

Influence of Classroom Management on Teaching Styles of Science Teachers in Senior Secondary Schools in Nigeria

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Abstract

The problem of teaching styles of teachers in the science arm of secondary schools has been a subject of concern and discuss. Many studies have been carried out to investigate factors that affect teaching styles but very few have considered the role of classroom management. This study therefore investigated the influence of classroom management on teaching styles science teachers in senior secondary schools, Nigeria. Two research questions were raised and answered, and three hypotheses were formulated and tested to guide the study at .05 level of significance. The study used the descriptive research design. A sample of 6349 students and teachers was utilized for the study. The research instrument used for data collection was the questionnaire titled: Classroom Management and Teaching Styles Questionnaire (CMTSQ). The instrument was subjected to face and content validity; Cronbach Alpha reliability analysis which yielded 0.84 coefficient. The data collected were analyzed using descriptive statistics, multiple regression and independent t-test statistics. The results using multiple regression revealed that significant influence exists for all the independent variable (classroom management, $r=0.470$, $p<0.05$). The mean difference in the opinions of the respondents regarding classroom management were higher for teachers ($\bar{X}=55.6828$, $SD=8.09$) than students ($\bar{X}=53.5352$, $SD=9.46$, $t_{(6347)}=-6.268$, $p>0.05$, $F=45.363$, $p=.000$), however there was no significant difference. In conclusion, classroom management has significant influence on teaching styles of teachers. Therefore, it is recommended among others, that teachers and educators should pay attention to the effects of classroom management strategies in their schools.

Keywords: Classroom Management, Teaching Styles, Design, Communication, Discipline

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I. Introduction

The economic attainment and development of any nation depends on the quality of science education of that nation. Real development involves the creative capacity of people to effectively transform natural resources of the environment into goods and services through imaginative and practical application of their creative talents and productive labor force. Advances in science and technology contribute to the social and economic development of nations that result in improved standard of living manifested through good health, food security, adequate housing and sustainable use of natural resources, environmental protection and economic growth (OECD, 2016). Indeed, no nation can survive educationally, economically or otherwise without the knowledge of science. Thus, the importance of effective teaching of science subjects in institutions, particularly secondary schools, cannot be overstressed. Logically speaking, this cannot be done without science teachers who are expected to utilize suitable and effective instructional (teaching) methods in creating meaningful teaching and learning process in school systems.

The primary purpose of teaching at any level of education is to bring a fundamental change in the learner (Blazar, 2016). To facilitate the process of knowledge transmission, teachers need to apply appropriate teaching styles to methods and techniques that best suit specific learning objectives and outcomes. Teaching styles, sometimes referred to as teaching approaches, are described as the general principles, educational, and management strategies for classroom instruction (Tharanky, 2015). The style or approach used by teachers in presenting their lessons is very important because it can make the learners like or dislike subjects and can generate in students love for or alienate them from school (Blazar, 2016).

The combination of different styles of teaching science is therefore something each professional science teacher should not only know but also implement in their classroom. It is widely known that the teacher must consider certain factors before selecting the style(s) of teaching scientific concepts. Some of these factors include school mission statement, instructional objectives, classroom management, teaching philosophy, standard tests, etc. Many researchers have however concluded that some of these factors are quite weighty on

teachers, almost pressurizing and compelling them to adopt certain styles and approaches in teaching science subjects (Tharanky, 2015; Blazar, 2016). Two of such factors include high stakes (standard) tests and classroom management.

The classroom arrangement is the physical foundation of where students will learn (Latif *et al.*, 2018). This means that every square foot of it needs to be used for activities that support learning. The spatial structure of the classroom, where students will be seated, how the students will move about the classroom, and the whole classroom atmosphere needs to be considered, as well as how the classroom will be structured to address the academic, social, and emotional needs of the students (Cox, 2019). The management of the classroom should also be reflective of the student body and must be consistent with the needs of all learners. In addition to the way the classroom is setup and managed, the classroom environment as a whole needs to be considered: what is put on the walls, the classroom materials to be used, and where and how activities would take place (Cox, 2019).

Unfortunately, in most Nigerian secondary schools, positive planning and implementation of classroom management by teachers are influenced by problems with over-populated classrooms, inadequate instructional materials, a non-conducive classroom climate; and inadequate amount of basic materials such as seats for teachers and pupils in order to function effectively (Adeolu, 2017). This greatly fuels the negative attitude of students to learning, particularly to science subjects where scientific learning environments are almost completely lacking. The lack of resources to properly manage science classrooms also greatly affects the instructional (teaching) methods of teachers, compelling them to make-do with the insufficient means and opportunities available (Adeolu, 2017).

For a developing country like Nigeria, science is indeed needed to meet the diverse trending needs of man through invention of various technologies. For the country to significantly progress in the socio-economic sphere, we cannot afford to relegate learning of science in schools. In other words, Nigeria (like any other nation) cannot survive economically if the future generations have a negative attitude towards the fields of science. From the foregoing, the importance of addressing the issues relating to effective classroom management, and their influence on students learning and teachers' methods, cannot be overemphasized.

