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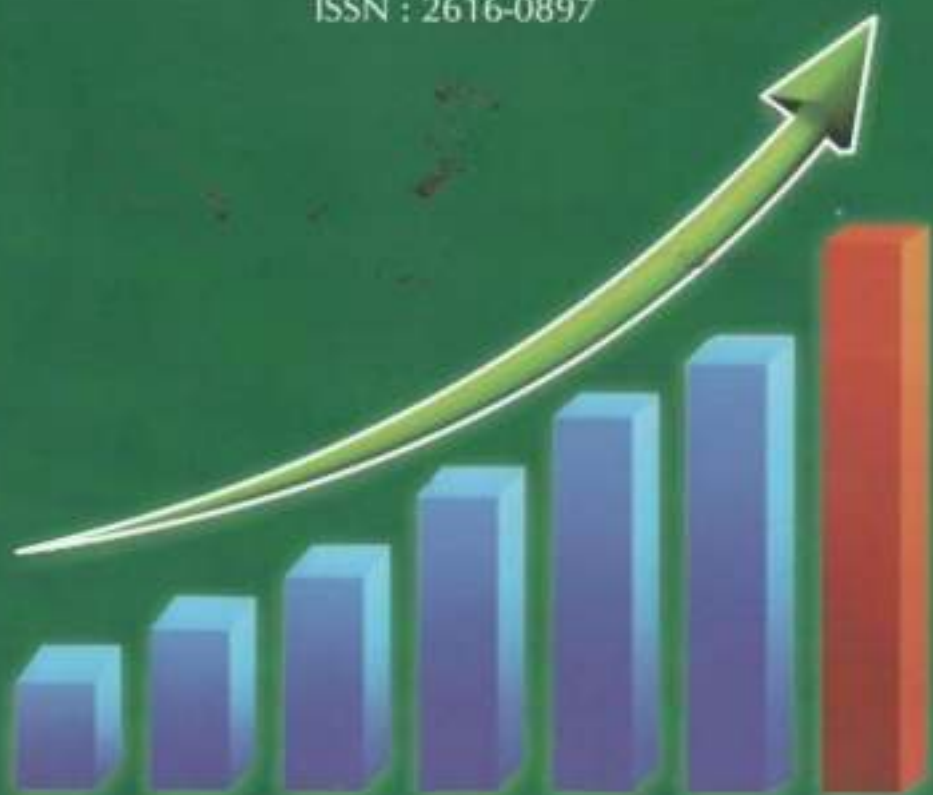


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RELATIONSHIP BETWEEN CLASSROOM LAYOUT AND STUDENTS' ACADEMIC ENGAGEMENT IN PRIVATE SECONDARY SCHOOLS IN GOMBE STATE

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Abstract

This study investigated the relationship between classroom layout and student engagement in secondary schools within Gombe metropolis, Gombe State. The study framework contained four independent variables, namely: classroom lighting, interior designs, flexible furniture and ventilation. The dependent variable of this study was Students Academic Engagement. Descriptive research design of the survey method was used in this study. The population consisted of all the SSI, SSII and SSIII students of private senior secondary schools within Gombe metropolis, Gombe State. 200 students were selected as samples for the study using random sampling techniques. Two hundred copies of questionnaires were distributed, and only 192 copies of the questionnaire were returned, giving the study a response rate of 96%. The obtained data was analyzed using Pearson Product Moment Correlation (PPMC) statistics at 0.05 level of significance. The findings of this study showed that lighting had no significant correlation with the students' academic engagement ($r = -0.02$), interior designs had a weak correlation with the students' academic engagement ($r = 0.109$), flexible furniture had a strong correlation with the students' academic engagement ($r = 0.430$) and ventilation had a very strong positive correlation with the students' academic engagement ($r = 1.0$). This study concludes that, good classroom layout does not only support learning needs of students for proper academic engagements but also assist teachers to effectively manage their class activities, cater for student differences, and in turn help in establishing a highly suitable condition for learning. It was recommended that since air movement improves the comfort of students in the classroom, ventilation should be of utmost importance to school administrators and teachers as it affects the learners' engagement in the class; hence, important measures such as opening windows fully when students are engaged in class activities, using air diffuser or carbon dioxide detectors as proxy for classes with high occupancy rates should be put in place for effective ventilation in the classrooms.

