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BIOLOGY TEACHERS' SELF-MOTIVATION AS CORRELATES OF SECONDARY SCHOOL BIOLOGY STUDENTS' PERFORMANCE IN MINNA, NIGER STATE

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ABSTRACT

The study investigated the relationship between Biology teachers' Self-motivation and secondary school Biology students' performance in Minna, Niger State. The study adopted a correlational research design and was guided by one research question and one corresponding null hypothesis. A total of 105 Biology teachers and 520 Biology students formed the sample size of the study. The study focused on Self-motivation which is one of the constructs of emotional intelligence. The instrument used for data collection from the Biology teachers was the researchers' structured questionnaire titled Biology Teachers' Self-motivation Questionnaire (BIOTSEQ). The instrument was pilot-tested and data collected was analyzed using Cronbach Alpha and reliability coefficient of 0.74 was obtained. Data collected was correlated with Biology students' scores in the past centralized promotion examination of the state. Descriptive statistics, namely, mean and standard deviation with scatter plots were used to answer the research questions. Inferential statistics used was simple linear regression to test the hypothesis at a 0.05 level of significance. Results revealed that there was positive relationship between Biology teachers' Self-motivation and students' performance in .Biology. Authors recommended that Biology teachers' self-motivation should be encouraged via counselling services and seminars in secondary schools as it boost students' performance in Biology.
Key words: Biology, Emotional Intelligence, Performance, Self-Motivation

Introduction

Education is an essential tool for individual, societal and national growth and development. This necessitates the fact that quality of education to be given to citizens of the developing countries especially at the secondary school level must be such that can teach them the needed skills for individual and national development. This therefore implies that, quality education is a necessity

to build a responsible citizen who can drive the nation's economy and can also compete favourably in terms of knowledge-based globally. This requires effectiveness and high level of efficiency of the school administrators and teachers during teaching and learning (Chidobi & Eze, 2016). To achieve this quality, teachers' sound and high level of Self-motivation which is one of the major constructs of emotional intelligence is a necessity.

It is on the basis of the foregoing that the quality of education provided to students at secondary school level has become an issue of great concern to all stakeholders especially in the light of declining performance of students at Senior School Certificate Examination. The continuous decline in students' performance in science subjects especially in biology has raised issues of quality education among stakeholders in education and members of the public (James, 2018). Stakeholders and members of the public are focusing on the organization of classroom activities and management of the behavior of students which are the crucial and essential responsibilities of teachers. This is because teachers are the major implementers of the school curriculum. This implies that, as an individual or group of individuals, teachers hold a crucial position in the educational sector. Therefore, classroom teachers need specific Self-motivation skills to be able to effectively manage students' behavior, provide and sustain high standard of teaching and learning in schools. Effective and meaningful teaching and learning takes place in a classroom. A classroom is an environment where teaching and learning occurs and also where the success or failure of the teaching and learning process is measured by teachers (Obineme, 2018). This indicates that a teacher must be well skilled in terms of subject knowledge, pedagogical knowledge as well as Self-motivation to be able to achieve the educational objectives. This is one of the reasons why the current study was designed to focus on the relationship between teachers' Self-motivation and students' performance in Biology.

Self-motivation plays a vital role in every sphere of one's life as well as various phases of one's activities. Teachers' success and achievement in classroom depend on their Self-motivation to

see to the achievement of the educational goals. MacChann *et al* (2020) defines Self-motivation as the 'heart of teaching', 'the golden road to teaching' and 'a potent factor in teaching'. This definition implies that a successful teacher must posse the above three attributes. Teachers therefore need to posses high level of Self-motivation as this always results in teachers' high level of reflection, attention, interest and effort in teaching and hence fosters learning by students. Self-motivation has become a central construct in educational and psychological research and plays a significant role in several theories of human development and learning. Teachers' Self-motivation brings about inculcation and stimulation of learner's interest in the learning activities (Linsell *et al.,* 2015). Many people misconceive Self-motivation to be a personal trait which some people have and some others may not have, but in reality, Self-motivation is a force that energizes the behaviour of individuals. It is an act of stimulating interest in different activities in the students. Furthermore, it is a process by which teachers' internal energies are directed towards achieving various goals and objectives in their environment. Teachers may be highly Self-motivated to perform well in a task and utterly unmotivated in another. This means that when teachers are Self-motivated, they will work tirelessly to achieve their goals during teaching and learning processes.