Theoretical Review/Framework

Theory of Planned Behavior

The successful transmission of scientific knowledge by a teacher is not the only criterion for good instruction. Rather, decades of scientific teaching and learning studies demonstrate a consistent assumption that excellent science teaching is founded on how instructors regard science, their attitudes about how science should be taught, and the extent of a teacher's scientific understanding.

The image of successful teaching has swung back and forth between two opposing views over the years. On the one hand, there's the "conventional," "teacher-centered," "rote-learning," and "drill-and-practice" method. A "progressive," "student-centered," "meaningful learning," and "reform-oriented" approach, on the other hand, can be found. Teachers who follow the conventional style have been referred to as "knowledge distributors" since they directly communicate their information to their students. On the other hand, reform-oriented teachers have been seen as "facilitators," or "stimulators" given that they assist students' scientific learning as they create a learning environment that reflect students' ideas (Shah and Khan, 2015; Pyhalto *et al.*, 2020).

The theory of planned behavior (TPB) proposed by Fishbein and Ajzen (1975) has gained one of the most successful psychological models used to predict and understand human behavior and attitude that is socially relevant. Although few studies have employed the TPB in mathematics education, success in other academic areas, such as science education and special education has implied that this theory can play a significant role in understanding a structural approach to teacher choice and change in teaching practice (Hacieminoglu, 2016; Owan *et al.*, 2020). The TPB is grounded on the assumption that "human beings are usually quite rational and make systematic use of the information available to them". The model suggests that the variables that influence the target behavior have a causal relationship. According to the model, instructors' desire to teach science in a student-centered manner, known as behavioral intention, is the best predictor of change in scientific teaching methods (BI). The other three predictor factors, namely, attitude toward the behavior (AB), subjective norm (SN), and perceived behavioral control, all influence behavioral intention (PBC). Similarly, students' learning habits are best predicted by their determination to learn science in a specific way.

Thus, the theoretical TPB model was conceptualized into the structural equation model (SEM) to investigate teachers' change in scientific instructional practice (Hamidu and Robson, 2019). This theory is suitable for this study because it establishes the relationship between the influence of classroom management and the teaching methods of science teachers.

Aim and Objectives of the Study

The aim of this study was to assess the influence of classroom management on teachers' styles of teaching science in senior secondary schools in Nigeria.

The specific objectives of the study include, to:

- i. ascertain the level of classroom management factors (discipline, classroom design, communication) in senior secondary schools in Nigeria.
- ii. ascertain the preferred teaching styles (expert, formal authority, personal model, facilitator and delegator) among science teachers in senior secondary schools in Nigeria.
- iii. determine the composite influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.
- iv. determine the relative influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.
- v. examine the significant mean difference between the opinions of teachers and students with regards to classroom management factors in senior secondary schools in Nigeria.

Research Questions

The study attempted to find answers to the following questions:

- i. What is the level of classroom management factors (discipline, classroom design, communication) in senior secondary schools in Nigeria?
- ii. What are the preferred teaching styles (expert, formal authority, personal model, facilitator and delegator) among science teachers in senior secondary schools in Nigeria?

Research Hypotheses

This study was guided by the following hypotheses.

H₀1: There will be no significant composite influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.

H₀2: There will be no significant relative influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.

H₀3: There will be no significant mean difference between the opinions of teachers and students with regards to classroom management factors in senior secondary schools in Nigeria.

II. Methodology

This chapter presented the methodology and procedures employed in the study. It contains information about the population of the study, sample and sampling techniques, research instrument, validity of the instrument, reliability of the instrument, administration of the instrument and method of data analysis.

Research Design

The descriptive-survey research design was adopted for this study. This research design is considered appropriate because the study involved collection of data to factually describe existing phenomena, without any manipulation or randomization. Furthermore, the research design allowed the researcher to obtain a proper picture of the present situation of the particular phenomena under study.

Population of the Study

The targeted population comprised of all Senior Secondary school science teachers and students in Senior Secondary School who registered for the 2021 West African Examinations Council (WAEC) examination.

Sample and Sampling Techniques

A total of 6,720 respondents formed the sample for this study. The study sites were mapped based on the six geo-political zones in Nigeria. Multi-stage sampling technique was used to select participants for this study. In the first stage, simple random sampling technique was used to select one state from each geopolitical zone in Nigeria, giving a total of six (6) states. Abuja, the Federal Capital Territory, was also included as a separate category because of its peculiarities. In the second stage, four (4) local government areas (LGA) were selected from each state to reflect the urban and rural areas, using simple random sampling technique, making a total of 28 LGAs. At the third stage, purposive sampling was used to select ten (10) secondary schools from each LGA, which have participated in high-stakes tests for at least five (5) years, making a total of 280 schools. In the next stage, purposive sampling was also used to select three (3) senior secondary school science teachers who teach science in selected schools, making a total of 1120 teachers. Stratified random sampling technique was used to select 20 science students in senior secondary schools, who have been registered for high-stakes tests (WAEC, NECO, UTME), making a total 5,600 students. In all, a total of 6,720 respondents, consisting of

five thousand six hundred science students (5600) and one thousand one hundred and twenty (1,120) science teachers, were used as participants in this study.