Keywords: Classroom Layout, Lighting, Interior Design, Flexible Furniture, Ventilation and Student Engagement.

Introduction

Secondary education is one of the levels of education received after the primary education and before the tertiary level (Federal Government of Nigeria, 2013). The underlying principle here is that, secondary schools should prepare the individuals for useful living within the society and for higher education. The expectations and objectives of secondary education are normally accomplished in the classroom using a well-planned curriculum through effective classroom management skills. Over the years, noteworthy studies (Enwezor, 2021; Gietz, McIntosh, 2014; Schunk & Meece, 2012) have been completed in the field of education that shows how school environment significantly relate and affect retention, attention, motivation, learning and academic achievement of students in school. No doubt, as a good amount of a child's time is spent sitting in the classroom where necessary skills, knowledge, experiences needed to become a useful member of the society are being imparted; the anticipated objectives of education is accomplished using a well-planned curriculum through effective classroom management. The classroom is the power-house in which the success or failure of instructional delivery is determined. It is a learning environment where all the factors like lighting, colour, sound, space, furniture, among others necessary for conducive learning are put in place (Wigwe, 2013). While a recent study by the University of Salford discovered that classroom design can positively or negatively influence learning by 25%, many education stakeholders have been convinced that a good classroom layout should strike a balance between teaching method and learning outcomes that takes place in the classroom to create a learning environment that facilitates fulfilling experience.

With the classroom being such an important place in the growth of a child in school, it is important to understand the ways in which this environment can influence teaching and learning process in order to receive maximum effectiveness of instruction. If schools really do play a large role in teaching the next generation how to be successful members of society, then every precaution should be taken to make sure that the learning environment is one that helps students thrive. Additionally, the academic engagements of students should be in line with the set objectives of the subject matter as teaching and learning takes place in the classroom to enhance students' performance. In recent time, research studies have investigated the relationship between academic engagement, student behaviour, and the classroom environment. The study of Earp (2009) posited that, classroom layout should reflect teacher educational philosophy that will facilitate group learning such that, desks are arranged to allow students to easily interact with each other and cooperatively complete group tasks. Similarly, Umar (2015) found that school environment as portrayed in the design, desk arrangement and resource availability in the classroom are associated with the performance of learners in English Language. However, Michael (2015) submitted that classroom layout can positively or negatively impact on students experiences as artificial lighting and that of the window can produce glare that affects the student experiences in the class. In the

same vein, students may at times be positioned in such a way that they are unable to see charts or blackboard that a teacher is using.

Classroom layout for the 21st century learners should be prioritized to accommodate the emerging and expanding population and technology that requires modern and special facilities. The way teachers arrange technology in the classroom like other parts of classroom layout, related to their teaching philosophy, hence, the design of classroom need to take into account the types of computers chosen depending on how the class is designed. For instance, if a teacher is designing a room to emphasize group work, screens need to be selected that are large enough to give all members of the group an adequate view of the work being done. Also, teachers who want to emphasize a more traditional classroom layout may instead opt to use a smaller screen that is obscured in a part of the room to better emphasize the traditional lecture format. For instance, a study conducted to investigate the layout of technology integrated classrooms revealed that, teachers used vastly different approaches to using technology, a single computer assigned to each group so that students would be able to use it collaboratively rather than each student working independently.

Meanwhile, sustaining such facilities needs experts who focus on the attainment of learning objectives and exhibits good social behaviour in achieving stated objectives. These objectives can be achieved if teacher creates an environment that encourages cooperative learning, care for each other, and responsive to the use of materials that assist in generating new knowledge and skills. Attaining these aspects is a reflection of good social engagement behaviour between students and teachers in school. In the years since the submission of Montello (1988) found a significant relationship between high participation of students, feelings of belonging and good classroom environment; classroom environment has become an important factor in students' learning experience in the school. Given that students spend most of their school time assigned to a seat for the entire day, making classroom environment and layout a vital part of their learning experiences is necessary.

