PERCEPTION OF TEACHERS' MOTIVATIONAL VARIABLES AND STUDENTS' ACADEMIC ACHIEVEMENT IN BIOLOGY IN AKWA IBOM STATE, NIGERIA

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Abstract

This study centered on perception of teachers' motivational variables and senior secondary one students' academic achievement in Biology in Abak Local Government Area of Akwa Ibom State. The Quasi Experimental design was used for the study. Four research questions and four corresponding hypotheses were formulated. The study adopted the ex-post facto research design. The population consisted of three thousand six hundred and twenty nine students from eleven public secondary school in Abak Local Government Area of Akwa Ibom State. A sample size of two hundred and twenty five students was randomly selected from the eleven public secondary schools in Abak Local Government Area. A structured questionnaire was used to obtain data on the independent variables while data on students' academic achievement was obtained from the Biology Achievement Test (BAT); To test the hypotheses, independent t-test analysis was employed. The findings revealed that there is significant influence of teachers timely correction of students' work and use of instructional materials on students' academic achievement in Biology based on teachers' timely correction of students' work and teachers' use of instructional material. It was recommended that teachers should use motivational strategies effectively in secondary schools to enhance students' academic achievement.

Keyword: Perception, Teachers' Motivational Variables, Academic Achievement, Biology

Introduction

Teaching is the process of transmitting knowledge and skills to the learners. The teacher is generally seen as one who directs the affairs of a class to bring a desired change. For a teacher to properly do this, he needs to be competent in his own area of specialization and acquire the techniques of carrying every student along during the teaching and learning process. The teachers' job is multi-dimensional; paramount among his distress is that of creating adequate conditions for motivating and supporting learning (Cassell, 2019). This is because the success of any system and education depend on the quality of its teachers. According to Weaver (2019) the validity of any educational system generally is dependent upon the quality of teaching. It is ultimately the teacher who decides on what goes on in the classroom and transfers educational theories into practice.

Owing to this, there is need to focus on students' motivation inside and outside the classroom for improvement in Biology in Secondary Schools. Both teachers and learners must be active during the process of teaching. The learner learns through some activities while the teacher does all he considers necessary to make the learning possible. Wilson (2016) posited that teaching is the art of systematically presenting stimuli. What this means is that unless a situation

is created for learning to take place as a result of some efforts, the effort cannot be referred to as teaching.

According to Yarnell and Bohrnstedt (2018), for effective learning to take place, the teacher must first of all arouse the interest of the learners in the subject he intends to teach. Such tendency is motivation. Motivation of students' interest must always precede teaching since this arousal will prepare learners mind in attending to what is to be taught. In the teaching of Biology in Secondary Schools, a student should be motivated by the teacher through the use of instructional materials as their motivational variables, students use these learned behaviors to attempt similar and curiosity. The source also opined that students learn by doing, making writing, designing, creating and solving problems. Springer, Ballou and Peng (2014) looked at motivation as something that stimulates the interest of somebody; to cause somebody to do something. Pham, Nguyen and Springer, (2020) maintained that motivation is the arousal of interest. The speed or Vigour in which the learner is motivated towards a successful goal can be seen by his level of persistence in performing the task.

Partelow, Spong, Brown and Johnson (2017) defined motivation as all those inner striving conditions described as wishes, desires, urges that stimulates the interest of a person in an activity. It is therefore an inner state that stimulates and triggers behavior. The relative incidence of specific behavior such as teaching and learning, discipline and control in schools could be under mind if teachers and students were not motivated. Sparks (2016) referred to it as an intervening variable, while Ntobeko (2018) identified it as an intervening and psychological process that were not directly observable but which in turn accounted for behavior.

Noddings (2017) observed that motivation is a term used to describe those processes both initiative and rational by which people seek to satisfy the basic drives, perceived needs and personal goals which trigger of human behavior. Newland, DeCino, Mourlam and Strouse (2019) define motivation as the arousal of tendency to act to produce one or more effort. Cassell (2019) spoke of motivation as the tendency to expand effort in order to achieve a set goal or goals. And to Pham, Nguyen and Springer (2020), motivation may be defined more formally as a psychological or internal process, initiated by some needs which lead to activity that will satisfy the need. According to behavioral psychologists, there can be no motivation without a goal. Generally speaking, the more successful one will be in attaining it, although myraid factors such as individuals' temperament, upbringing and self image may intervene (Chappuis, Stiggins, Chappuis & Arter 2020).

