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Science Teachers' Level of Pedagogical Skills and Classroom Management Competencies as correlates of Students' Interest in Biology

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Abstract:
Students' low interest in Biology has been evidenced through their performances in both termly and final examinations. A lot of factors such as teachers' pedagogical skills and classroom management competences could be responsible. The aim of the study was to review and analyse the relationship between teachers' pedagogical skills, classroom management competences and students' interest in biology. There were 2 research questions and corresponding hypotheses. Data collection was through questionnaires which were designed by the researchers after extensive literature review. The data were analyzed using mean and standard deviation to answer research questions while ANOVA was employed to test the two formulated hypotheses. The findings of the analysis revealed a moderate positive relationship between teachers' pedagogical skills, classroom management competencies on students' interest in Biology. Some recommendations were made based on the findings of the study.

Keywords: *Science teachers, pedagogical skills, classroom management competences, interest, Biology*

1. Introduction

The style a teacher adopts in teaching any subject is in no doubt a major vehicle through which instructions are driven and successes achieved in the classroom. The style or art of teaching describes the pedagogical skills. Kenklies (2012) defines pedagogical skills as the discipline that deals with the theory and practice of teaching. In the same light, Leach and Moon (2009) define pedagogical skills as the practice that a teacher, together with a particular group of learners creates, enacts and experiences. However, a teacher with pedagogical skills demonstrates unique qualities which Babalola (2012) identifies in his work as: adequate knowledge of the subject matter so as to provide accurate information to students; suitable academic qualification; effective communication style for delivery of instruction. All these characteristics set the pace for an atmosphere for effective interest in learning. The importance of pedagogical skills is evident in Clark (2012) and Borg (2013) assertions that pedagogical skill is one of the determinants of students' interest and academic achievement especially in science related subjects such as Biology.

Biology is taught to enable students apply scientific knowledge to everyday life in matters of personal and community health, agriculture and a functional scientific attitude (Baja, 2010). Since science subjects including Biology are content specific learning, this should guide the teacher as he or she teaches students any module of the content in class (Aina & Adedo, 2013) because students' interest and positive academic outcome in Biology is linked to pedagogical skills, Borg (2013) further notes. Such pedagogical skills involve motivating students, giving positive reinforcement, allocating more time for preparation and delivery, and teaching with effective classroom materials by integrating technology, making conscious effort to link instructional materials with content and demonstrating the willingness to provide immediate feedback. In addition, and more specific, effective teaching in biology, Khatoon, Alam, Bukhari, and Mushtaq, (2014) states that it requires positive skills in lesson preparation and lesson planning such as, possessing skill in arousing curiosity in students; ability to link lesson with past experience; ability to define problem (topic) in simple language and using of daily life examples.

The teacher who has good pedagogical skills is also expected to be competent in classroom management which Umoren (2010), states to include all the things teachers must do in the classroom to foster students' academic involvement and cooperation in classroom activities to create conducive learning environment. Akinbobola (2004) lists,

good classroom control, effective communication skills, enthusiasm for teaching as components of classroom management competencies. Both skills are essentially required in the teaching profession leading to students' interest and achievement in science subjects, (Trinder, 2008).

Unfortunately, Aina, (2012) and Ezekannagha (2008) confirm that there are many unqualified science teachers in secondary schools in Nigeria. In addition, Okoli and Abonyi (2014) collaborate that most biology teachers are pre-occupied with verbal instructions (through lecturing, exposition, discussions, and questioning) and neglect concrete sensory experiences which give meaning to words. The problem is not only in Nigeria but outside Nigeria, where the study of Laguatan and Abad (2019) reveal that this shortfall leads to learning of science subjects through memorization and rote learning. Pedagogical skills require the ability of the teacher to engage the students in learning biology with the best teaching approaches, contrary to this, is low interest and poor achievement in biology. The preference of biology to other science subjects, poor concentration and participation in class activities as well as poor achievement in biology according to WAEC Chief Examiners report (2017, 2018 and 2019), could be pointers that teachers are not doing their best in this subject area. It is based on this premise that the researchers seek to find science teachers' level of pedagogical skills and classroom management competencies as correlates of students' interest in biology.

1.1. Objectives of the Study

The general objective of the study was to determine science teachers' level of pedagogical skills and classroom management competencies as correlates with students' interest in biology

- Determine the relationship between science teachers' pedagogical skills and students' interest in Biology.
- Determine the relationship between science teachers' classroom management and students' interest in Biology.

1.2. Research Questions and Hypotheses

The following research questions were raised to guide the study:

What is the relationship between science teachers' pedagogical skills and students' interest in Biology?

What is the relationship between science teachers 'classroom management competencies and students' interest in Biology?

The two null hypotheses were formulated and tested at 0.05 level of significance:

- $H0_1$ Teachers' pedagogical skills do not determine students' interest in Biology.
- $H0_2$ Teachers' classroom management competencies do not determine students' interest in Biology.