High level of teachers' Self-motivation can therefore contribute positively to a teachers' teaching process. On the other hand, teachers' with low Self-motivation would find it very challenging to deal with problems responsible for students' poor performance, resulting to undermining their performance in the classroom as a teacher. For instance, Jain *et al.* (2018) believe that teachers that lack sound Self-motivation are mostly likely faced with some challenges in making some adjustments to bring about effective teaching and learning. This implies that such a teacher is most likely to fail in handling the demands of classroom as well as the demands of school extra-curriculum activities effectively. Most importantly, it may not be out of place to say that such

teachers having little or no Self-motivation are not able attain personal goals in life and not only the classroom activities.

By implication, the objectives of secondary education can generally be achieved in the classroom when teachers are highly Self-motivated. To maintain appropriate standards in secondary schools, there is a need to effectively utilize qualified, relevant, skilled and highly Self-motivated teachers. This is one of the reasons why this study was designed to have a look at the relationship between biology teachers' Self-motivation and secondary school biology students' performance in Minna, Niger State.

Statement of the Research Problem

Under normal circumstances, Biology teachers need to possess certain qualities that will enable them to deliver curriculum content effectively and assist students in developing their basic traits through the teaching and learning processes. The low or poor performance of secondary school Biology students at Senior School Certificate Examinations (SSCE) has continued to be a major concern for the government and other stakeholders in education (James, 2018). The low grades obtained by most biology students at senior school certificate examinations have jeopardized their chances of getting admission into higher institutions of learning particularly Nigerian Universities. Abidoye (2022) asserted that in an effort to reverse the ugly trend, government adopted several interventions such as seminars, conferences and workshops targeting at improving teaching and learning at secondary school level. Despite these interventions, the poor academic performances by secondary school Biology students continue to persist (WAEC (2021). Biology students mostly obtain low grades which are below the national average grades required to obtain admission to a high institution.

Researchers and public stakeholders attributed this low performance in biology to some factors which include: Students' attitude towards biology, low level of teachers' Self-motivation, poor use of instructional strategies among others (Abidoye, 2022). However, teachers' Self-

motivation is critical because it have both positive and negative effects on students. If classroom teachers positively utilizes their Self-motivation, it will result in high academic performance of the students. Conversely, if it is negatively utilized, it will lead to low academic performance (Amalu & Okon 2018). However, many Biology teachers may not be aware of how their level of Self-motivation inhibits students' participation in classroom activities and hence jeopardized their academic performances in the classroom. Based on the foregoing, this research study sought to investigate the relationship between biology teachers' Self-motivation and secondary school biology students' performance in Minna, Niger State.

Objective of the Study

This study was designed to investigate the relationship between Biology teachers' Self-motivation and secondary school Biology students' performance in Minna, Niger State. The specific objective of the study was to determine:

 1. the relationship between secondary school Biology teachers' Self-motivation and Biology students' performance.

The following corresponding research question was raised to guide the study.

   1. what is the relationship between secondary school Biology teachers' Self-motivation and Biology students' performance?

The following null hypothesis was formulated to guide the study:

HO$_1$; There is no significant relationship between Biology teachers' Self-motivation and Biology students' performance.

This study was conducted in Minna, Niger State using Biology teachers and students. Biology teachers' responses to the questionnaires and Biology students' immediate past promotion examination result (ex-post facto) were correlated during the study to establish the relationship between teachers' Self-motivation and students' performance. Findings of this study would be

significant to students, teachers, parents, school administrators, curriculum planners, researchers and ministry of education.

Empirical studies reveal that, Katanani and Sakarneh (2021) examined the influence of self-awareness, self-regulation, self-motivation, self-empathy, and self-social skills (emotional intelligence) on the academic achievement of gifted students in Saudi Arabia. One hundred fifty (male and female) students were involved in the study. Ten teachers and 30 gifted students were used for the study. Questionnaires and interview were the instruments used for data collection. Multiple regressions were used to analyze and interpret the data on the influence of emotional intelligence (self-awareness, self-regulation, motivation, empathy, and social skills) on the academic achievement of gifted students. The study further applied the effect size to determine the emotional intelligence elements that could best predict students' academic achievement. In addition, a t-test was adopted to identify the significant difference in emotional intelligence (self-awareness, self-regulation, self-motivation, self-empathy, and self-social skills) among the students based on gender. Results of the study demonstrated a significant effect of emotional intelligence on academic achievement of the students and also a difference in the emotional intelligence level between male and female students. In addition, MacChann *et al.* (2020) examined the role emotional intelligence (social-awareness, self-awareness, self-motivation and self-empathy) in the classroom instruction of high school mathematics teachers. The study was qualitative in design and was aimed at obtaining opinions and behaviours of the teachers in the school. Five mathematics teachers from five high schools in Pretoria, Gauteng were used for the study. Data was collected through semi-structured interviews. Content analysis was employed for the study. The findings revealed that (Self-motivation) emotional intelligence in the classroom plays a major role in dealing with or addressing the day-to-day challenges face by teachers during classroom instruction. The results also showed that teachers must have specific skills to cope with classroom pressure and challenges. It also revealed that, creating or

imparting values such as trust, self-respect and confidence to learners is not an easy task and that, some learners cannot cope with mathematics. The study also revealed that, giving the learners all the necessary support and instilling on discovering these kinds of values by learners play a pivotal role in facilitating effective teaching in classroom. In addition, having positive relationships between teacher and learner enhances learners' performance, thereby benefiting the learners, the school and the community in general.