Previous studies investigated the influence of classroom designs on students' learning and open learning spaces, flexible seating and writing surfaces (Barber, 2006; Graetz & Goliber, 2002; Hunley and Schaller, 2006). While looking at the components of classroom environment, some researchers (Janowska & Atlay, 2007; Slegers, Molenaar, Galetzka & van der Zanden, 2012; Lombardi and Wail, 2006; Sanders, 2013; Wannarka and Ruhl, 2008; Fernandes et. al, 2011; Rogers, 2020) focused on aspects like seating position, classroom design, aesthetics density, privacy, noise, windows, ventilation and classroom ecology. Rogers (2020) in a study that focused on how seating layout affects overall assessment and performance of fourth grade students in an elementary school. The study described ways in which desks can be arranged in the classroom to influence students' participation using layouts of small groups, horseshoe, and pairs. When students were asked directly during interview what the best layout was, the horseshoe was the most chosen formation of all the three layouts.

This study focused on the interactions among variables in a social system which in this context is the school, hence systems theory is considered suitable as it supports the study. The system theory is relevant to this study as it deals with the relationship between or among inputs to be transformed into outputs. A system is considered as a set of interrelated parts that operates as a whole to achieve a common goals (Peretemode, 1999). A system approach to educational institutions attempts to view the school as a unified, purposeful organization or as a system composed of interrelated parts. Educational institutions are systems and sub-systems in which the components among others include human resources, material resources, financial resources, physical facilities among others. A social system as described by Parson (1951) is the plurality of individual actors interacting with each other in a situation, which has at least a physical or environmental aspect. The application of social systems theory to school administration was delineated by Gerzels and Guba (1957). A social system could be identified with the characteristics like a group of people; in a purposive interaction; which are interdependent; with pattern formed into institutions in a geographical location. This implies that, school as a social system consists of inputs, process, outputs, feedback and environment. Hence, for teaching and learning to be effective, all variables involved must interact either partly or as a whole for the goals of education to be actualized. Thus, this study examined the relationship between the sub-sets of classroom layout such as lightning, ventilation, interior design and flexibility of furniture as it relates to students' academic engagement in the classroom.

Similarly, Barkley's (2010) model of students' engagement also provides a theoretical base for this research study. Students' engagement in classroom as described by Barkley is a process whereby students experience a continuum and synergistic interaction between motivation and active learning (Barkley, 2010). The classroom environment should create synergy between active learning and motivation thereby students having a sense of community, helps students work at their optimal level of challenge and help students learn holistically. On this note, attention should be paid to how the classroom design and conditions promote students' academic engagements.

The concept of students' engagement is predicated on the belief that learning improves when students are inquisitive, interested, or inspired; thus, student engagement is the degree of attention, curiosity, interest, optimism and passion that allows students show when they are learning or being taught. This extends to the motivation they have to learn and progress in their education. Contextual factors such as family, peer group, school environment is among the main factors contributing to the academic engagement of students in school (Sahil, 2011; Hamid, Othman, Ahmad & Ismail, 2011; Audas & Willms, 2001). Specifically, classroom physical environment plays a vital role in operation and functioning of teaching and learning as they determine the excellent performance of a school. It has been regarded by Basit (2005) as one of the stimulating factors that play a fundamental role in improving academic engagement in the school system.

When it comes to classroom participation, there are multiple configurations that teacher may want to experiment with that will make them engage with one another and also have equal access to the teacher. With appropriate classroom layout, concentration can be increased, behaviour can be improved, and teachers can support learning outcomes more effectively. Although, student engagement focuses on measurable aspects such as behavioural and disciplinary actions, the extent of student engagement is indicated by students' participation in their classes, their enthusiasm in learning and the quality of their completed class assignments (Azman, Ali, Tamuri & Jelas, 2005; Lewis, 2008, Trowler, 2010). Classroom environment should encourage teachers to be able to use consistent cues that foster intellectual, emotional, behavioural, physical, social and cultural engagement of learners that will help them stay on task and remain engaged during a class. By this variation in classroom routine, teachers can reduce monotony and potential disengagement that may arise when learners are seated, doing similar tasks for extended period of time. Globally, determining a suitable classroom layout usually pose a challenge for teachers. More specifically, the arrangement of desk leaves them to decide which arrangement will benefit specific learning circumstances and work best for learners Rogers (2020). Secondary schools in Nigeria which is immediate institutions in the schooling process do not enjoy the expected quality of classroom layout. The public secondary schools do not have classroom arranged in the way that is attractive, conducive and suitable for teaching and learning while most private secondary schools attempt to apply the concept of classroom layout considering its influence on academic engagements of students. On this note, significance of classroom layout on academic engagement has not been given the necessary attention that it deserves in public and private secondary schools in Nigeria and has therefore overwhelmed school teachers and administrators. It is against this background that this study sought to investigate the relationship between classroom layout and student engagement in secondary schools in Gombe State, Nigeria.