Cognitive psychologists have found out that a motive sensitizes the person in cognitive areas related to the motive. Someone with a high need for achievement tends to recognize achievement-related words quickly when they are flashed on a screen. Present researches on students' motivation have been centered on the classroom where majority of learning take place and where students are more likely to acquire a strong motivation to gain new knowledge. Making the classroom a place that naturally motivates students to learn is much easier when students and teachers function in an atmosphere where academic success and motivation are expected and rewarded (Newland, DeCino, Mourlam & Strouse, 2019).

Moreso, situation where motivation to learn evolves into academic achievement is a characteristics of an effective school. An environment that nurtures education motivation can be cultivated in the home, classroom or throughout the entire school. As pointed out by Golob and Makarovič (2018), the multiple social systems that young people participate in having ecological relation to each other, development at home may lead to changes in the students' behaviors. High academic achievement is mostly likely when schools, homes and communities contribute to student's ability, willingness and opportunities to invest in education. He concluded; it is true that academic failure is most likely when a student has few or no source of encouragement, practical support and educational opportunities. Teachers can influence students' level of motivation by shaping the school instructional climate which in turn shapes the attitude of teachers, parents and the community at large toward education. The classroom climate is

important, Hanushek, Piopiunik and Wiederhold (2018) stressed that "what take place in the classroom is critical but classroom is not an Island". Therefore to support motivation to learn, school level policies and practices should stress learning, task mastery and effort rather than relative performance and competition.

Once a learner's interest in Biology has been aroused, he now learns with much seriousness and becomes anxious to test his skills by attempting problems that elicit high cognitive responses. The learned response and proficiency attained as a result of consistently, conscientiously acquired skills, exhibited good achievement that meets the approval of his teacher. Hanushek and Woessmann (2017) noted that a good achievement of a task at hand in Biology is ensured only on the learner's deep understanding of the concepts and theories relevant to the task, but where the facts of the instruction are not well grasped by the learner, a not too good performance will be expected. He in his findings on motivation-performance, achievement contracts' that influence teaching and learning observed that performance was always high in the class that students were motivated through many worked examples. For a good achievement, a well motivated competency level must have been acquired by the learner during class instruction in Biology.

Gershenson (2016) study echoed the belief that learning at all levels is hampered when teachers do not motivate and know their students well enough to support their learning. The student themselves considered their own intellectual strengths irrelevant to their success in school. Teachers should expose students to many diffident motivational variables including feedback and worked examples. Mastery of skills to attain a competency level should be emphasize and vigorously pursued during class instruction a panacea for improved achievement. The modern trends in education and the complex nature of learning and instruction have made the role of the teacher more challenging. This new roles not just involve the mere transmission of information to students but also involve looking at the problems associated with learning and instruction especially with instructional materials which can motivate the learner in concretizing concepts taught (Duru, Uko & Uduak, 2024).

The accomplishment realization of these important educational goals in Nigeria lies in the new trend in educational approaches. To this end, different ways of teaching and learning have emerged emphasis tends to shift from teacher-centered to student-centered educational approaches. These new approaches to learning and instruction expose the students to conceptualize and effectively manage their own learning and thus reinforce their transfer, their training into practical situations. This is why Akpan (2018) stated that science education research, innovation and practices must become more responsive to the needs and ambitions of the society and reflect its values.

Egalite, Kisida and Winters (2015), observed that in recent times, education has been a downward trend. This is due to lack of motivation in school system. Teachers themselves need motivation so as to enable them to motivate the students. For a successful work to be done in the school, teachers must use motivational strategies like: timely corrections of students work, the use of instructional materials, among others. Fryer (2013) said that motivation has the ability to change behavior. They defined motivation further as the drive that compels one to act because human behavior is directed towards some goals. Students regain some form of stimulus to achieve much academically. Motivation helps the student to pay much attention in the class learn self recovery, gain independence and promote cordial relationship between teachers and students.

Teachers' motivational variables includes: timely Correction of students' work and teachers' use of instructional materials can enhance high academic achievement in Biology in Abak Local Government Area of Akwa Ibom State.

Statement of the Problem

Many students do not learn effectively and so perform poorly in school test and examinations, not because of their low intellectual ability or inadequacies but lack interest and zeal to pursue the learning task. Teachers attend classes regularly, show high level of punctuality and avoid absenteeism, disengaged in any other side attraction like farm activities, trading and other form of business and respond to the professional duties, but still the performance of students in school are still nothing to ride home about and it raises a question in the mind of both parents and teachers as to what the major problem of this backwardness in students' academic performance. Students submit and emit the image of one who improves knowledge and the physical condition of the classroom through his/her orderliness, discipline, encouragement and control of the classroom. The teacher who is the one that translate educational philosophy and objective into knowledge and skill and transfers them to students in the classroom use the proper motivational variable, Students will achieve maximally in their academics.

