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GOAL SETTING SELF-REGULATED LEARNING AS CORRELATE OF SENIOR SECONDARY SCHOOL TWO (SS 2) STUDENTS' INTEREST IN BIOLOGY

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ABSTRACT

This study examined goal setting self-regulated learning as correlate of senior secondary school two SS 2 students' interest in Biology in Awka metropolis. The design was correlational research type. The target populations for the study were Biology students of senior secondary II (SS II) classes in Onitsha education zone in Anambra state, Nigeria. The sample for the study was three hundred and thirty two (332) Biology students (male: 156 and female: 176) drawn through stratified and simple random sampling techniques. Two research questions and one hypothesis is raised to guide the study. The instruments used to elicit the relevant data were: A twenty item instrument questionnaire called Goal Setting Self- Regulated Learning Scale (GSSRLS) and Biology Self-Regulated Interest Scale (BSRIS) which were adapted by the researchers. The reliability coefficient of .845 for GSSRLS and .88 for BSRIS were obtained using Cronbach's Alpha. The data collected were analysed using Pearson's Product Moment Correlation for research questions and the sole hypothesis was tested at 0.05 level of significance using regression ANOVA. The results revealed that: there is a significant relationship between students' goal setting self- regulated learning and S S 2 interest in Biology. A significant difference between male and female students' goal setting self- regulated learning and their interest in Biology in S S 2 in favour of female students. Based on the findings of the study, conclusions and recommendations were made.

Keywords: Biology, Goal Setting Self-Regulated Learning and Interest

Introduction

Nigerian as a nation is in dire need of scientific and technological growth so as to minimize total dependence on foreign nations for expertise in the fields of Science and Technology. This will enable the nation to effectively harness her potential to improve the standard of living of her citizens. In order to meet these needs, the Nigerian government through the Federal Ministry of Education incorporated science subjects into senior secondary school curriculum to encourage students take up this task in sciences (Ihekwoaba et. al., 2020). Kingdom-Aaron et al. (2019) opined that science is the study of nature. Khalifa (2016) reported that science is a step by step process by which individuals search for knowledge, investigate and verify natural phenomena which makes the subjects relevant to humanity. Ihekwoaba et al. (2020) asserted that science subjects in senior

secondary school in Nigeria are Chemistry, Physics and Biology.

Biology is a branch of natural science that deals with the study of living organisms, structures, functions, evolutions, distribution and interrelationships. Arsal (2019) viewed Biology as the science of life or the study of living things. Obikezie et.al. (2022) averred that Biology covers all the life processes such as movement, respiration, nutrition, irritability, growth, excretion, ecological system and reproduction which make it more important and useful to man. Opara (2019) opined that importance of Biology includes helping man in scientific research, development of new tools, exploring of new environment and environmental identification such as ecology and techniques needed to improve the quality of lives. However, in spite of all these importance of Biology to man, many secondary school Biology students still experience weaknesses in Senior School Certificate Examination (SSCE).

West African Examination Council (WAEC) Chief Examiners' reports 2019, 2020 and 2021 outlined a number of reasons for the weaknesses of students which tantamount to level of achievement in Biology. Among the reasons given were: (i) inability to explain why a Rhesus negative man should not marry a Rhesus positive to avoid losing her second pregnancy (ii) poor grasp of genetics (iii) not given title to diagrams (iii) poor diagrams (iv) inability to cross breeding in the genetics properly (v) poor performance in questions that require application knowledge (vi) inability to identify parts of skeleton. All these have given many educators/stakeholders some concern and research has attempted to delve into causal factors.

Atmotoya (2014) averred there are factors suspected to be responsible for low level and weaknesses among secondary school students' academic achievement in Biology. Some of these factors include lack of teaching material, interest, motivational orientation, attitude, self-esteem/self-efficacy, emotional problems, study habits, teacher consultation and poor interpersonal relationships among students' teachers' poor pedagogical and content knowledge of the subject matter, parental background, extrinsic motivation, anxiety, poor interest, attitude, low self-concept and inability to regulate self-learning.

Self-regulated learning places more responsibility on the learner to participate actively in classroom environment where student-student and student-teacher interact. There are four basic self-regulation strategies that all students need to be able to use: goal-setting, self-monitoring, effective use of self-instructions or self-talk, and self-reinforcement (Bandura, 2010).