The purpose of this study is to examine the relationship between the classroom layout on students' academic engagement with focus on classroom lighting, interior designs, flexible furniture and ventilation. Specifically, this study examined if

1. there is a significant relationship between classroom lighting and academic engagements of secondary school students in Gombe State.
2. there is a significant relationship between interior designs and academic engagement of secondary school students in Gombe State.
3. there is a significant relationship between flexible furniture and academic engagements of secondary school students in Gombe State.
4. there is a significant relationship between ventilation and academic engagement of secondary school students in Gombe State.

Methodology

The research design adopted for this study was the descriptive survey. The design enabled the researchers to seek the opinion of a population from representative sample upon which conclusion, inference and generalizations were made on a contemporary phenomenon. The population of the study consisted of all the private school students within Gombe metropolis, Gombe state. Four secondary schools were selected using the stratified random sampling technique. In each school, fifty (50) students selected by simple random sampling technique, making a total of two hundred students selected as sample from the four (4) secondary schools. The participants comprise of the three levels of Senior Secondary School Students in Gombe State. Data was collected using two instruments with sections entitled: Classroom Layout Questionnaire (CLQ) and Students Academic Engagement Questionnaire (SAEQ) designed by the researchers. Section A consist of demographic variables to elicit information such as age, class, gender of the participants while section B had 20 question items related to influence of classroom layout on students' academic engagement. A four (4) Likert-point scale ranging from strongly agree (1), agree (2), disagree (3) and strongly disagree (4) was used. In establishing the validity of the instruments, the questionnaires were subjected to the perusal of research experts in educational foundations from Federal University Kashere and University of Ilorin. The comments and modifications made by these experts were considered and incorporated in the final selection of items on the questionnaires. In furtherance, Cronbach Alpha computerized reliability analysis scale (coefficient Alpha) was used to determine the reliability of the instrument. A reliability score with the coefficient value of 0.782 was obtained after administering the questionnaires on 20 set of students who were not part of the sampled participants for the study. Thus, the procedures adjudged the instrument reliable. Approval of the school authority was sought and given before distributing the research questionnaires to the students and data obtained were analysed using descriptive statistics and correlation analysis in the Statistical Package for Social Sciences (SPSS).

Results

Answering of Research Questions

To the research questions, Pearson correlation was used to determine if there was a statistically significant relationship between the variables. (See Table 2 below). Pearson Correlation analysis in this study indicated the significance, direction, and strength of the bivariate relationship between the variables (Campbell & Machin, 1999).

Table 2: Relationship Between Classroom Layout and Students' Academic Engagement of the Respondents

Engagement	Pearson Correlation	Light	Interior Design	Furniture	Ventilation
		0.02	.109	.430	1.00
	Sig. (2-tailed)				
	N	192	192	192	192

** . Correlation is significant at the 0.01 level (2-tailed).

Research Purpose One: The relationship between classroom lighting and academic engagements of secondary school students in Gombe State.

The result showed light had no significant correlation with the students' academic engagement ($r = 0.02$) (See Table 2 above). That means that presence of good lighting in the class does not lead to students' academic engagement.

Research Purpose Two: The relationship between interior designs and students' academic engagement of secondary school students in Gombe State.

The result showed that interior designs had a weak correlation with the students' academic engagement ($r = 0.109$) (See Table 2 above). That means that presence of interior design in the class leads to students' academic engagement.

Research Purpose Three: The relationship between flexible furniture and academic engagements of secondary school students in Gombe State.

The result showed that flexible furniture had a strong negative correlation with the students' academic engagement ($r = 0.430$) (See Table 2 above). That means that presence of flexible furniture in the class lead to students' academic engagement.

Research Purpose Four: The relationship between class ventilation and academic engagement of secondary school students in Gombe State.

The result showed that ventilation had a very strong positive correlation with the students' academic engagement ($r = 1.0$) (See Table 2 above). That means that presence of ventilation in the class lead to students' academic engagement.

