
Environmental Factors As Correlate Of Junior Secondary School Student's Mathematics Performance In Port Harcourt Metropolis, Rivers State

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Abstract

The study examined environmental factors as correlate of junior secondary school students' mathematics performance in Port Harcourt metropolis, Rivers State. A correlational research design was adopted for the study. Three research questions and three hypotheses guided the study. The population consisted of all (36, 232) students in Port Harcourt metropolis in Rivers State. The sample size was (400) students. Stratified sampling technique was used to select the respondents for this study. The Instruments for data collection was self-design titled "Environmental Factor Scale (EFS)" and "Mathematics Performance Test (MPT)". The instruments were validated by two other experts in Measurement and Evaluation, Department of Educational psychology, Guidance and Counselling. The reliability of the instruments was established using Cronbach Alpha which yielded (0.81) and (0.83) respectively. Data collected were analyzed using Pearson's Product Moment Correlation (PPMC) to answer the research questions and test of hypotheses at 0.05 significant level. The findings showed that there is significant relationship environmental factors and secondary school students' academic performance. Based on these findings, it was recommended that school officials, educators, and parents should think about how vital it is to study the environmental factors around the learning environment in order to meet student's needs.

Key words: Environmental Factors, Academic Performance

Introduction

Over the years, Academic performance in students were judged based on student's performance, ability at a given task, teacher or institution ability in achieving an educational goals or objectives either in a short or long-term. Academic performance involves student's ability to attain the subjects, expectations in which they are enrolled and is usually evaluated by Total Average (TA) (Hasan et al., 2017). Performance of junior secondary students is frequently evaluated based on the continuous assessment and the final result or known as total average (TA). The school is a social and learning agent that provides the environment upon which a child may be formally educated to attain educational goals. Human beings have unlimited capacity to learn, but may however, be limited by the behavior patterns and facilities that the immediate environment offers.

The quality of education not only depends on the teachers as reflected in the performance of their but also in the effective coordination of the school variables. It is believed that the school physical feature has a form of relationship with the students' academic performance in terms of the school size, structure, ownership, location and type. For a nation to attain a high level of development, adequate attention must be given to the educational sector. This is a way of creating an enabling conducive school or environment for effective teaching and learning. The school environment is a replica of the larger society with a well-organized process that is designed to be goal-oriented. The learning environment consists only of the environments that are centered on academic activities. Thus, the learning environment is a well- planned one to support academic goals. The learning environment consists of material and non- material resources in the school. Some of the key features of the school environment include the peers groups, teachers, students, organization of process, well-organized tending process, classrooms, and subjects (Elujekwute, 2021). In a learning environment, whatever you have to do, be it in the school or an office, the atmosphere is very important. In preparing for learning, the teacher must consider both the physical condition and properties of the classroom as well as established emotional control. Some studies indicate that noise sometimes serves as an aroused effect and thus increase output (Evans, & Stecker, 2021). However, this increase in output is always accompanied by a greater percentage of errors. Therefore, the learning environment should be kept in a conducive atmosphere to enhance performance. The type of school present in the school environment plays a critical role in shaping students' academic performance. This is based on the studies like the one conducted by Lewis in Earthman (2017) which identified some independent effects of school building quality in a study that involves test scores, the study revealed quality school facilities have a relevant impact on academic performance of students. This is a very good observation because the students and abilities were assessed through some test performance (Samuel, 2013). There is evidence that this may be caused by some learning level of discipline that is found and practiced in the school. Though this level of discipline may not be possible when there is an absence of quality school building that has the necessary components that must serve the purpose of quality service delivery (Earthman, 2017).

Schools are designed to provide a conducive and stimulating learning environment that supports student success. However, many government schools across the country still operate in outdated buildings that do not reflect the modern standards seen in schools in the Western world. These older schools often lack essential interior features, such as proper lighting, a good roof, and adequate space, all of which are crucial for an effective teaching and learning process. The physical structure of the school, including the building itself, is a key factor influencing the overall well-being of the school

community. For example, schools without science laboratories may struggle to achieve high educational outcomes. Additionally, school buildings are equipped with various in-house facilities, such as ventilation systems and electrical infrastructure, which are essential for the proper functioning of electronic-based learning tools. In cases where schools fail to adapt to the significant changes observed in the educational system, they may fall short in meeting their educational goals. Current school buildings, due to their structural settings, often seem to support more rote learning rather than fostering critical thinking and interactive learning (Ahmed, & Ahmad, 2017).