Over the years, it has been observed that most teachers show a lack of concern about perceptions of motivational variables that may make or mark performances among students in schools. The result showed widespread examination failure, stubbornness, absenteeism and poor attitude by the students in the school system. The ability to utilize the various perceptions of teachers' motivational variables is related to the learning behavior of the students in any given subject. The question that bothered this study was; to what extent does perception of teachers' motivational variables influence students' academic achievement in puplic secondary schools in Abak Local Government Area.

It was then rational to investigate perception of teachers' motivational variables and students' Academic achievement in Biology in secondary schools in Abak Local Government Areas in Akwa Ibom State, Nigeria.

Purpose of the Study

The study investigated perception of teachers' motivational variables and students' academic achievement in Biology in Abak Local Government Area in Akwa Ibom State, Nigeria. Specifically, the study sought to:

1. determine the influence of students' academic achievement in Biology based on teachers' timely correction of students' work
2. examine the influence of students' academic achievement in Biology based on teachers' use of Instructional materials.

Research Questions

1. What influence does timely correction of students' work make on students' academic achievement in Biology?
2. How does the use of instructional material influence students' academic achievement in Biology?

Hypotheses

The following null hypotheses have been formulated to direct the study

1. There is no significant influence of teachers' timely correction of students' work on secondary school students' academic achievement in Biology.
2. There is no significant influence of use of instructional materials on Biology students' academic achievement in secondary schools.

Method

The study adopted the Ex-post facto research design. The independent sub-variables such as timely corrections and instructional materials are studied retrospectively in order to establish their possible roles and influence on the dependent variable (Student Academic Achievement in Biology). The population of the study comprised of 3629 Biology students in the Senior

Secondary One (SS1) and Biology teachers in 2022/2023 academic session. A sample size of 225 senior secondary I students' drawn from 5 schools out of 11 senior secondary schools in their intact classes through simple random sampling technique was used for the study. The Perception of Teachers Motivational Variables Scale (PTMVS) was used as instrument for data collection. The instrument was duly validated and subjected to reliability analysis using Kuder Richardson 21 (K-R21). The reliability coefficient obtained using the odds versus even data by KR_{21} formula stood at 0.97, for timely correction of students work and 0.90 for teachers' use of instructional materials. Another instrument involved is Biology Achievement Test (BAT). Having pre-tested the (BAT) with randomly selected 40 students of Senior Secondary One (SS1) who were not to participate in the main study, the test were scored. The reliability coefficient using (KR_{21}) formula by first half versus second half data was 0.80. A duration of 30 minutes was allowed for the completion of the perception of teachers' motivational variables instrument; while one hour was allowed for the achievement test on Biology. In administering the perception of teachers' motivational variables instrument on the respondents, the direction has shown why the class master should read aloud as the students read silently. The examiner continued to read each statement while allowing time for the students to rate themselves. The data obtained from the respondents were organized and presented in Tables. Mean and Standard deviation was used to answer the research questions. A cut of mean of 2.5 and above by a respondent was used to specify the response as effective while less than 2.5 was used to specify the response as ineffective. Independent t-test analysis was used to assess the statistical significance of the mean score of achievement test on Biology students by each independent sub variable of the research hypotheses of: timely correction of students work and teachers' use of instructional materials. The significant level of 0.05 was the basis for accepting or rejecting the formulated hypotheses.

Results

Hypothesis One

There is no significant influence of teachers' timely correction of students' work on secondary school students' academic achievement in Biology.

Independent t-test analysis were used in testing hypothesis one as presented in Table 1.

Table 1: Independent t-test analysis of the influence of timely correction of students' work on students' academic achievement in Biology

Timely correction of students' work	N	Mean	SD	Mean difference	t-cal	t-crit	Decision at P<.05
Effective	103	35.65	6.08	17.92	25.63	1.98	Significant
Ineffective	122	22.97	4.51				

*Significant at .05 alpha level, n = 225, df = 223

The result in Table 1 shows if timely correction of students' work significantly influence students' academic achievement in Biology. The result shows that the calculated t-value of 25.63 is greater than the critical t-value of 1.98 at .05 level of significance and 223 degree of freedom. This result is significant; therefore, the null hypothesis which states that there is no significant influence of timely correction of students' work on students' academic achievement in Biology is rejected. Therefore, there is a significant influence of timely correction of students' work on students' academic achievement in Biology as reviewed by this result

Hypothesis Two

There is no significant influence of use of instructional materials on Biology students' academic achievement in secondary schools.

