

Students' Self-Regulation as Correlate of Academic Achievement in Biology in Public Secondary Schools in Orlu Education Zone, Imo State, Nigeria

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Abstract

The study investigated students' self-regulation as a correlate of academic achievement in Biology in public secondary schools in Orlu Education Zone, Imo State, Nigeria. The study which adopted a correlation research design was guided by two research questions and hypotheses. The population for the study was 24,600 female students and male students. The sample size for the study was 200 female students and male students, from 5 intact classes of 40 students each, selected through a simple random sampling technique. One instrument, the "Students' Self-Regulation Questionnaire" (SSRQ) was used for data collection. The instrument was validated by three lecturers in the Department of Educational Psychology, Alvan Ikoku College of Education, Owerri. The reliability of the instrument was established using test-retest method which yielded a coefficient of 0.86. Pearson's Product Moment Correlation Coefficient (r) was used to answer the research questions and test the null hypotheses at 0.05 level of significance. Results showed a moderate extent to which acceptance of responsibility and controlling one's learning correlate with academic achievement in Biology in public secondary schools in Orlu Education Zone. In addition, there is no significant correlation between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone. It was concluded that students' self-regulation correlates with academic achievement in Biology in public secondary schools as students' acceptance of responsibility and controlling their own learning for their learning are considered important correlates.

Keywords: Students' self-regulation, Correlate of academic achievement, Public secondary schools, Orlu Education Zone

1. Introduction

Academic achievement, a very wide-ranging and broad mixture of educational outcomes is considered to be a complex construct that comprises diverse domains of learning. Stemayr, Meißner, Weidinger and Wirthwein (2014) posited that academic achievement is performance

outcomes that indicate the extent to which a learner has accomplished specific goals that were the focus of activities in instructional environments, specifically in school, college, and university. Similarly, Korb (2012) pointed out that academic achievement, in the field of education, can be conceptualised as exceptionally general (e.g., overall academic performance in school), content-specific (e.g., academic performance in a specific course such as Biology), or very specific (e.g., learning multiplication in mathematics) which should always be measured by some type of academic assessment such as an examination. However, Nnorom and Nwankwo (2020) noted a dissatisfactory level of students' academic achievement in secondary school students in Imo State, which is attributed to some families' lack modern mechanical or electronic devices, educational materials, supervision at home and some parents' unwillingness to be involved in the academic achievement of their children. Mbah, Imo, Nwokeforo and Duru (2016) revealed that academic learning of students in secondary schools is not impressively acceptable as it is being affected a number of factors such as home, school, peer and the environment. It can be therefore said that academic achievement of students is not satisfactory and urgent improvement on it is needed. Hence, students' self regulation may prove supportive in improving academic achievement.

Students' self regulation is an important factor in assessing academic achievement. Korb (2012) posited that self regulation is closely related to study skills, which entails a student's ability to accept responsibility for and controlling their own learning. Furthermore, self regulation includes setting goals for one's learning, making plans to achieve the set goals, and monitoring progress leading to the attainment of those goals.

Acceptance of responsibility is one of the aspects of self-regulation which students are expected to comply with. According to Stewart and Maisonville (2020), it is the principle of academic honesty that every student must accept responsibility by doing their own work to guarantee all students the same right to a quality education—one not unlawfully interrupted by the events of others. Becker (2011) posited that students' acceptance of responsibility for their own learning is the nucleus of self-regulated learning as learning is not something that happens to students; it is something that happens by students who see the need to update their skills, acquire new knowledge, and solve new problems throughout life. Oates (2019) posited that students' acceptance of responsibility for their learning is a way of growing independence for the learner and diminishing support from the teacher as self-regulation increases which provides perspective on the inclusion of learners' voice as a paradigm shift in teaching. Oparaji and Ugwu (2019) revealed that students' acceptance of responsibility relate positively high with academic achievement in terms of students' goal-setting strategy and planning strategy.