The structure of the building remains a thing of emphasis, as observed, the school structure attracts and helps in sustaining the interest of the learner. Also, other buildings like the library is a very important aspect of the school building that enables the school to provide the needed and current books that will aid the entire process of learning for the students and teachers ((Ahmed, & Ahmad, 2017). The library is a storehouse that is filled with enough resources that can support the advancement of knowledge and expand the scope of information. It contributes to the total development of the students and enlarges their knowledge. Ternenge & Agipu (2019) sees the library as a resource center where a collection of books, periodicals, book materials are housed for use by teachers and researchers for learning, study research, recreational activities and personal interest. It has been observed that there is a strong correlation between school libraries and educational performance. Almulla and Khasawneh (2024) argued that schools with well-functioning libraries tend to achieve better academic outcomes compared to schools with less developed library facilities. Libraries make available teaching-learning materials to augment the curriculum and give unrestricted opportunities for students' knowledge. An effectual school library gives a basis for self-education essential for facing the rigors of higher education. The importance of libraries is further emphasized in the National Policy on Education (FME, 2013), which identifies libraries as one of the most essential educational services. The policy mandates that school proprietors establish functional libraries in accordance with established standards. Additionally, it requires the provision of training for librarians and library assistants to ensure the effective delivery of this service.

The value of school library services makes a difference in academic performance (Almulla and Khasawneh, 2024). It encourages the expansion of knowledge. A well-equipped library is a stocked-up house of information. If correctly prearranged and utilized, it encourages student's concentration in reading and learning. Hence, it is said that the library is the center for a balanced diet for a learner. Libraries exist only because of books and people's desire to read them. Batchelor (2017) challenged that the number of books in the library would mean nothing if the books are not used, are out of date, unappealing or unsuitable. Aanu & Olatoye (2018) study on Library Research, revealed that libraries fail to make a meaningful impact on learning if they are merely storage spaces for outdated materials, used as a holding area for students during teachers' preparation periods, or operated solely by paraprofessional or clerical staff.

School facilities are the cornerstones of the education system. They are the necessary component in the attempt to appreciate effective teaching and learning outcome. Ternenge & Agipu (2019) emphasized that the quality of facilities has influenced not only on the educational result but on the comfort and happiness of students and teachers. Batchelor (2017) have pointed out that the availability of adequate chairs, desks and other facilities are necessary for the accomplishment of any educational goals and objectives. They discovered that a successful organization of school facilities

transcends to the development of effective educational programs and facilitates, and educational process It also results in boosting the self-confidence of teachers and students and enhances the usefulness in the resolve of the worth of a school.

The introduction of the Universal Basic Education (UBE) has affected increased enrolment in primary school from 17.9 million in 1999 to 19.2 million in 2000 and 19.4 million in 2001 (FME, 2003). This increase transcended to demand more places at secondary schools resulting in overutilization of the existing physical facilities. Investment in education requires the provision of the indispensable infrastructure and facilities that could lead the system to the desired goals and objectives (Umoru, 2014).

Learning does not occur in a vacuum. There must be an environment where learning takes place. In the formal education system particularly in the school system, the environment where learning takes place may influence the extent to which learners perform in various school subjects. The poor learning environment may result in lack of interest in school-related activities, distraction, truancy, absenteeism and sometimes outright withdrawal. However, when the learning environment is well equipped students' study interest is sustained and they are motivated towards greater achievement. A study carried out by Samuel (2013) revealed that there is a significant relationship between physical school environment and students' academic performance in senior secondary school physics. To him, the physical school environment has some influences on students' academic achievement in senior secondary school physics. In light of the above, it becomes imperative to evaluate the learning environment and adopt effective strategies which aim at improving the existing practice. Therefore, this study sought to examine environmental factors as correlate of junior secondary school student's mathematics performance in Port Harcourt Metropolis, Rivers State.

Research Questions

To guide the study, the following research questions will be formulated:

1. To what extent does school factor relate to students' academic performance in Mathematics in Port Harcourt Metropolis?
2. To what extent does peer group relate to students' academic performance in Mathematics in Port Harcourt Metropolis?
3. To what extent does home environment relate to students' academic performance in Mathematics in Port Harcourt Metropolis?

Hypotheses

The following null hypotheses will be postulated and tested at 0.05 level of significance to guide the study:

- H₀₁: School factor does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.
- H₀₂: Peer group does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.
- H₀₃: Home environment does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.

Methodology

The design for this study was correlational research design. The population of the study consisted of students in public junior secondary schools Port Harcourt metropolis of Rivers State, which were 13,969 male and 20,869 female students, with a total of 36,232 students. (Source: U.B.E. Board Port Harcourt, 2022/ 2023). The sample size for this study was (400) undergraduates, using Taro Yamane formula to determine the sample size. The sampling technique in this study was stratified sampling technique and simple random sampling. The stratified sampling procedure was used in selecting the sample for the study and (10) public junior secondary schools in the area under investigation. This technique was used because it reflects the entire population.