The most effective one among the four is goal setting self-regulated learning (GSSRL) because it helps students achieve excellence through practice (Bandura, 2010). Similarly, it takes planning, effort, and persistence over time. Goal setting self-regulated learning allows students to become autonomous learners who can pursue their own interests. Alben (2016) submitted that in GSSRL students are prepared each day to discuss and write down their thoughts on subjects outside their class and actively participating in

learning among themselves. Active learning unlike passive learning is dynamic and has won unanimous support for its use in teaching learning of science subjects especially in Biology (Chorng et. al., 2019). Alben (2016) observed that there is a relationship between goal setting self-regulated learning (GSSRL) and students' interest in science subjects. Alben maintained that active learning is an important aspect of GSSRL. Opara (2018) opined that there is a positive relationship between goal setting self-regulated learning and students interest in Chemistry in Owerri municipal city Nigeria, which leads to students understanding of the subject in taking control of learning process.

Banu (2013) asserted that is a moderate correlation between goal setting self-regulated learning (GSSRL) and high school students in Biology interest in Turkish EFL. Long (2013) observed a moderate correlate between goal self-regulated learning and students' academic interest in Mathematics in Australian program in Malaysia. Ogbenevwede (2019) averred that there is a moderate correlate between goal setting self-regulated learning and students' academic interest in Biology in Delta Central Senatorial District. Ogbenevwede (2019) further averred that is a significant difference between male and female student in the relationship of goal setting self-regulated learning and academic interest of secondary school students' biological concept of unit of life in Delta Central Senatorial District in favour of female students.

Nanda et. al. (2020) observed that there is a positive correlate between goal setting self-regulated learning and learning motivation with metacognitive interest in Biology subject in Thialand. The authors further observed that is a significant difference in male and female high school students' goal setting self-regulated learning and learning motivation with metacognitive skill in Biology subject in Thialand in favour of female high school students. Meanwhile, Nwafor et. al. (2015) did not find a significant relationship between junior secondary school students' goal setting self-regulated learning and students' interest in Basic science. Furthermore, in a study designed to uncover psychological differences between academically weak and gifted students using the Tennessee self-concept scale (TSCS) and Tennessee cognitive development scale (TCDS), Garrido Vergas (2012) did not find the two 33-member groups to differ in mean goal setting self-regulated learning and mean interest.

A large body of literature has also reported a relationship between gender, goal setting self-regulated learning and students' interest reported that boys seem to have a more positive relationship in goal setting self-regulated learning and interest in a number of dimensions such as Biology than girls (Kadivar et. al., 2012; Matura, 2009; Nasir & Akhtar, 2013)

From the foregoing, it appears the question of whether relationship exists or does not exist between goal setting self-regulated learning and interest of secondary school students in Biology has not been concisely answered because both the theoretical and empirical studies reviewed in

this study have produced diverse and contradictory results. Similarly, the issue of gender difference in goal setting self-regulatory learning (GSSRL) and interest in Biology especially in Onitsha metropolis of Anambra state has not been resolved and therefore subject to further investigation. Thus this study focused on goal setting self-regulated learning as correlate of senior secondary school SS 2 students' interest in Biology in Ontisha metropolis of Anambra state, Nigeria.

Purpose of the Study

This study investigated on goal setting self-regulated learning as correlate of SS 2 students' interest in Biology.

1. The relationship between goal setting self-regulated learning (GSSRL) and SS 2 students' interest in Biology.
2. The relationship between students' GSSRL and SS 2 students' interest in Biology based on gender.

Research Questions

The following three research questions guided this study:

1. What is the relationship between goal setting self-regulated learning (GSSRL) and SS 2 students' interest in Biology?
2. What is the relationship between students' goal setting- regulated learning GSSRL and SS 2 students' interest in Biology based on gender?

Hypothesis

The sole null hypothesis was tested in this study at 0.05 alpha level of significance.

There is no significant relationship between goal setting self-regulated learning and SS 2 students' interest in Biology.

Research Method

The study employed a correlation research design. This design according to Nworgu (2015) seeks to establish the relationship that exists between two or more variables. The area of the study was Onitsha education zone. The population of the study comprised of all the 4000 Senior Secondary two (SSII) Biology students in the 28 State owned co-educational secondary schools in the zone (2640 females and 1360 males). Simple random sampling was used to draw 4000 students (2640 female and 1360 male) from the total population. Each stratum comprised Ogbaru (408 males and 822 females) Onitsha North (1640 males and 1018 females) Onitsha South (800 females and 312 male). Using standard table of Yamame, sample size of 0.5% of population of 4000 is 333. One questionnaire was discarded for improper completion. Thus, sample size for which investigation was complete was 332 (156 males and 176 females).