On the other hand, Udo and Ukpong (2016) investigated the influence of self and social awareness on Business Education students' academic performance in Federal Universities in South-South, Nigeria. Two objectives, two research questions and two corresponding null hypotheses guided the study. The ex-post facto was used for the study. The study population consisted of all the 513 students in their second and third year of studies in the Business Education programme in the three Federal Universities in South-South, Nigeria that offer Business Education programme. A sample of 356 Business Education students from two entire years was selected for the study using a stratified sampling technique. The validated instrument (Emotional Competency Inventory) was used for data collection which was analyzed using Cronbach Alpha and reliability coefficient of 0.76 was obtained. Mean and standard deviation was used to answer the research questions while multiple regression analysis was used to test the null hypotheses at a 0.05 level of significance. The result revealed a significant influence of self-awareness and social-awareness on Business Education students' academic performance. It is recommended among others that, a balanced combination of emotional and cognitive strategies be employed in training students. This will help facilitate the identification, recognition and development of their emotional skills which will contribute to their personal, academic and career success.

Furthermore, Chukwuka and Ezeudu (2014) investigated the influence of Self-awareness, Social-awareness and Self-motivation (emotional intelligence) on students' achievement in chemical

quantitative problem solving in the Nnewi Education zone. The purpose was to determine the influence of emotional intelligence, gender and school location on students' achievement in chemical problem solving. Seven research questions and their corresponding hypotheses were formulated to guide the study. The study adopted an ex-post-facto design. The study population was 757 SS2 students from 49 government secondary schools in the Nnewi Education zone. The sample for the study was 304 SS2 chemistry students comprising 135 males and 169 females. Two-stages of sampling consisting of simple random and stratified sampling techniques were used to select the schools for the study. An Emotional Quotient Inventory (EQI) and a Chemistry Achievement Test (CAT) were used for data collection. Data were subjected to descriptive and inferential statistical analysis using means, standard deviation and Analysis of variance (ANOVA). Means and standard deviation of scores were used to answer the research questions, and the null hypotheses were tested using one-way ANOVA and two-way ANOVA. The results revealed a significant difference among the problem-solving mean achievement scores of students of high, medium and low emotional intelligence students in chemistry. Results also showed a significant difference between chemistry achievements mean scores of male and female students and a significant difference between chemistry achievements mean scores of students in rural and urban areas. It was concluded that Self-awareness, Social-awareness and Self-motivation (emotional intelligence) influences students' achievement in chemical quantitative problem solving; male students achieved relatively better than female students and students from rural schools achieved somewhat better than students from urban schools.

As a further study to the foregoing empirical studies, the current study aimed at determining the relationship between biology teachers' Self-motivation and secondary school biology students' performance in Minna, Niger State

Research Methodology

The research design employed for this study was correlational design using the descriptive survey research method. The correlational design was used because it enables researcher to determine how two or more variables are related to each other in a given group of respondents.

The population for the study comprised of all the Biology teachers and all the Biology students in Niger State public secondary schools during 2022/2023 academic session. Purposive sampling technique was used to select ten (10) coeducational secondary schools from Minna and used for the study. All the Biology teachers in all the sampled schools totaling one hundred and five (105) were used (Biology teachers' sample size) for the study. From each of the ten (10) sampled schools, only SS 2A classes were purposively sampled and used for study. All the Biology students in all the purposively sampled SS 2A classes totaling five hundred and twenty (520) students were used as the sample size of the Biology students.

Records of the existing (ex-post facto) immediate past promotion examination result of Biology students was used as. Questionnaire was used to collect biology teachers' responses. The result of 520 students was thereafter correlated with responses from 105 Biology teachers from the 10 sampled schools to determine their relationship. The predictor variable of the study is Biology teachers' Self-motivation while the criterion variable is Biology students' performance (immediate past promotion examination result).