Independent t-test analysis were used in testing hypothesis one as presented in Table 2.

Table 2: Independent t-test analysis of the influence of teacher-student relationship on students' academic achievement in Biology

Use of instructional materials	N	Mean	SD	Mean difference	t-cal	t-crit	Decision at P<.05
Effective	111	34.54	6.51				
				11.38	14.31	1.98	Significant
Ineffective	114	23.16	5.39				

*Significant at .05 alpha level, n = 225, df = 223

The result in Table 2 shows if use of instructional materials significantly influenced students' academic achievement in Biology. The result shows that the calculated t-value of 14.31 is greater than the critical t-value of 1.98 at .05 level of significance and 223 degree of freedom. This result is significant; therefore, the null hypothesis which states that there is no significant influence of use of instructional materials on students' academic achievement in Biology is rejected. Therefore, there is a significant influence of use of instructional materials on students' academic achievement in Biology.

Summary of Findings

The results obtained data analyses were summarized as follows that:

1. There is a significant influence between teachers' timely correction of students' work and senior secondary one students' academic achievement in Biology. It showed that timely correction of students' work was effective in enhancing students' achievement in Biology.
2. There is a significant influence of teachers' use of instructional materials and Senior Secondary One students' academic achievement in Biology. It showed that teachers' use of instructional material was effective in enhancing students' achievement in Biology.

Discussion of Findings

Teachers timely correction of students work and academic achievement in Biology.

Data in table 1 examine teachers timely correction of students work and academic achievement in Biology. Result indicated that timely correction of students' work significantly influence students' academic achievement in Biology. The result shows that students' whose timely corrections of their work was effective for them, have better achievement in Biology than those whose timely corrections of their work is ineffective. From the study it was found out that timely correction of a students work has an effective impact on students' achievement.

This is in agreement with the work of Dulay and Karadag (2017) that the knowledge of prior achievement of students' work is a motivational force in the learning of tasks. Marjoka (2020) opined that feedback is a mechanism that evaluates what the learner had learnt in the period and then brings out results for improvement and progress which ultimately brings about motivation. Skinner applied the idea in constructing the linear teaching programme where the response given by a student is evaluated immediately; this research work is in support that timely corrections provides additional insights into the goals of the learner.

This work is also in consonance with the works of Zhengdon *et al*., (2021) that teacher feedback and student feedback behavior each had significant influence on course satisfaction,

student feedback behavior showed no direct significant effect on course exam results, and teacher feedback also showed no significant indirect influence on course exam results.

Teachers use of instructional material and academic achievement

Data in table 2 examine teachers' use of instructional materials and academic achievement in Biology. Result indicated that teachers use of instructional materials significantly influence students' academic achievement in Biology.

The result shows that students whose use of instructional materials was effective for them, have better achievement in Biology than those whose use of instructional materials is ineffective. The analysis revealed that teachers' use of instructional material enhances effective learning. The use of instructional materials in the classroom is open ended. It does not have one solution but encourages a deep learning and understanding.

This finding agreed with Duru, Uko & Utibe (2024); Asogwa (2021) that students gain experiences through practices when taught with instructional materials, that there is no better way of learning problem solving than through solving those problems themselves. Most learning occur through the sense organs, this goes to confirm the popular saying what I hear I forget but what I see I remember. Also to Olayinka (2016) is of the opinion that students who have no motivation to learn do get one thing whenever they are provide with a textbook as an instructional material in improving learning achievements.

Conclusion

The result of this study highlighted the perception of teachers' motivational variables and students' academic achievement in Biology. The findings of this study, has shown that, teachers should motivate learners through timely correction and teachers' use of instructional material to enhance the academic achievement of students studying Biology. Based on the findings of this study, it was concluded that the perception of teachers' motivational variables have resulted in significant influence in Senior Secondary One students' academic achievement in Biology in Abak Local Government Area of Akwa Ibom State, Nigeria.

Recommendations

Following the findings and subsequent conclusions of the study the following recommendations are hereby made:

1. School administrators should encourage biology teachers' and other subject teachers' should use motivational variables like timely corrections, and feedbacks, during teaching and learning processes. These help students to develop innate potentials that spur independent inquiry. They also encourage a faster and more effective assimilation of facts.

