feel constant headaches during science classes due to classroom lighting.	2.23	0.26	Disagreed
16	I feel anxious and agitated while studying due to excess classroom lighting.	3.77	0.36	Agreed

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17	I am overly distracted during classes due to bright classroom lighting.	2.11	0.31	Disagreed
18	I feel comfortable during classes due to the adequate classroom lighting.	3.11	0.40	Agreed
	Total Mean and Standard Deviation	**2.94**	**0 .49**	**Agreed**

Table 3, shows that items 13, 14, 16, and 18 agreed to be the influence of classroom lighting on Students' academic performance, while items 15 and 17 disagreed. However, with the grand mean was 2.94, this implies that classroom climate lighting students' academic performance.

Research Question 4: What is the Influence of library services on the academic performance of Students?

Table 4: Mean rating of respondents on the influence of library services on the academic performance of Students.

SN	The following items are on the influence of library services on the academic performance of Students	$\bar{x}$	SD	Decision
19	I developed a love for reading and learning due to good library services.	2.81	0.73	Agreed
20	I feel discouraged to study due to inadequate science resources in the library.	2.11	0.92	Disagreed
21	I feel overly distracted in the library due to poor library services.	2.10	0.26	Disagreed
22	The library services assist me in developing critical thinking for my academics.	2.86	0.36	Agreed
23	I feel motivated to visit the library due to adequate library services.	3.46	0.61	Agreed
	Total Mean and Standard Deviation	**2.67**	**0.57**	**Agreed**

Table 4, shows that items 19, 22, and 23 agreed to be the influence of library services on the academic performance of Students, while items 20 and 21 disagreed. However, with the grand mean was 2.67, this implies that library services influenced the academic performance of Students.

Discussion of findings

The findings from Table 1 revealed that school location affects students' academic performance. The findings also are in-line with the result of Ovat et al (2021) which revealed that, there was a significant influence of school location on upper basic nine students' academic performance: urban students performed significantly better than their rural counterparts in core subjects like Mathematics and Basic Science. In like manner which is in line with the findings is the work of Bitterman et al (2018) who revealed that school location has influence on students' academic performance in mathematics and reading assessments.

The results from Table 2 revealed that classroom climate and ventilation influence students' academic performance. The finding of this study was in line with Obinya (2020) revealed that a negative classroom climate and ventilation can feel hostile, chaotic, and out of control. A positive classroom climate

feels safe, respectful, welcoming, and supportive of students learning which is also in line with the study by Shendell et al. (2019) who revealed that improving classroom Ventilation can reduce absenteeism rates in schools and improved students' performances, cognitive function, and reduced absenteeism. Another study by Carol et al., (2016) revealed that students perform better academically in classrooms with an optimal temperature range of 70°F.

The results from Table 3 revealed that classroom lighting influence the academic performance of students this is in agreement with the views of Okafor (2013) and Lezotte (2010) that lighting, school buildings, and classroom accommodation for teaching and learning, promote academic performance of students in the school. They revealed that improvements in classroom lighting can have a significant positive impact on students' academic performance, especially for students with lower ability levels. Another study by Rachel et al., (2015) revealed that students in classrooms with adjustable lighting were more alert and focused, and reported better academic Performance. Kuhlenengel et al (2021) The environmental conditions of a building refer to the lighting, thermal, and acoustical environment, as well as indoor air quality, this study solely examines the impact of the visual environment on student achievement, focusing on lighting and outside view. environmental condition led to higher attendance and improved academic achievement.

Ahmed et al (2022) This study explores the combined effects of indoor temperatures and ventilation rates on cognitive performance among female students (16–23 years old) in Saudi Arabia the result showed that both higher temperatures and poorer ventilation rates are optimum to quality learning conditions.

The results from Table 4 revealed that library services influence the academic performance of students, which is in agreement with the findings of Ovat et al (2021) revealed that library services influence the students" academic performance, and Ahmed et al (2022) who also, found out that academic library increases positive student interaction and provide colleges with the opportunity to reinforce students' instruction, by making them more open to academic help.

Conclusion

Based on the findings of this study it has been empirically proven that school environment has influence students' academic performance in science. The school location is believed to have a significant influence on students' academic performance. Classroom climate and ventilation influences the academic performances of students. lack of Proper classroom lighting affect students' academic performance. Library services also have a significant influence on students' performance.

Recommendation

1. It is recommended that classroom lighting should be optimized to enhance academic performance.
2. School administrators should see to provide adequate library services and equipment.

3. Both the Science teachers and the school heads should look for natural remedies by placing science classes at favorable classroom climate and well -ventilated.
4. It is recommended that choice of school location should be made having the conditions and students in the area in mind.

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