Instrument used for data collection was the researchers' structured questionnaire titled Biology Teachers' Self-motivation Questionnaire (BIOTSEQ). The questionnaires consist of two sections A and B. Section A is concerned with the respondents' bio-data for the study while section B is made up of fifteen (15) items on Self-motivation. The items were structured based on five-point Likert scale with response mode of Strongly Agree (SA=5), Agree (A=4), Undecided (UD=3), Disagree (D=2), and Strongly Disagree (SD=1). The instruments were adapted by the researchers and validated by two experts in area of Biology education as well as in the area of test and measurement.

Reliability coefficient of the questionnaire was determined through a pilot test involving 20 Biology teachers that were not used for the study. Chronbach Alpa was used to analyze the data collected during pilot test and reliability coefficient of 0.74 was obtained. This value indicates that the instrument is consistent and reliable to be used for the study. During data collection, the researchers visited all the sampled schools, seek permission from the school administrators to carry out the research and inform the respondents of the purpose study. Vice principal academic (VP II) of each of the sampled schools were used as research assistants and were also properly briefed about the study. The instrument was administered to Biology teachers teaching in each of the sampled schools with the help of research assistants. Data collected through questionnaires was correlated with the performance scores (immediate past promotion examination results) of SS II Biology students of each of the sampled schools.

The scattered plots and standard deviation were used to answer the research question and simple linear regression was used to test the null hypothesis at 0.05 level of significance using Statistical Package for Social Science (SPSS) version 21.0

Results and Discussion

Answer to the Research

Research Question: What is the relationship between Biology teachers' Self-motivation and Biology students' performance? This research question was answered using scatter plot as shown in figure 1

Figure 1 Scatter plot relationship between Biology student's performance and Biology teachers' Self-motivation.

Figure 1 is a Scatter plot of the relationship between Biology students' performance and Biology teachers' Self-motivation. The scatter plot indicates that there was a positive relationship between the two constructs as indicated by the trend line. This finding is supported by the mean and standard deviation of the two constructs as shown in table 1

Table 1: Mean and Standard Deviation of Biology teachers' Self-motivation and Biology students' Performance

Variable	N	$\bar{x}$	SD
Performance	520	60.87	15.079
Self-Motivation	105	69.53	10.174

Table 1 shows that the mean and standard deviation of Biology students performance and Biology teachers' Self-motivation. The findings show a computed mean score of 60.87 and

standard deviation of 15.079 for students' performance and a mean score of 69.53 with a standard deviation of 10.174 for teachers' Self-motivation.

Testing of Hypothesis

HO$_1$ There is no significant relationship between Biology teachers' Self-motivation and Biology students' performance.

This formulated hypothesis was tested using linear regression, and the summary of the results is presented in Table 2a

Table 2a: **Linear Regression Model Summary on the Relationship between Biology teachers' Self-motivation and Biology students' performance**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.645[a]	.416	.412	6.762

Predictor: (Constant), Self-Motivation

Table 2a shows the regression model summary for the independent variable (Biology teachers' Self-motivation) and the dependent variable (Biology students' performance). The result shows r (1,157) =.645, r^2=. 416. The r^2 of 0.416 approximately indicated that only 42.0% of the total variation in Biology students' performance can be attributed to Biology teachers' Self-motivation. The regression coefficient is presented in Table 2b

Table 2b: Linear Regression Coefficient on the relationship between Biology teachers Self-motivation and Biology students' performance

	Unstandardized Coefficients		Standardized Coefficients		
Model	B	Std. Error	Beta	T	Sig.
1 Constant	31.966	3.715		8.604	.000
Self-Motivation	.559	.053	.645	10.564	.000

a. Dependent Variable: Classroom Management Practices

Table 2b shows the regression coefficient of Biology teachers' Self-motivation and Biology students' performance. The result shows Biology teachers' Self-motivation was a significant predictor of Biology students' performance (B = .645, t = 10.564, p (0.00) < 0.05. The finding

indicated that the standard Beta coefficient for Biology teachers' Self-motivation was positive and statistically significant. Therefore, the hypothesis was rejected. The regression coefficient indicated that for any increase in one units of Biology teachers' Self-motivation will predict an increase of 0.559 units of Biology students' performance provided all other factors are kept constant.

Findings of the Study

The data collected was analysed and it was found that:

1. There was a positive relationship between Biology teachers' Self-Motivation and Secondary School Biology students' performance.

Discussion of the finding

Finding of this study is agreement with the findings of Yahaya *et al* (2012) who examined the impact of Self-motivation (emotional intelligence) on the academic performance of secondary school students and reported that, self-awareness is a positive predictor of students' academic performance.