Controlling one's learning is strength which students' self-regulation seeks to propagate and achieve. Hence, Oates (2019) argued that when learners control their own learning, they are give opportunity to understand how they learn, their learning styles, and how they process information. This is a reflective dimension of self-regulated learning which relates to the students knowing themselves in relation to their learning and understanding the strategies that work best for them. According to Education Endowment Foundation (2018), allowing students to control their own learning encourages male students to increase their pupils' understanding of who they are, through awareness of their strengths and areas for development so as to support the learners in identifying their future learning goals. Furthermore, Benfreiff (2018) argued that students' control of their own learning makes them more persistent, receptive to instruction, willing to learn from others, honest about their performance, willing to take on challenges, willing to take risks, accurate in their estimations of their abilities, likely to view failure as

temporary, likely to take action when depressed and resilient after failure. Richmond (2014) noted that students' controlling their learning is hinged on the adoption of student-centered learning which allow students to further challenge themselves and earn at least, credit in their academic works. In a similar way, Pandolpho (2018) pointed out that it essentially encourages the designing of activities that foster learner independence to invite students to engage more thoughtfully with the content. In other words, when students are in control of their own learning, this will make students feel the influential impact of feedback, praise and criticism as they are given choices and the means to assess their progress to fosters metacognition and independence. On the part of male students, it is likely that this will make them reflect the control the students have over their learning and achievement and thus consider it a significant phase of being an outstanding teacher.

Theoretically, this study is anchored on Self-Regulated Learning Theory. Self-regulated learning was initiated by Zimmerman (1986). The theory stated that self-regulated learning is a cyclical process, wherein the student plans for a task, monitors their performance, and then reflects on the outcome. The cycle then repeats as the student uses the reflection to adjust and prepare for the next task. The process is not one-size-fits-all; it should be tailored for individual students and for specific learning tasks. This theory is deemed suitable and thus, adopted as the basis of the present study which seeks to investigate that correlation between of students' self-regulation and academic achievement. This is because the theory provides appropriate guide on how students should self-regulate their learning to achieve academically.

Statement of the Problem

Students' self-regulation is expected to lead to high academic achievement in Biology. The acceptance of responsibility and controlling one's learning are manifestations of self-regulation which are supposed to bring about their high academic achievement in Biology. However, the researcher has observed that students' self-regulation has not lead to high academic achievement. More specifically, the researcher suspects that students' inability to accept responsibility and control their own learning translates to low academic achievement. At the moment, many students fail to accept responsibility and also control their own learning. Still, there are limited literature on the correlation between students' self-regulation and academic achievement in Biology. This constitutes that gap which the present study seeks to fill, hence, the need for the study. Therefore, the problem of this study put in question form is: "What is the correlation between students' self-regulation and academic achievement in public secondary schools in Orlu Education Zone, Imo State, Nigeria?"

Purpose of the Study

The purpose of this study was to investigate students' self-regulation as correlate of academic achievement in public secondary schools in Orlu Education Zone, Imo State, Nigeria. The specific objectives were to find out:

the correlation between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone.

the correlation between controlling one's learning and academic achievement in Biology in public secondary schools in Orlu Education Zone.

Research Questions: The following research questions were answered in this study:

What is the correlation between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone?

What is the correlation between controlling one's learning and academic achievement in Biology in public secondary schools in Orlu Education Zone?

Hypotheses: The following null hypotheses were tested in this study at 0.5 level of significance:

There is no significant correlation between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone.

There is no significant correlation between controlling one's learning and academic achievement in Biology in public secondary schools in Orlu Education Zone.