Research Instrument

The instrument for this study will be a self-developed questionnaire titled Classroom Management and Teaching Styles Questionnaire (CMTSQ)– which was designed and adapted in line with the research questions and hypotheses that were raised for the study. The instrument was used for all categories of respondents (students and teachers). The instrument was used for all categories of respondents (students and teachers). The questionnaire was divided into five sections; A, B, C, D and E. Section A of the instrument focused on the demographic data of the respondent (that is their gender, age, educational qualification, and so on). Section B elicited information on high-stakes tests with respect to SSS3 students and science teachers while Sections C comprise of items on teacher’s teaching styles. For all sections, the sub-scale was a modified Likert-type scale with four response options rates as follows: Strongly Agree (4), Agree (3), Disagree (2) and Strongly Agree (1). Also, students’ and teachers’ questionnaire were structured from the aforementioned questionnaire.

Method of Data Analysis

Data collected from the field were clean, coded and inputted into a computer system, for statistical analysis using Statistical Package for Social Sciences (SPSS) software, version 21 for mac iOS. The research questions 1 to 4 were analysed using descriptive statistics of mean (\bar{x}) *score* and standard deviation (SD). Mean was used to describe the data. A criterion mean (\bar{x}) of 2.50 was set for the study. In this case, a mean score of 2.50 and above was adjudged moderate, high and very high as the case may be while a mean score below 2.50 was adjudged low (performance) extent. Standard deviation was used to determine how responses of the respondents varied. Hypotheses 1 to 4 were tested using multiple regression while Hypotheses 5 and 6 were tested using independent sample t-test statistics. An alpha level of 0.05 significance was set for the inferential statistics.

III. Results

The purpose of this study was to investigate the influence of high-stakes tests on teaching styles of science teachers in senior secondary schools, Nigeria. This chapter presents the results of the analysis of the data collected from all respondents (science students and science teachers) involved in the study. The results are presented in tables on the basis of the research questions and hypotheses formulated for the study. Descriptive statistics (mean and standard deviation) was used to answer the research questions while inferential statistics was used to test the null stated hypotheses at 0.05 level of significance. The findings were outlined and discussed accordingly.

The research instrument was dispatched to 6700 respondents with 6349 (94.8%) of the dispatched questionnaire retrieved.

Demographic Profile of the Participants

Status of the Respondents

The study sought information on the status of the respondents. Table 1 presents a summary of the status distribution for all the categories.

Table 1: Demographic Characteristics of Respondents Status

Status	Frequency	%
Students	5501	86.6
Teachers	848	13.4
Total	6349	100.0

Source: Fieldwork, 2021

Out of the 6349 respondents, 5501 respondents representing 86.6% of the sample represented the science students while 848 respondents, which constituted 13.4%, represented the science teachers.

Gender of the Respondents

The study sought information on the gender of the respondents. Table 2 presents a summary of the gender distribution for all the categories of respondents.

Table 2: Demographic Characteristics of Gender * Respondents Status Cross Tabulation

Gender	Students	%	Teachers	%	Total (%)
Male	2710	83.1	553	16.9	3263 (100.0) 51.4%
Female	2791	90.4	295	9.6	3086 (100.0) 48.6%
Total	5501	173.5	848	26.5	6349 (100.0)

Source: Fieldwork, 2021

Out of the 6349 respondents, 3263 respondents, representing 51.4% of the sample represented male while 3086 respondents, constituting 48.6%, represented female participants. This slight difference may be as a result of gender stereotypes, which have been reported to be part of the major factors contributing to the gender-gap in the field of science¹. There were however slightly more female science students (2791) than male students (2710), suggesting that there could be an improvement in the number of females opting for science courses from high school level.

Age of Respondents

The study also sought information on the age of the respondents. Table 3 presents a summary of the age distribution for all the categories.

Table 3 Demographic Characteristics of * Respondents' Age Respondents Cross Tabulation

Age Group	Students	%	Teachers	%	Total (%)
20 and below	5501	98.8	10	1.2	5511 (100.0) 100%
21 – 30 years	0	0	132	100	132 (100.0) 100%
31 – 40 years	0	0	269	100	269 (100.0) 100%
41 – 50 years	0	0	276	100	276 (100.0) 100%
51 – 60 years	0	0	135	100	135 (100.0) 100%
60 and above	0	0	26	100	26 (100.0) 100%
Total	5501	98.8	848	501.2	6349 (100.0)

Source: Fieldwork, 2021

For the teachers, majority (31.7%) were aged between 31 and 40 years, and those aged between 41 and 50 years (32.5%). The least age range (3.1%) was between 60 and above, with respondents under this age range originating from private schools. This clearly indicated that many teachers were young and energetic with regards to handling infrastructural matters. Although the older teachers are more experienced and more familiar with instructional issues, they might be tired and might lack 21st century skills such as information and communication technology (ICT), which is a very vital component of instruction today. The student-respondents were all within the range of 20 years and below.