On the contrary, finding of this study is not in agreement with the findings of Kashani *et al* (2012) who investigated the relationship between emotional intelligence or self-awareness and academic performance of diploma and degree students and revealed that, self-awareness is not a good predictor of students' academic performance. Finding of this study is also in consonant with the finding of Udo and Ukpong (2016) who investigated the influence of self and social awareness on Business Education students' academic performance in Federal Universities in South-South, Nigeria. The result revealed a significant influence of emotional intelligence or Self-awareness and social-awareness on Business Education students' academic performance. Result of this study is also in consonant with the findings of Chukwuka and Ezeudu (2014) that investigated the influence of emotional intelligence on students' achievement in chemical

quantitative problem solving in the Nnewi Educational zone and reported a significant influence of emotional intelligence on students' achievement.

Recommendations

Based on the above finding, it is recommended that:

1. Curriculum planners should incorporate teachers' Self-motivation as a component of emotional intelligence in secondary school curriculum

1. School administrators should employ qualified Biology teachers and train them to be emotionally intelligent especially in terms of Self-motivation so as to be able improve students' performance

REFERENCES

Abidoye, F., Adebisi, A. M., Rihanat, A. A., & Aliyu, M. Z. (2022). Availability of laboratory facilities on students'performance in upper basic schools in kwara State, Nigeria. *International Journal of Educational Research Review*, *7*(4), 262-267.

Abraham, J. & Scaria, J. (2017). Emotional intelligence: The context for successful nursing leadership: a literature review. *Nurse Care Open AccesJournal*, *2*(6), 160-164.

Amalu, M. N. & Okon, A. E. (2018). Psychological Factors and Perception towards Examination Malpractice among Secondary School Students in Cross Rive State Nigeria. *Journal of Realities*, *6*(1), 22-31.

Andrei, F., Siegling, A. B., Aloe, A. M., Baldaro, B., & Petrides, K. V. (2016). The incremental validity of the Trait Emotional Intelligence Questionnaire (TEIQue): A systematic review and meta-analysis. *Journal of personality assessment*, *98*(3), 261-276.

Chidobi, R. U., & Eze Thecla, A. Y. (2016). Utilization of the Quality Assurance Handbook in Secondary School Supervision of Instruction in Enugu State, Nigeria. *World Journal of Education*, *6*(4), 30-37.

Chukwuka, C. U., No, R., & Ezeudu, D. (2014). Influence of Emotional Intelligence on Secondary School Students' Achievement in Chemical Quantitative Problem Solving.

Jain, A., Hyde, A. M., & Singhai, M. (2018). Factors affecting emotional intelligence among students. *Prestige International Journal of Management and Research*, *10*(4), 145-152.

James, O. (2018). Teachers' Professional Attitudes and Students' Academic Performance in Secondary Schools in Ilorin Metropolis of Kwara State. *eJEP: eJournal of Education Policy*.

Kashani, F. L., Azimi, A. L., & Vaziri, S. (2012). Relationship between emotional intelligence and educational achievement. *Procedia-Social and behavioral sciences*, *69*, 1270-1275.

Katanani, H. J. K., & Sakarneh, M. A. (2021). The importance of life goals and the level of their achievement among gifted adults in Jordan. *Cypriot Journal of Educational Sciences*, *16*(1), 57-72.

Linsell, L., Malouf, R., Morris, J., Kurinczuk, J. J., & Marlow, N. (2015). Prognostic factors for poor cognitive development in children born very preterm or with very low birth weight: a systematic review. *JAMA pediatrics*, *169*(12), 1162-1172.

MacCann, C., Jiang, Y., Brown, L. E., Double, K. S., Bucich, M., & Minbashian, A. (2020). Emotional intelligence predicts academic performance: A meta-analysis. *Psychological Bulletin*, *146*(2), 150.

Obineme, K. (2018). *Problems of Classroom Management and Control in Secondary Schools In Orumba North Local Government Area Of Anambra State* (doctoral dissertation, Godfrey Okoye University Ugwuomu-Nike, Enugu).

Sarrionandia, A., Ramos-Díaz, E., & Fernández-Lasarte, O. (2018). Resilience as a mediator of emotional intelligence and perceived stress: a cross-country study. *Frontiers in psychology*, *9*, 2653.

Udo, S. D., & Ukpong, O. U. (2016). Influence of self and social awareness on Business Education students' academic performance in Federal Universities in South-South, Nigeria. *International Journal of Education, Learning and Development*, *4*(6), 1-8.

Yahaya, A., Bachok, N. S. E., Yahaya, N., Boon, Y., Hashim, S., & Goh, M. L. (2012). The impact of emotional intelligence element on academic achievement. *Archives Des Sciences*, *65*(4), 2-17.

West African Examinations Council, (2021). Chief examiners' report