2. Methods

The study adopted a correlational research design. According to Nworgu (2015), a correlation research design is the research design that measures the relationship between two or more factors to determine or estimate the extent to which the values for the factors are related. Therefore, the researcher adopted correlational research design to determine the correlation between students' self regulation and academic achievement in public secondary schools. The population for the study was 24,600 students in public secondary schools in Orlu Education Zone, Imo State. This population was made up of 12,826 female students and 11,774 male students. The sample size for the study was 200 students in public secondary schools in Orlu Education Zone, Imo State. The sample was made of 5 intact classes where each intact class had 40 students. The researcher used simple random sampling technique to select the 5 intact classes in secondary schools in the zone. In order to carry out the above procedures successfully, the researcher constructed ballot papers for balloting. The balloting was done with replacement (balloting with replacement) in order to ensure that each member of the population will have a chance of being sampled. Any member that was sampled twice was not included. The researcher developed one instrument that were used for data collection in this study. The instrument was "Students' Self Regulation Questionnaire" (SSRQ). Students' Self Regulation Questionnaire consisted of two sections; sections A and B. Section A comprised of demographic information of the respondents, such as gender and location. The Section B which contained 20 items focused on students' self regulation with acceptance of responsibility and controlling one's learning as sub-variables. Each sub-section contained ten (10) items. In addition, Proforma was used to gather students' academic achievement in Biology in order to measure students' Biology academic achievement. The instrument, SSRQ was rated on Likert's modified four-point scale of: Strongly Agree (SA) – 4, Agree (A) – 3, Disagree (D) – 2 and Strongly Disagree (SD) – 1. The instrument, "Students' Self Regulation Questionnaire" was validated by three lecturers in the Department of Educational Psychology, Alvan Ikoku College of Education, Owerri in Imo State. Copies of SSRQ were given to these three lecturers to read through the instrument to evaluate whether the questions effectively capture the topic under investigation; check the instrument for common errors like double-barreled, confusing, and leading questions. After thorough examination and proof-reading, the lecturers made comments, observations and corrections. Finally, all their comments, observations and corrections were included to improve on the quality of the instrument. This ensured that the instruments met both face and content validities. The reliability of "Students' Self Regulation Questionnaire" was established using test-retest method and the two administrations correlated using Pearson Product Moment Correlation. For the test re-test reliability, a sample of 20 students in Secondary Schools in Okigwe Education Zone, Imo State was used in the pilot study after being selected using simple random sampling. Twenty (20) copies of SSRQ were administered to the respondents and after two weeks, the instrument was re-administered to the

same respondents. The first and second administrations were correlated using Pearson Product Moment Correlation. The correlation index obtained for SSRQ was 0.86. Indeed, this value indicated that the instrument was reliable for the study. Two hundred (200) copies of the instrument were administered directly to the respondents, by the researcher with the help of two (2) research assistants. This ensured that the researcher covered all the selected schools for the study, within reasonable time. Instructions guiding the filling of the instrument were explained to the respondents. The researcher and assistants supervised the filling, after that, the 200 copies of the instruments administered were collected from the respondents on the spot. The completed instruments gathered were sorted, arranged, organised, and used for data analysis. In analysing the data arising from this study, Pearson's Product Moment Correlation Coefficient (r) (PPMCC) was used to correlate the scores of the instrument with students' achievement scores in Biology in order to answer the research questions. In addition, the same statistic was used to test the significant correlation of the hypotheses at 0.05 level of significance. The acceptance or rejection of any of the null hypotheses was based on the critical value of (0.5) and the calculated value at alpha significant levels. Hence, if the calculated value were greater than the table value, the null hypotheses was rejected but if the calculated value were less than the table value, the null hypotheses were accepted.

3. Results and Discussion

Research Question 1:

What is the correlational coefficient of the association between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone?

Table 1: Pearson Product Moment Coefficient index in the association between acceptance of responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone

		PLE	Academic Achievement
Acceptance of Responsibility	Pearson correlation	1	.530
	Sig (2-tailed)	200	.000
	N		200
Academic Achievement	Pearson correlation	.53	1
	Sig (2-tailed)	.000	
	N	200	200

Correlation is significant at 0.05 level (2-tailed)

Table 1 revealed a coefficient index of 0.53 in the relationship between acceptance responsibility and academic achievement in Biology in public secondary schools in Orlu Education Zone. The coefficient index signified a moderate association between the two variables under consideration.

Research Question 2:

What is the correlational coefficient of the association between self-regulation and academic achievement on Biology in public secondary schools in Orlu Education Zone?

Table 2: Pearson Product Moment Coefficient index in the association between self-regulation and academic achievement in Biology on public secondary schools in Orlu Education Zone

		PLE	Academic Achievement
Self-regulation	Pearson correlation	1	.580
	Sig (2-tailed)	200	.000
	N	200	200
Academic Achievement	Pearson correlation	.580	1
	Sig (2-tailed)	.000	
	N	200	200

Correlation is significant at 0.05 level (2-tailed)

Table 2 shows a correlation coefficient index of .580 between self regulation and academic achievement of public secondary school students on Biology in Orlu Education Zone. The coefficient index signifies a moderate relationship between the two variables of interest (self-regulation and academic achievement). Further explained, the control secondary school students have on then achievement in Biology is moderate (.580).