Professional Qualifications of Respondents

The study was also interested in finding out the professional qualifications of the respondents (teachers). The data obtained are presented in Table 4 below.

Table 4 Demographic Characteristics of Teachers' Professional Qualifications

Qualification	Frequency	%
HND/PGDE	166	19.6
First Degree	337	39.7
Masters	319	37.6
PhD	26	3.1
Total	848	100.0

Source: Fieldwork, 2021

Table 4 shows that a total of 166 (representing 19.6%) staff-respondents hold HND/PGDE, while 337 respondents (representing 39.7%) have a first-degree qualification. A total number of 319 respondents (representing 37.6%) have a Master's degree, while only 26 respondents (representing 3.1%) have a PhD. This was a positive gesture that human resources with adequate professional qualifications were involved in teaching in our schools. This could be instrumental to effective instructional dissemination. Evans (1999) had posited that the successful 21st century instructor will need to be very professional, competent, highly trained and a well-motivated individual. Majority of the respondents (39.7%) indicated that first degree was their highest professional qualification while the least indicated qualification (3.1%) were respondents with a PhD. Degree. Hence, this indicated that the respondents had the appropriate academic professional qualifications required to handle the curriculum.

Teaching Experience of Teachers

The study also sought information on the teaching experience of teachers. Table 5 presents a summary of the data obtained.

Table 5: Demographic Characteristics of Teachers' Teaching Experience

Length of Service	Frequency	%
Less than 10 years	270	31.8
10 – 15 years	242	28.5
16 – 20 years	200	23.6
21 – 30 years	124	14.6
31 – 35 years	12	1.5
Total	848	100.0

Source: Fieldwork, 2021

Out of the 848 respondents (science teachers), 270 had less than 10 years of teaching experience, representing 31.8%, 242 had 10 – 15 years teaching experience, representing 28.5%, 200 had 16 – 20 years teaching experience, representing 23.6%, 124 had 21 – 30 years teaching experience, representing 14.6% and 12 had 31 – 35 years of teaching experience, representing 1.5% of the total respondents.

School Types of Respondents

The study sought information on the type of school all respondents were related with. Table 6 presents a summary of the school types of respondents.

Table 6 Demographic Characteristics of Respondents' School Types

School Types	Frequency	%
Public School	3915	61.7
Private School	2434	38.3
Total	6349	100.0

Source: Fieldwork, 2021

Table 6 shows that 3915 respondents were from public schools, representing 61.7% of the total sample, while 2434 respondents (38.3%) were from private schools.

Marital Status of Teachers

The study also obtained information on the marital status of respondents. The data obtained is presented in Table 7 below.

Table 7: Demographic Characteristics of Teachers' Marital Status

Marital Status	Frequency	%
Married	624	73.6
Single	173	20.4
Divorced	51	6.0
Total	848	100.0

Source: Fieldwork, 2021

Table 7 shows that 624 respondents were married, representing 73.6% of the total sample (teachers) used in the study, 173 respondents were single representing 20.4% of the sample and 51 respondents were divorced, representing 6.0% of the total sample.

Research Question 1: What is the level of classroom management factors (discipline, classroom design, communication) in senior secondary schools in Nigeria?

To answer research question 1, Table 8 (a – c) will be used.

Table 8a Descriptive Statistics on Classroom Discipline

Items	N	\bar{x}	Std. Dev.	R
1. Teachers involve students in establishing rules and procedures	6349	3.2978	.71748	HE
2. Teachers share with students the reasons behind the disciplinary approaches used	6349	3.4072	.62962	HE
3. Teachers make students aware of consequences for misbehavior (e.g. loss of break time, extra classroom time)	6349	3.2128	.72466	HE
4. Teachers ignore misbehavior that is non-disruptive to class	6349	3.0083	.90023	HE
Average Total	6349	3.232	.743	HE

R: Remarks; VHE: Very High Extent (3.50 and above); HE: High Extent (3.00 – 3.49); ME: Moderate Extent (2.50 – 2.99); LE: Low Extent (Below 2.50)

Source: Fieldwork, 2021

Table 8a showed that each of items 1 to 4 on the level of classroom discipline in classroom management obtained a mean score above 2.50. The above results implied that the respondents rated the influence of classroom discipline on science teachers and students as high. The grand mean score was **3.232**,

which was above the criterion of **2.50** set for the study, while the standard deviation was **0.743**, indicating that the respondents were not far from the mean and from one another in their responses. Also, the table revealed that item 2 had the highest mean of **3.4072** while the least mean was that of item 4 with a mean score of **3.0083**. This result implies that the grand mean score of **3.232** indicated that the level of classroom discipline on science teachers and students in secondary schools in Nigeria is on a high extent. Therefore, the level of classroom discipline on science teachers and students in secondary schools in Nigeria is on a high extent with the grand mean score of **3.232**.