2. Methodology

The population of the study comprised of 4,110 students (2,776 females and 1,334 males) that offered Biology from the 44 senior secondary schools in Obollo-Afor Education Zone. This consisted of 1,807 students in 20 public secondary schools in Igbo-Eze North, 911 students in 10 public secondary schools in Igbo-Eze South and 1,392 in 16 public secondary schools in Udenu Local Government Area of Enugu State

The instrument for data collection was a researcher developed instrument titled Teachers' Pedagogical Skills and Management competencies and Student's Interest in Biology Questionnaires (TPSMCIABQ) with three clusters. Cluster A was on Teachers' pedagogical skills and consisted of 14 items; cluster B was on classroom management competencies and consisted of 14 items while cluster C elicited information on students' interest in Biology and consisted of 10 item questions. All the items were rated on a four-point rating scale of Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Disagree (SD) and weighted 4,3,2 and 1, respectively. The instruments were distributed to the sampled students in the selected secondary schools. This was done with the permission of the school principals and the teachers who served as research assistants. The questionnaires were retrieved on the spot to ensure maximum compliance and return. At the end of the distribution which lasted for one week, all were assembled and submitted for analysis.

3. Results

- Research Question 1: What is the relationship between teachers' pedagogical skills and students' interest in Biology?

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.342[a]	.117	.113	.41921
a. Predictors: (Constant), Pedagogical Skills				

Table 1: Mean Responses of Students on the Relationship between Teachers' Pedagogical Skills and Students' Interest in Biology

Data in Table 1 indicate that the correlation coefficient between teachers' pedagogical skills and students' interest in Biology is 0.342 with a coefficient of determination of 0.117. This shows that there is a positive relationship between teachers' pedagogical skills and students' interest in Biology. The coefficient of determination of 0.117 means that 11.7% variation in students' interest in Biology is attributed to teachers' pedagogical skills.

- Research question 2: What is the relationship between the classroom management competencies and students' interest in Biology?

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.291[a]	.085	.081	.42896
a. Predictors: (Constant), Pedagogical Skills				

Table 2: Mean Responses of Students on the Relationship between the Classrooms Management Competencies and Students' Interest in Biology

Data in Table 2 indicate that the correlation coefficient between the classroom management competencies and students' interest in Biology is 0.249 with a coefficient of determination of 0.062. This shows that there is a positive relationship between the classroom management competencies and students' interest in Biology. The coefficient of determination of 0.062 means that 06.2% variation in classroom management competencies is attributed to students' interest in Biology.

4. Research Hypotheses

- Ho_1: There is no significance influence of pedagogical skills of Biology teachers on students' interest in Biology

The information supplied in the questionnaires were subjected to ANOVA to determine the formulated Hypothesis one. Summary of the result is presented in table 3

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.772	1	5.772	32.843	.000[b]
	Residual	43.584	248	.176		
	Total	49.356	249			
a. Dependent Variable: Students Interest						
b. Predictors: (Constant), Pedagogical Skills						

Table 3: Anovaa on the Significance of Teachers' Pedagogical Skills on Students' Interest in Biology

Table 3 shows that teachers' pedagogical skills had significant relationship with students' interest in Biology, F (1, 248) = 32.843, p=0.000.

Since the P-value of 0.000 is less than the 0.05 level of significance, the null hypothesis was rejected.

- Ho_2: There is no significant influence of classroom management competence of Biology teachers on students' interest in Biology

Data collected were used to test hypothesis two using ANOVA and the result is presented in table 4 below.

Model		S78um of Squares	Df	Mean Square	F	Sig.
1	Regression	4.220	1	4.220	22.931	.000[b]
	Residual	45.634	248	.184		
	Total	49.853	249			

Table 4: Anova[a] on the Significance of Teachers' Classroom Management Competence on Students' Interest in Biology

Table 4 shows that classroom management competencies had a significant relationship with students' interest in Biology, F(1,248) = 16.359, p=0.00.

Since the p-value of 0.000 is less than 0.05 level of significance, the null hypothesis was rejected.

5. Discussion

The results of this study reveal that there is a moderate positive influence of pedagogical skills on students' interest in Biology. This finding is in line with Yadi, Umasih, and Abdul (2020) and Onu, Anyaegbunam and Uzoigwe (2020) whose studies found a significant relationship between pedagogical skills and students' interest in History and Biology subjects respectively. The findings then suggest that when Biology teachers define problems in simple languages, explain clearly, what will be presented, use daily life examples, link concrete and abstract experiences, allow students ask clear questions pertaining what has been taught and give assignment pertaining to the topic discussed. Students' interest will be aroused. This means that adequate pedagogical skills could imply increase in the interest of students in Biology.

This study also reveals that there is positive but low influence of classroom management competencies on students' interest in Biology. The finding of the study is in line with Lawyer (2019) and Okeke (2019) whose studies reveal that there is a positive influence of classroom management competencies on students' interest and achievement in science related subjects. Garner (2007), also supports the finding that the more classroom management competencies by the teacher, the more interest among the students. How, the teacher manages his or her class enhances students' interest. That is, teachers' effective application and adaptation of certain professional skills in the handling of Biology lessons make wider impact on students' ability to be enthused. At that, it is obvious that when teachers have good classroom control, effective communication skills, and friendly, regularly reinforces and gives feedback, the interests of students are aroused, sustained and thus perform better during examination.

6. Conclusion and Recommendations

Teachers' pedagogical skills and classroom management competence have been found to have influence on student's interest in learning Biology. The educational implication of these findings is that efforts should be made by Government to ensure that teachers with adequate pedagogical skills are recruited to handle science subjects and consider pedagogical skills as part of aptitude test when recruiting teachers in secondary schools especially in Biology and constantly ensure teachers receive in-service training on classroom management skills. This to promote continued effective delivery of Biology instructions as well as promote students' interest.

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