Discussion

The study found that there is a moderate extent to which acceptance of responsibility correlates with academic achievement in Biology in public secondary schools in Orlu Education Zone. The study revealed that there is a moderate extent to which acceptance of responsibility correlates with academic achievement in Biology in public secondary schools in Orlu Education Zone. This finding is in agreement with that of Okparaji and Igbokwe (2020) who found that students' acceptance of responsibility with respect to self-instructional strategy relates with the planning and organisation of their learning process, time management and with their memorisation of concepts taught. Alotabi, Tohmaz and Jabak (2017) found that students assume varying degrees of accountabilities for their learning by making decisions on all aspects of the learning process determining the objective, defining learning progressions, selecting usable methods and evaluating what has been learnt. The implication of this finding is that when students accept responsibility of their learning, they will achieve more academically as against in situations when they are not responsible for their own learning. Furthermore, male students will therefore become more concerned on how best to channel their efforts, experiences, skills and competences to reposition their students to be able to accept and assume full responsibility of their learning tasks to enhance their academic achievement.

Furthermore, the study found that there is no significant correlation between controlling one's learning and academic achievement in Biology in public secondary schools in Orlu Education Zone. In addition, the study revealed that there is no significant correlation between controlling one's learning and academic achievement in Biology in public secondary schools in Orlu Education Zone. This finding is similar to that of Abbey and Okorogba (2017) who found that one major element of students' self regulation is that the students control or take care of their learning process to enhance or improve students' learning interest and increases the cognitivism of a students. Similarly, Ekechukwu and Amaeze (2017) found that students control their learning through motivation, self-concept, interest, attitude, self efficacy and readiness all of which relate to their academic achievement. The above finding of this study is in contrast with

that of Nagaraju in Siahi and Maiyo (2015) that students hardly devote sufficient time to the studies and seldom has proper study habit. This is because the present study has indicated that the students who control their learning by possessing study habit are known for high academic achievement. The implication of this finding is that when students are made to be in full control of their learning, they will achieve more academically unlike when they are not in full control of their own learning. Again, male students will then be confronted with the question of improving on themselves so that they will be able to influence their student to take full control of their own learning endeavours so that there will be improvement in their academic achievement.

4. Conclusion

Considering the findings of this study, it is concluded students' self regulation correlates with academic achievement in Biology in public secondary schools. Students' acceptance of responsibility for their learning is related to academic achievement. Moreover, Students' controlling their own learning is related to academic achievement in Biology. Hence, students' acceptance of responsibility and controlling their own learning are related to academic achievement. It is when students are positioned to be fully responsible for their learning and be in full control of same that they will be encouraged to achieve more in their academics.

Recommendations

Secondary school Students should strategise to ensure that they equip their students to accept responsibility of their learning. This will enhance the students' academic achievement.

Secondary school Students as implementers of teaching should partners with curriculum developers to ensure that more avenues are created to enable students take control of their own learning. This will help the students record more progress in their academic pursuits and become fulfilled individuals.

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Appendix: Instrument for Data Collection

Section A: Demographic Information

Instruction: Please, choose and mark the appropriate information below.

Gender: Male () Female ()

Location: Rural () Urban ()

Section B: Students' Self Regulation Questionnaire (SSRQ)

Instruction: Use Strongly Agree (SA), Agree (A), Disagree (D) or Strongly Disagree (SD) to complete the instrument below.

A	Acceptance of responsibility entails the following:	Response Format
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		SA	A	D	SD
1	Acceptance of responsibility entails a self-directive process				
2	It enables students to transform mental abilities into academic skills				
3	It is a regular mental knowledge process				
4	Learners are active in learning to construct meanings internally				
5	Learners are not passive receivers of external knowledge				
6	Acceptance of responsibility is the nucleus of self improvement				
7	Learning happens by students				
8	It entails updating life skills				
9	There is focus on acquiring new knowledge throughout life				
10	It emphasises solving life's new problems				
B	Controlling one's learning entails the following:				
11	Learners decides what happens in their learning				
12	Learner do not passively receive knowledge from external sources				
13	It makes students focus on the "how-to-learn" skills				
14	It provides potentials for increased academic performance				
15	It involves goal setting by students				
16	Students plan their own learning activities				
17	Students get involved in self-monitoring				
18	There is student's self-evaluation				
19	It regulates individual student's actions				
20	Student establish strategies for achieving their aim in learning				

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