Discussion of Findings

There is a significant relationship between classroom lighting and academic engagements of secondary school students in Gombe State.

The findings of the study revealed that lighting had no significant correlation with the students' academic engagement and presence of good lighting in the class does not lead to students' academic engagement. Although research study has shown that daylight can impact learners' mood, performance and well-being in schools, artificial lighting may generate glare that can contribute to eye strain, visual fatigue and

sometimes headache. Michael (2015) submits that classroom layout can positively or negatively impact on students' experiences as artificial lighting and that of the window can produce glare that affects the students' experiences in the class. Also, research studies (Morrow & Kanakri, 2018; Vietch & McColl, 2001) found that functioning fluorescent can be a source of flicker and have a general feeling of discomfort, illness, eye strain and reduced speed of visual search and performance in students. In this regard, the artificial illumination in the classroom undoubtedly influences the perception of comfort or discomfort of the students in their engagements.

There is a significant relationship between interior designs and students' academic engagement of secondary school students in Gombe State

Although, the result show that interior designs had a weak correlation with the students' academic engagement, the presence of interior design in the class leads to students' academic engagement. Rands (2017) posit that interior design of classroom plays an important role in the way students learn and perform their activities in the classroom, as a well-designed learning space allows students to learn more and anticipate for activities that will happen for the day.

There is a significant relationship between flexible furniture and academic engagements of secondary school students in Gombe State

The result showed that flexible furniture had a strong correlation with the students' academic engagement and presence of flexible furniture in the class lead to students' academic engagement. Rogers (2020) states that seating layout affects overall assessment and performance of fourth grade students in an elementary school. The type of furniture used in the classroom determines the level of comfort, posture and concentration of learners. Classroom of today are not well equipped to support students' engagement in terms of flexibility. In many classes, students sit in a traditional uncomfortable desks and chairs that were never moved, this may prevent teachers from configuring their classes to a smaller group or other formation to suit their lessons. Utilizing the right type of furniture such as flexible seating will help students to lean, stand or move with ease and in turn increases oxygen flow to their brain and core strengths. This will support the students to be proactive learners and keep their mind more alert and focused while in the classroom.

There is a significant relationship between class ventilation and academic engagement of secondary school students in Gombe State.

The result showed that ventilation had a very strong positive correlation with the students' academic engagement and presence of ventilation in the class lead to students' academic engagement. Research evidence shows that inadequate ventilation can have a negative consequence on student engagement and impact learning which in turn may cause an increase in learners' absenteeism in the classroom (Mendell et al, 2013). Therefore, air movement that will improve the comfort and well-being of the learners in classroom should be of utmost importance to the teacher. School administrators should also ensure that the existing building and classrooms in particular are suitable to provide learners with healthy air for breathing and to help minimize any discomfort.

Conclusion

This study examined the relationship between classroom layout and students' academic engagement in Gombe State. The study found a significant relationship between ventilation and interior designs while the lighting does not have significant relationship in this study. The classroom layout plays an important role in the aspect of learning. From the furniture students sit on to the aesthetics on the wall, and the classroom fittings; the learning process commence from the tone and warmth received in the classrooms. Studies reviewed have revealed that the layout of the classroom can affect the mood and performance of students in the school and so, it should be developed inside out since the classroom experience is central to the layout. No doubt, a good classroom layout does not only support learning needs of students for proper academic engagements but also assist teachers to effectively manage their class activities, cater for student differences, and in turn help in establishing a highly suitable condition for learning. On the part of the students, the size, the shape, the furniture, the air and humidity and all others have a remarkable impact on how well they are engaged with the class activities.

Recommendations

Based on the findings, the following recommendations were made

1. Teacher should set a good tone for the class and build a warm environment that nurture learners
2. Since lighting does not lead to students' engagement in this study, artificial lighting may not be necessary in the classroom except for laboratories or workshop and places that are not bright.
3. Teacher should have a wide variety of techniques that will keep the class organized, orderly and students focus through designs, wall papers, charts, graphs and paintings that will support students' learning and engagements in the classrooms.
4. Flexible furniture that will suit all lessons and allow students move, lean or stand without any difficulty should also be put in place for their study.
5. Important measures should be put in place by school administrators and class teachers to ensure proper ventilation such as opening of windows when students are engaged in the class activities to prevent negative consequences that could hinder learning and help deal with discomfort.

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