The instruments for data collection were self-structured questionnaire titled Environmental factors Questionnaire (EFQ), and "Mathematics Performance Test (MPT)". The questionnaire was categorized into four sections (A B C D). Section 'A' dealt with demographic data of the respondents; Section 'B' was used to elicit information on variables of environmental factors which is also sub-divided into three sub-sections. The instrument was designed on modified Likert four-point rating scale of strongly agree (SA) Agree (A), Disagree (D) and strongly disagree (SD) respectively while a test blue print was used to draw the test item for MPT to vary the questions under the curriculum covered which enabled the researcher measure for low and high learning outcome using Bloom's revised version cognitive education taxonomy.

The instruments were validated by two experts in Measurement and Evaluation in the Department of Educational Psychology Guidance and Counselling, Ignatius Ajuru University of Education and the researcher's supervisor. Their comments, suggestions and modifications of the instrument for data collection through construct, content and face validation was incorporated in the final draft of the instrument.

The reliability of the instruments; Environmental Factor Questionnaire (EFQ) and Mathematics Performance Test (MPT) were estimated using the Cronbach Alpha reliability method for internal consistency. The sample for determination of the Cronbach Alpha was 20 from schools that are not part of the study. The result showed that a reliability co-efficient of (0.80) and ((0.83) were obtained respectively, which make the instruments reliable for data collection.

The data generated for the study was analyzed using the statistical package for social science (SPSS); Pearson Product Moment Correlation (PPMC) was used to answer the research questions and test of null hypotheses at 0.05 significant level.

Results

Research Question 1

To what extent does school factor relate to students' academic performance in Mathematics in Port Harcourt Metropolis?

Hypothesis 1

School factor does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.

Table 1: Pearson's Product Moment Correlation Results of School factor and Academic Performance in Mathematics

Variables	N	α	r-value	2-tail (p-value)	Decision
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School factor	400	0.05	0.704	0.019	H₀₁: Rejected
Academic Performance					

Table 1 of Pearson's Product Moment Correlation results reveal that r-value of 0.704 with its corresponding p-value of $0.019 < 0.05$ (which is less than) the chosen level of significant was gotten. This shows a high positive relationship between School factor and academic performance of secondary school students in mathematics. Since the p-value is less than the significant level, the null hypothesis is rejected. It therefore indicates that School factor significantly relate to the academic performance of students in Mathematics in Port Harcourt Metropolis.

Research Question 2

To what extent does peer group relate to students' academic performance in Mathematics in Port Harcourt Metropolis?

Hypothesis 2

Peer group does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.

Table 2: Pearson's Product Moment Correlation Results of peer group and Academic Performance of Students in Mathematics in Port Harcourt Metropolis.

Variables	N	α	r-value	2-tail (p-value)	Decision
Peer Group	400	0.05	0.721	0.015	H₀₂: Rejected
Academic Performance					

Table 2 of Pearson's Product Moment Correlation result reveals that r-value of 0.721 with its corresponding p-value of $0.015 < 0.05$ (which is less than) the chosen level of significant was obtained. This shows a high positive relationship between peer group and academic performance of students in mathematics. Since the p-value is less than the significant level, the null hypothesis is rejected. It therefore indicates that peer group significantly relate to the academic performance of the students in Mathematics in Port Harcourt Metropolis.

Research Question 3

To what extent does home environment relate to students' academic performance in Mathematics in Port Harcourt Metropolis?

Hypothesis 3

Home environment does not significantly relate to students' academic performance in Mathematics in Port Harcourt Metropolis.

Table 3: Pearson's Product Moment Correlation Results of Home environment and Academic Performance of students in Mathematics in Port Harcourt Metropolis.

Variables	N	α	r-value	2-tail (p-value)	Decision
Home environment					
Academic Performance	400	0.05	0.830	0.012	H₀₃: Rejected

Table 3 of Pearson's Product Moment Correlation results reveal that r-value of 0.830 with its corresponding p-value of $0.012 < 0.05$ (which is less than) the chosen level of significant was gotten. This shows a high positive relationship between Home environment and academic performance of students' secondary school students in mathematics. Since the p-value is less than the significant level, the null hypothesis is rejected. It therefore means that Home environment significantly relate to the academic performance of students in Mathematics in Port Harcourt Metropolis.

Discussion of Findings

The findings of this research are done in line with the study research questions and their corresponding hypotheses.