Instrument

Two instruments were used for the study; Goal Setting Self- Regulated Learning (GSSRL) and Biology self-regulated interest scale (BSRIS). Goal Setting Self-Regulated Learning Scale (GSRL) was adapted from "Development and validation of an academic self- regulation of an academic scale for university students' by Nasir (2013) and their colleague researchers from school of education, university of Michigan and the

National Center for research to improve post-secondary teaching and learning (NCRIPTAL) named academic self – regulated scale. The instrument is designed with 10 items regarding students' use of different cognitive and metacogniive strategies and 10 items concerning student management of different resource. Scale questions, where the scores range from 1 ("strongly disagree") to 4 ("strongly agree") was used. The researcher came up with twenty items (20) from Nasir's instrument named GSRL. GSRL is a 4-point scale of strongly agreed, agreed, disagreed, and strongly disagreed. To ensure the reliability of 20 items GSRL, the instrument was pilot tested using 25 students in Awka education zone which is outside the area of study, a coefficient of .85 was obtained using cronbach alpha indicating that the instrument is reliable.

The second instrument named Biology self-regulated interest scale (BSRIS) is also a 4-point scale of strongly agreed, agreed, disagreed, and strongly disagreed adapted from goal setting motivation, self – directedness interest 1990. The 20-item questions adapted in line with the experts' advice. To ensure the reliability of 20 items BSRIS, the instrument was pilot tested using 25 students in Awka metropolis which is outside the area of study, a coefficient of .80 was obtained using cronbach alpha indicating that the instrument is reliable. Both GSRL and BSRIS where validated by three expects, two from Department of Science Education Biology option Nnamdi Azikiwe University Awka and from Department of Education Foundations Nnamdi Azikiwe University Awka. Pearson product moment correlation was used to answer research questions while Regression ANOVA analysis was used to test the significant relationship at .05.

Ranges of scores	**Decision**
±0.80 – ± 1.00	High positive or negative relationships
±0.31 – ± 0.79	Moderate positive or negative relationship
±0.00 – ± 0.30	Low positive or negative relationship.

Presentation of Results

The result of this study was presented in line with the research questions and the hypotheses as follows.

Research Question 1: What is the relationship between goal setting self-regulated learning (GSSRL) and SS 2 students' interest in Biology?

Table 1: Pearson's Product Moment Correlation Analysis of the relationship between Students' goal setting self-regulated learning strategy GSSRL and their interest in Biology.

Variable		SD	N	r	R^2
GSSRLS	54.08	3.39	332	0.39	0.15
Academic interest	47.72	4.61			

R^2 = coefficient of determination

To answer research question 1, responses students' goal setting self-regulated learning strategy GSSRL and their interest in Biology scores were correlated and the correlation coefficient obtained was 0.39 as shown on Table 1. This means that, there exists a direct positive relationship between students' goal setting self-regulated learning strategy GSSRL and their interest in Biology but the relationship was moderate. The coefficient of determination associated with the correlation coefficient of 0.39 was 0.15. This coefficient of determination indicates that, 15% of students' GSSRL accounted for the variation in their interest in Biology. This implies that 85% of variation in their interest is attributed to other factors.

Research Question 2: What is the relationship between students' goal setting-regulated learning GSSRL and SS 2 students' interest in Biology based on gender?

Table 4: Pearson's Product Moment Correlation Analysis of the relationship students' GSSRL and interest in Biology base on gender

Variable	SD	N	r	R^2
Male Students' interest 53.16	3.23	156	0.09	0.01
Female Students' interest 55.00	3.30	176	0.80	0.63
Difference in r			0.71	

R^2 = coefficient of determination

In order to provide answer to research question 2, male students' responses on students' interest in Biology scores were correlated and the correlation coefficient obtained was 0.09 as shown on Table 2. This means that, there exist a weak positive relationship between male students' and interest in Biology. The coefficient of determination associated with the correlation coefficient of 0.09 was 0.01. This coefficient of determination indicates that, 1% of male students accounted for the variation in their interest in Biology. This implies that 99% of variation in their interest in Biology is attributed to other factors other than male students. Table 2 also shows that, female students' responses and their interest scores were correlated and the correlation coefficient obtained was 0.80 as shown on Table 2. This means that, there exist a direct positive relationship between female students and their interest in Biology. The coefficient of determination associated with the correlation coefficient of 0.80 was 0.63. This coefficient of determination indicates that, 63% of female students accounted for the variation in their academic interest in Biology. This implies that 37% of variation in their academic interest is attributed to other factors other than the female students. The difference in the relationship between students and their academic interest was 0.71in favour of female students.

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Hypothesis: There is no significant relationship between goal setting self-regulated learning and SS 2 students' interest in Biology.