Table 8b Descriptive Statistics on Classroom Design

Items		N	\bar{x}	Std. Dev.	R
1.	Teachers use different types of seating arrangements depending on the type of activity students are assigned to do	6349	3.2364	.67778	HE
2.	Classrooms have enough desk space for classroom activities	6349	3.1849	.71386	HE
3.	Classrooms are fitted with an appropriate level of classroom technology for the course material	6349	3.1950	.76845	HE
4.	The lightning in the classroom is appropriate during classes	6349	3.1649	.77211	HE
5.	Noise coming from outside of the classroom is often a problem in class	6349	3.2281	.68190	HE
Average Total		6349	3.202	.723	HE

R: Remarks; VHE: Very High Extent (3.50 and above); HE: High Extent (3.00 – 3.49); ME: Moderate Extent (2.50 – 2.99); LE: Low Extent (Below 2.50)

Source: Fieldwork, 2021

Table 8b showed that each of items 1 to 5 on the level of classroom design in classroom management obtained a mean score above 2.50. The above results implied that the respondents rated the influence of classroom design on science teachers and students as high. The grand mean score was **3.202**, which was above the criterion of **2.50** set for the study, while the standard deviation was **0.723**, indicating that the respondents were not far from the mean and from one another in their responses. Also, the table revealed that item 1 had the highest mean of **3.2364** while the least mean was that of item 4 with a mean score of **3.1649**. This result implies that the grand mean score of **3.202** indicated that the level of classroom design on science teachers and students in secondary schools in Nigeria is on a high extent. Therefore, the level of classroom design on science teachers and students in secondary schools in Nigeria is on a high extent with the grand mean score of **3.202**.

Table 8c Descriptive Statistics on Classroom Communication

Items		N	\bar{x}	Std. Dev.	R
1.	Students are always highly motivated to learn when they communicate their thoughts with teachers	6349	3.2293	.60974	HE
2.	Teachers are always very patient while listening to the thoughts of students	6349	3.0783	.66249	HE
3.	Students sometimes have difficulty seeing the instructional materials displayed in the classroom	6349	3.1110	.77540	HE
4.	Students exchange ideas freely with teachers during lessons	6349	2.9551	.87788	ME
5.	Teachers create an environment in the class where students can easily ask questions	6349	3.3927	.73379	HE
6.	Teachers take into account different learning/communication styles of students when preparing for lessons	6349	3.2945	.71433	HE
7.	The layout in the classroom is suitable for teachers' ways of teaching	6349	3.1578	.70954	HE
8.	Teachers explain the meaning of concepts that students do not understand	6349	3.3440	.71185	HE
Average Total		6349	3.195	.724	HE

R: Remarks; VHE: Very High Extent (3.50 and above); HE: High Extent (3.00 – 3.49); ME: Moderate Extent (2.50 – 2.99); LE: Low Extent (Below 2.50)

Source: Fieldwork, 2021

Table 8c showed that each of items 1 to 8 on the level of classroom communication in classroom management obtained a mean score above 2.50. The above results implied that the respondents rated the influence of classroom communication on science teachers and students as high. The grand mean score was **3.195**, which was above the criterion of **2.50** set for the study, while the standard deviation was **0.724**, indicating that the respondents were not far from the mean and from one another in their responses. Also, the table revealed that item 5 had the highest mean of **3.3927** while the least mean was that of item 4 with a mean score of **2.9551**. This result implies that the grand mean score of **3.195** indicated that the level of classroom communication on science teachers and students in secondary schools in Nigeria is on a high extent. Therefore, the level of classroom communication on science teachers and students in secondary schools in Nigeria is on a high extent with the grand mean score of **3.195**.

Thus, the level of discipline, classroom design and communication in classroom management in senior secondary schools in Nigeria is on a high extent.

Research Question 2: What are the preferred teaching style (expert, formal authority, personal model, facilitator and delegator) among science teachers in senior secondary schools in Nigeria?

Table 9 would be used to answer research question 4

Table 9 Descriptive Statistics on Preferred Teaching Style of Science Teachers

Teaching Styles		N	\bar{x}	Std. Dev.
1.	Expert/Formal Authority	6349	28.3854	5.10269
2.	Personal Model/Expert/Formal Authority	6349	25.0599	4.29081
3.	Facilitator/Personal Model/Expert	6349	22.5593	3.4599
4.	Delegator/Facilitator/Expert	6349	25.3619	4.04025

R: Remarks; VHE: Very High Extent (3.50 and above); HE: High Extent (3.00 – 3.49); ME: Moderate Extent (2.50 – 2.99); LE: Low Extent (Below 2.50)

Source: Fieldwork, 2021

The mean was used in adjudging the distribution of preferred teaching styles of science teachers in senior secondary schools in Nigeria. Table 9 above revealed that the most preferred teaching style of science teachers is Expert/formal Authority with a mean score of **28.3854**. The second preferred teaching style was Delegator/Facilitator/Expert with a mean score of **25.3619**, followed by Facilitator/Personal Model/Expert with a mean score of **25.0599**. The least preferred teaching style was Facilitator/Personal Model/Expert with a mean score of **22.5593**.