The result of research question 1, table 1 ($r = 0.704$, $P = 0.019 < 0.05$) showed that there is a high positive relationship between school factor and academic performance in mathematics. This indicates that increase in school factor increases student's academic performance also increases. It also reveals that the null hypothesis is rejected since $p < 0.05$ the chosen level of significant. Therefore, there is significant relationship between school factor and student's academic performance in mathematics in Port Harcourt Metropolis.

This finding is in agreement with Omolo et al. (2019) who found out that student's success in academics can be realized if the learning environment is conducive and supportive. Learning environments today need to embrace a variety of places, ideas, and people that the modern world demands in terms of flexibility of space, time and technology. Also, the result of Iweka (2016) study revealed that there is also positive significant relationship between the mean of students' learning environment and their academic achievement. School factors play an important role in the learning of mathematics. This is also in line with the study is Orlu (2013) who revealed that academic performance is affected by environment, that improper maintenance of fixtures led to lower than average student's performance, home background has effect on the academic performance of students and the use of internet has made students to be lazy in their academic works. This could be that school factors have influence on the learning process of students which eventually affected their performance in the test and exam.

The result of research question 2, table 2 ($r = 0.721$, $P = 0.015 < 0.05$) showed high positive relationship peer group pressure and academic performance of students in mathematics. Since the p-value is less than the 0.05 significant level, the null hypothesis is rejected. It therefore indicates that peer group significantly relate to the academic performance of students in Mathematics in Port Harcourt metropolis. This finding is in agreement with Filade et al. (2019) who found out that peer group has significant influence on academic performance of undergraduate students. Also, there is significant relationship between peer group and academic performance of students. The finding is in line with the views of Ajibade (2016) who agreed that the peer group influences learning and certain factors like the social economic status and parental factor as they determine membership in most groups. It is generally observed that peer group has a lot of

influence on students. This is seen from the role-played by the peer group in the life and learning of a child, it is believed that students feel more comfortable and relaxed among fellow students. A child who is brilliant and surrounded by dull friends would lose interest in learning. On the other hand, a peer group which inclined to study would have positive effect on a dull member towards learning and stimulate his/her interest on learning. Katz (2020) wrote that the nature of a peer group determines the impact on the motivation of and achievements of its member. This could be that peer group has influence on their learning process of students which eventually affected their performance in the test and exam.

The result of research question 3, table 3 ($r = 0.830$, $P = 0.012 < 0.05$) showed that there is relationship between home environment and academic performance of students in mathematics. Since the p-value is less than the significant level, the null hypothesis is rejected. It therefore indicates that home environment significantly relates to the academic performance of students in Mathematics in Port Harcourt metropolis. This is in line with Parveen (2017) that studied students' home environment and was of the view that it significantly influences student's childhood which has further influences on adult life of the child. Muola (2020) also believe that home environment hinders or support children overall development. Parents' attitudes play a dominant role and where it is supportive enhances children's performance and has positive impact on the child's development. Interactions of family members are contributive for students' as it enables them to improve their linguistic, social and intellectual skills.

In support of the study, Hussain and Naz (2013) emphasized that families involving children in decision-making processes help build their self-confidence, enhance their self-esteem, and contribute to their social development. They further noted that frequent interactions among family members at home play a crucial role in fostering these outcomes. Head of the family communicate messages to family members to perform home related activities at home and outside of it. The tune, words and approach in communication reflects the attitude of the head of the family and the reply of family members to the head of the family has the same ingredients which also constitutes their attitude towards the head of the family and his/her communication. Besides, family decisions are major factor that involve in-depth interactions of the family members. It is the stage from where the importance of family member's say/opinion can be judged. In view of this, Khan et al. (2019) also agreed that positive domestic environment is the prominent indicator of students' success in their academics. They further added that teaching learning process carried out at school is incomplete without the support of home environment. The researcher is of the opinion that home environment has positive effect on students' academic performance.

Conclusion

Environmental factors are the internal conditions that influence students' academic performance such as school factors, peers group pressure, and home environment within the school that influence students' academic achievement. The researcher, therefore conclude that environmental factors significantly relate to the academic performance of students in mathematics in Port Harcourt Metropolis of Rivers State.

Recommendation

Based on the findings of the study, the following recommendations were made;

1. School officials, educators, and parents should think about how vital it is to understand students' personality qualities. This is due to the fact that each student is unique and has various characteristics. It is therefore, essential to study each individual in order to meet their needs.
2. Principals and head teachers should attend seminars and workshops that teach the importance of a well-managed human resource, physical resource, financial resource and learning techniques. This is because the study depicted majority of the schools are facing a challenge in schools.
3. Students should learn the personality traits that enhance academic performance like anxiety management traits and creativity when learning.

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