Table 3: **Regression Analysis of the relationship between goal setting self- regulated learning GSSRL and interest in Biology.**

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	572.645	1	572.645	58.430	.000
Residual	3234.159	330	9.800		
Total	3806.804	331			

$\alpha = 0.05$

In order to test hypothesis 1 (H_{O1}), regression analysis was used. The result in Table 3 shows thatan F-ratio of 58.43 with associated exact probability value of .00 was obtained. This exact probability value of .00 was less than .05 level of significance set as bench mark and it was found to be significant. The null hypothesis which stated that there is no significant relationship between students' GSSRL and their interest in Biology is therefore rejected and inference drawn was that, there is a significant relationship between students' GSSRL and their interest in Biology.

Discussion of Findings

Result in Table 1 is correlation coefficients of the relationship between students' goal setting self-regulated learning strategy GSSRL and SS 2 students' in Biology. Results showed that the correlation between students' goal setting self- regulated learning strategy GSSRLS and SS 2 students' in Biology is .40. This means there was a moderate positive relationship between students' goal setting self- regulated strategy learning and SS 2 students' interest in Biology. This finding portrays that self-regulated learning does plays an important role in either to predict or to affect SS 2 Biology students' interest as 16% of students' Self-regulated learning accounted for the variation in interest in Biology. The finding of this study supported that of other previous researcher such as Banu (2013) who asserted that is a moderate correlation between goal setting self-regulated learning (GSSRL) and high school students' interest in Biology in Turkish EFL. Also the finding is in line with Long (2013) who observed a slight positive correlate between goal self-regulated learning and students' interest in Mathematics in Australian program in Malaysia and Ogbenevwede (2019) who averred that there is a moderate correlate between goal setting self-regulated learning and students' interest in Biology in Delta Central Senatorial District. The study is also in consonance with Garrido Vergas (2012) who did not find the two 33-member groups to differ in mean goal setting self-regulated learning and mean interest in a study designed to uncover psychological differences between academically weak and

gifted students using the Tennessee self-concept scale (TSCS) and Tennessee cognitive development scale (TCDS). By virtue of this finding, this research has joined the school of thought that relates students' goal setting self-regulated learning significantly to students' interest secondary school Biology concept.

In order to provide answer to research question 2, male students' scores on interest in Biology were correlated with those female students' scores on interest in Biology and the correlation coefficient obtained were .34 and .44 as shown on Table 2. This means that, there exist a weak positive relationship between male students' scores and female students' scores in Biology interest in favour of female students. The inference drawn was that, there was a significant relationship in the difference between male Biology students' interest and that of their female counterpart in favour of female students. Hence female students have high interest than the male students in Biology. This result is not in line with researchers' like Kadivar et. al. (2012), Matura (2009), Nasir and Akhtar (2013) who observed that that boys seem to have a more positive relationship in goal setting self-regulated learning and interest in a number of dimensions such as Biology than girls but the finding is in line with Nanda et. al. (2020) and Ogbenwede (2019) who claimed that the female students had a better interest in Biology than the male students. There is a statistically significant difference between male and female students in their interest in Biology but the finding of the study is not in line with the findings of Nwafor et. al. (2015) who observed no significant relationship between junior secondary school students' goal setting self-regulated learning and students' interest in Basic science. By virtue of this finding, this research has joined the school of thought that relates male and female students' goal setting self-regulated learning significantly to male and female SS 2 students' interest in Biology in favour female students.

Conclusion

Based on the investigation into goal setting self-regulated learning strategy as correlate of SS 2 students' interest in Biology in Awka metropolis of Anambra State, it can be concluded among others that female students responded better in goal setting self- regulated learning strategy GSSRLS and interest in SS 2 Biology better as compared to the male students in Biology and there is a significant difference between students' GSSRLS and their interest in Biology.

Recommendations

1. Curriculum developers should design programmes and courses that will motivate students to think critically and to enhance their interest towards Biology.
2. Self- regulated learning strategy training workshops and seminars should be organized for Biology teachers by government to properly inculcate into them the right interest to be exhibited in Biology lessons, this will enable to increase students in the subject.

3. Parents should develop high self-regulated learning strategy in their children at the early stages of their lives. This could be best done at home which is the most important social force in shaping and maintaining the child's self-learning. The home environment is the strongest agent in shaping the child's self-learning, so the earlier he is exposed to positive self-regulated learning formation the better. Positive attitudes of the parents towards their children will boost their ego, strengthen their feeling for self- regulated learning and act as another form of motivation to work harder. Empathy should be applied in this kind of relationship and no sign of conflict of interest should be experienced in their child's choice of subjects and career especially in Biology related once.

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