Hypotheses

The hypotheses tested below were used to establish whether the independent variables of high stakes tests and classroom management have significant relationship with teaching styles of teachers and students' attitude to learning science. This was done using multiple regression and analysis of variance (ANOVA) at .05 level of significance. The correlation matrix of the variables was first presented in a table to reveal the degree of inter-correlation among the independent variables in the study. The opinions of science teachers and students were equally tested using t-test to know whether there are significant differences or not in the opinions/responses.

Table 10: Correlation Matrix of Independent and Dependent Variables

Independent Variables	Discipline	Classroom design	Comm.	Teaching Styles
Discipline	1.00	.564*	.248*	.365*
Classroom Design		1.00	.332*	-.029*
Communication			1.00	.167*
Teaching Styles				1.00

Regression

H₀1: There will be no significant composite influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.

Summary of regression on classroom management factors on teaching styles of science teachers

Table 11a Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate	Change Statistics				
					R ² Change	F Change	df1	df2	Sig. F Ch.
1	.470 ^a	.220	.220	16.13007	.220	897.557	1	6347	.000

a. Predictors: (Constant), Classroom Management

Table 11b Summary Table of ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.	Remarks
Regression	467051.197	1	233525.598	897.557	.000 ^b	Significant
Residual	1651096.11	6347	260.179			
Total	2118147.31	6348				

a. Dependent Variable: Teaching Styles of Science Teachers

b. Predictors: (Constant), Classroom Management

Source: Fieldwork, 2021

Table 11b shows the regression correlation (R) among classroom management factors and teaching styles of teachers in senior secondary schools in Nigeria. The results show that the regression correlation (R) is **.470**, R square equals **.220** and Adjusted R square equals **.220**. This implied that the combination of the independent variable factors contributed **22.0%** to the variation in teaching styles of science teachers in senior secondary schools in Nigeria.

Further verification using analysis of variance (ANOVA) produced $F_{(1, 6347)}$ equals 897.557; $p < .05$. This implied that the linear relationship among the combined variables and teaching styles of teachers is significant. This also means that there is a significant composite relationship factors of the independent variables of classroom management on the teaching styles of science teachers in senior secondary schools in Nigeria.

H₀2: There will be no significant relative influence of classroom management factors (discipline, classroom design, communication) on teaching styles of science teachers in senior secondary schools in Nigeria.

Table 12 Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
	B	Std. Error	Beta			Lower Bound	Upper Bound
(Constant)	55.133	1.553		35.500	.000	-5.94908	-3.31660
Classroom Management	-.520	.025	-.265	-20.974	.000	-2.81927	-1.47595

a. Dependent Variable: Teaching Styles of Science Teachers

Source: Fieldwork, 2021

Table 12 presents the coefficients that indicate the relationship between each of the factors of classroom management and teaching style of science teachers in senior secondary schools in Nigeria. The results show contribution of the variables' factors indicated by standardized Beta (B) weights in order of magnitude; classroom management contributed to teaching styles of teachers with **B=-.265**, **t=-20.974**; $p < .05$. The analysis of the result shows that the independent variables of classroom management have significant relationship with the teaching styles of science teachers.

H₀3: There will be no significant mean difference between the opinions of teachers and students with regards to classroom management factors in senior secondary schools in Nigeria.

The independent sample t-test was used in testing the opinions of teachers and students regarding classroom management in senior secondary schools in Nigeria.

Table 13a Group Statistics on Classroom Management

Respondents' Status	N	Mean \bar{x}	Std. Deviation	Std. Error
Students	5501	53.5352	9.45855	.12753
Classroom Management Teachers	848	55.6828	8.08643	.27769

Table 13b Summary Table of Independent Sample t-test on Classroom Management

	Levene's Test		t-test for Equality of Means			Decision	Remarks
	F	Sig.	t	df	Sig. (2-tailed)		
Equal Variances Assumed	45.363	.000	-6.268	6347	.000	Accept	Not sig.
Classroom Management Equal Variances Not Assumed			-7.028	1233.501	.000		

From table 13 above, the mean difference in the opinions of teachers and students regarding classroom management were higher for teachers ($M=55.6828$, $SD=8.08643$) than students ($M=53.5352$, $SD=9.45855$), $t_{(6347)} = -6.268$, $p>.05$. Levene's test indicated equal variance assumed ($F=45.363$, $p=.000$). Thus, it is not significant. The null hypothesis of no significant mean difference in the opinions of teachers and students with regards to classroom management in senior secondary schools in Nigeria is therefore upheld. Thus, there is no significant mean difference in the opinions of teachers and students regarding classroom management in senior secondary schools in Nigeria.

IV. Discussion of Findings

This section presents discussion on the findings of the study with respect to the influence classroom management on teaching styles of teachers in senior secondary schools in Nigeria.