2. Policy makers and educational planners should enlighten schools through in-service training/conference and seminars on the use instructional materials in all topics in the class for easier presentation, selection of teaching strategies, methods for easy assimilation and retention by the students.

References

Akpan, I. F. (2017). Reform and quality science education in Nigeria: The needed benchmark for sustainable national development. *African Journal of Educational Assessors,* 4(1), 91-97

Asogwa,V. C., Isiwu, E. C., & Ugwuoke, C. U.(2021). Effect of teachers use of instructional materials on students' academic achievement in fishery in senior secondary schools. *Global Journal of Educational Research,* 20, 153-161

Cassell, J. (2019). Relationships between student attendance and test scores on the Virginia standards of learning tests. ED. D. dissertation.

Chappuis, J., Stiggins, R. J., Chappuis, S., & Arter, J. (2020). Classroom assessment for student learning: Doing it right, using it well. Hoboken, NJ: Pearson Education.

Dulay, S. & Karadağ, E. (2017). The effect of school climate on student achievement. The Factors Effecting Student Achievement, 10(12), 199-213.

Duru, C. M., Uko, P. J & Utibe, U. J. (2024). Application of DNA animation, improvised model and realia in teaching and students' performance based on gender in Biology in Akwa Ibom State, Nigeria. *African Journal of Educational Foundations,* 5(1), 75-92

Gershenson, S. (2016). Linking teacher quality, student attendance, and student achievement. Education Finance and Policy, 11(2), 125-149. Golob, T. & Makarovič, M. (2018). Student mobility and transnational social ties as factors of reflexivity. Social Sciences 7(3), 46–62.

Egalite, A. J., Kisida, B., and Winters, M. A. (2015). Representation in the classroom: The effect of own-race teachers on student achievement, Economics of Education Review, 45, 44-52.

Fryer, R. G. (2013). Teacher incentives and student achievement: Evidence from New York City public schools. *Journal of Labor Economics*, 31(2), 373–407. Hanushek, E. A., Piopiunik, M. and Wiederhold, S. (2018). The value of smarter teachers: International evidence on teacher cognitive skills and student performance. *Journal of Human Resources*, 54(4), 857-899.

Hanushek, E. A. & Woessmann, L. (2017). School resources and student achievement: A review of cross-country economic research. Cognitive abilities and educational outcomes, 149-171.

Newland, L. A., DeCino, D. A., Mourlam, D. J., & Strouse, G. A. (2019). School climate, emotions, and relationships: Children's experiences of well-being in the Midwestern US. *International Journal of Emotional Education*, 11(1), 67–83.

Noddings, N. (2017). When school reform goes wrong. New York: Teachers College Press.

Ntobeko, N. (2018). School resources and student achievement: A study of primary schools in Zimbabwe. Educational Research and Reviews, 13(7), 236-248.

Olayinka A. B, (2016).Effects of Instructional Materials on Secondary Schools Students' Academic Achievement in Biology in Ekiti State, Nigeria. *World Journal of Education* Vol. 6, No. 1.

Partelow, L., Spong, A., Brown, C., & Johnson, S. (2017) America needs more teachers of color and a more selective teaching profession. Washington, D.C. Center for American Progress.

Pham, L. D., Nguyen, T. D., & Springer, M. G. (2020). Teacher merit pay and student test scores: A meta-analysis. *American Educational Research Journal*, 1, 1-57.

Springer, M. G., Ballou, D., & Peng, A. X. (2014). Estimated effect of the teacher advancement program on student test score gains. Education, Finance, and Policy, 9(2), 193–230.

Tahira, K., Mumtaz, A., Abdul, H. M., Amna, S., & Memoona, K. (2017).Teachers' Perception regarding Effect of Reward System on Teachers' Performance at Elementary Level, 39(2), 107-118

Wilson, E. K. (2016). Blurred lines: Public school reforms and the privatization of public education. Washington University Journal of Law & Policy, 51(189), 190-231. Yarnell, L. M. & Bohrnstedt, G. W. (2018). Student-teacher racial match and its association with Black student achievement: An exploration using multilevel structural equation modeling. *American Educational Research Journal*, 55(2), 287–324.

Zhengdong, G., Zhujun, A. & Fulan, L. (2021).Teacher feedback practices, student feedback motivation, and feedback behavior: How Are They Associated With Learning Outcomes? Faculty of Education, University of Macau, Taipa, China, Foreign Languages College, Jiangxi Normal University, Nanchang,China original research published: 21 june 2021 doi: 10.3389/fpsyg.2021.697045