The hypothesis, which sought the significant composite influence of classroom management on the teaching styles of science teachers in senior secondary schools in Nigeria, revealed that there existed a composite influence of all the variables on teaching styles of science teachers in senior secondary schools in Nigeria. From result of hypothesis one, it was clear that significant composite influence of all the factors of the independent variable on teaching styles existed. This means that the factors of classroom management jointly influence teaching styles of science teachers in senior secondary schools. This is in line with an author who posited that various factors such as examinations and classroom management go a long way in influencing the choice of teaching style of a teacher (MyFreeSchool, 2014).

The analysis of hypothesis two which sought the significant relative influence of classroom management factors on teaching styles revealed that it existed. This means that classroom management factors have singular influence on the teaching styles of science teachers in senior secondary schools in Nigeria. This is consistent with scholars who have reported views on classroom management factors having positive relationship with teaching styles of teachers (Willian, 2016; Egeberg, 2021). It has also been reported that, even though often overlooked, the number one classroom management element that influences the way teachers teach is the classroom design (Willian, 2016).

Analysis of hypothesis three which sought the opinions of respondents regarding classroom management in senior secondary schools in Nigeria, revealed that the majority of the respondents agreed that classroom management also impacts the teaching and learning process in senior secondary schools in Nigeria. This is supported by a particular study that described the classroom as both a physical and decision-making unit for the teacher as well as for the students and so management of the classroom environment can influence both users (Boniface, 2018). Another group of researchers came with findings that classroom management components including classroom size, classroom design and classroom discipline have significant influence on the instructional process of classrooms (Ajayi *et al.*, 2017). In a study by yet another group of scholars, it was again reported that classroom management is one of the most neglected areas in secondary schools, relating the success or failure of any teaching and learning process to the way the classroom is managed (Omenka and Etor, 2015).

V. Conclusion

Classroom management factors are critical to the success and progress of the teaching and learning process in both developed and developing countries, including Nigeria. On the basis of these research findings, the study has proven that the classroom management has a strong relationship with the teaching styles of teachers in senior secondary schools in Nigeria. It was observed that even though mostly neglected, classroom management plays a significant role in the successful teaching and learning process in classrooms. From the analysis and results of the findings, it could be concluded that students tend to develop a positive attitude towards learning science, when the learning environment is conducive. It can also be concluded that students generally have interest in science, even though some find science activities a bit challenging.

VI. Recommendations

Classroom management systems are put in place to increase student success by creating an orderly learning environment that enhances students' academic skills and competencies, as well as their social and emotional development. In this regard, and based on the findings highlighted earlier, the researcher wishes to make the following recommendation.

i. Much consideration needs to be taken into account when developing guidance and classroom management. Positive environments are created through appropriate psychosocial aspects and physical attention of the teacher towards students. It is possible for teachers having the students wanting to learn and it is possible to create an appropriate classroom behavior and management system. However, without structure in daily routines, students are left to stray from appropriate learning activities. With discipline and appropriate classroom design, a positive learning environment and structure, the student and the teacher will benefit as a whole.

Suggestions for Further Studies

Based on the findings and conclusion of this study, and the fact that the study did not cover all aspects, the following suggestions were made for further studies in the resulting areas.

i. There is need for more research focusing on knowledge and skills of teachers in terms of managing their classrooms effectively and modifying instruction that could enhance learning opportunities for all students with their varying learning abilities.

References

- [1]. Balachandran Tharanky. "Why Teachers Teach the Way They Do: Factors Influencing the Perceptual Teaching Styles Of Teacher Candidates in Math Education". (PhD diss., Ontario Institute for Studies in Education of the University of Toronto, 2015)
- [2]. Blazar David. "Teacher and teaching Effects on Students' Academic Performance, Attitudes and Behaviors". (PhD diss., Harvard Graduate School of Education, 2016)
- [3]. Boniface Ugwumaduka. "Classroom environment and academic interest as correlates of achievement in senior secondary school chemistry in Ibadan south West local government area, Oyo state, Nigeria". *Global Journal of Educational research*, (2018)
- [4]. Dev Willian. (2016) "*How Classroom Design Affects Learning*", Connecting Elements [online] Available at: <https://www.connectingelements.com/OUR-BLOG/how-classroom-design-affects-learning> [accessed 23 July 2020].
- [5]. Egeberg, H., McConney, A. & Price, A. Teachers' views on effective classroom management: a mixed-methods investigation in Western Australian high schools. *Educ Res Policy Prac* 20, 107–124 (2021)
- [6]. Esme Hacieminoglu. "Elementary School Students' Attitude Toward Science and related Variables". *International Journal of Environmental and Science Education*, (2016), 11(2), pp. 35-52
- [7]. Hamidu-Armah and David Robson. "Applying Theory of Planned Behavior Model on Studying Teachers' Change in Mathematics Instruction". *African Journal of Educational Studies in Mathematics and Sciences*, **15**, (2019), pp. 117-133
- [8]. Imran Latif, Lubna Salamat, Mohammad Ifikhar and Muzaffar Hussain. "The Impact of Classroom Management Strategies on the Students' Achievement". *Asian Journal of Social Sciences and Humanities* 2(2); (2018): pp. 13 – 27.
- [9]. Iqbal Shah and Muhammad Khan. "Impact of Multimedia-aided Teaching on Students' Academic Achievement and Attitude at Elementary Level". *US-China Education Review*, 5(5); (2015) pp. 349 - 360
- [10]. Janelle Cox. "Classroom Management for an Effective Learning Environment". *Teach Hub*, (2019)
- [11]. Joshua Adeolu. "Teachers' classroom management and quality assurance of students' learning outcome in secondary schools in Ondo State, Nigeria". *Journal of Social and Administrative Sciences*, 4(2), (2017): pp. 166 – 180
- [12]. Kirsi Pyhalto, Janne Pietarinen and Tiina Soini. Teacher burnout profiles and proactive strategies. *European Journal of Psychology of Education*, (2020), pp. 1 – 19
- [13]. My Free School Tanzania (2014). Factors that determine the choice method to be used in teaching history. Retrieved from <http://myfreeschooltanzania.blogspot.com/2014/08/factors-that-determine-choice-method-to.html> on 11th June, 2021.
- [14]. Nicholas Omenka and Eriba Otor. "Influence of Classroom Management on Students' Academic Achievement in Science and Mathematics in Oju Local Government Area of Benue State". *Global Journal of Interdisciplinary Social Sciences*, 4(4), (2015), pp 36 – 40
- [15]. OECD. OECD Science, Technology and Innovation Outlook 2016, OECD Publishing, Paris, https://doi.org/10.1787/sti_in_outlook-2016-en
- [16]. Oluwatosin Victor Ajayi, Christina Tanko Audu and Evelyn Ehi Ajayi. "Influence of class size on students' classroom discipline, engagement and communication: a case study of senior secondary schools in Ekiti state, Nigeria". *Sky Journal of Educational Research*, 5(5), (2017), pp. 34 – 041
- [17]. Valentine Owan, Bassey Bassey and Daniel Clement. "Path Analytic Study of Factors Affecting Students' Attitude towards Test-Taking in Secondary Schools in Afikpo Education Zone, Ebonyi State, Nigeria". *American Journal of Creative Education*, 3(1), (2020), pp. 10 – 20

Appendix 1

Questionnaire for Students and Teachers

Dear Respondent,

This questionnaire with the title – **Classroom Management and Teaching Styles Questionnaire (CMTSQ)** – is designed to find out the influence of classroom management on the teaching styles of teachers in senior secondary schools in Nigeria. Your personal and honest response is of utmost importance to the study, and

7	Students describe teachers as a "storehouse of knowledge" who dispense the fact, principles, and concepts they need.				
8	Facts, concepts, and principles are the most important things that students are to acquire.				
9	What teachers have to say about a topic is important for students to acquire a broader perspective on the issues in that area.				

Personal Model/Expert/Formal Authority

S/N	Item	SA	A	D	SD
1	Teachers typically show students how and what to do in order to master course content.				
2	Examples from personal experiences of teachers often are used to illustrate points about the material.				
3	Students take responsibility for teaching part of the classroom lessons.				
4	Teachers sharing knowledge and expertise with students is very important to them.				
5	Teachers' expertise is typically used to resolve disagreements about content issues.				
6	Eventually, many students begin to think like teachers about course content.				
7	Teachers give students a lot of personal support and encouragement to do well in courses.				
8	Teachers give students frequent verbal and/or written comments on their performance.				

Facilitator/Personal Model/Expert

S/N	Item	SA 4	A 3	D 2	SD 1
1	What teachers say and do models appropriate ways for students to think about issues in the content.				
2	Teachers employ small group discussions to help students develop their ability to think critically.				
3	Teachers allow students set their own pace for completing independent and/or group projects.				
4	Students describe teachers as "instructors" who work closely with students to correct problems in how they think and behave.				
5	Teachers provide avenue for students to design one or more self-directed learning experiences.				
6	Teachers guide students' work on course projects by asking questions, exploring options, and suggesting alternative ways to do things.				
7	Teachers often show students how they can use various principles and concepts.				

Delegator/Facilitator/Expert

S/N	Item	SA 4	A 3	D 2	SD 1
1	Teachers encourage activities in class in order to help students develop their own ideas about content issues.				
2	Teachers spend time consulting with students on how to improve their work on individual and/or group projects.				
3	Teachers want students to leave courses well prepared for further work in related areas.				
4	Teachers provide very clear guidelines for how they want tasks completed in courses.				
5	Teachers setup course activities that encourage students to take initiative and responsibility for their learning.				
6	Teachers solicit students' advice about how and what to teach in courses.				
7	Teachers assume the role of a resource person who is available to students whenever they need help.				
8	Teachers structure classroom activities that develop the ability of students to think and work independently.				

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