



## Self-Efficacy, Study Habit and Attribution Style as Predictors of Senior Secondary School Students' Achievement in Biology in Ogidi Education Zone

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### Abstract

This study investigated self-efficacy, study habit and attribution style as predictors of secondary school students' achievement in Biology in Ogidi Education Zone, Anambra state. Four research questions and four null hypotheses guided the study. Correlational research design was adopted in the study. The population of the students was 2875 Biology students in Ogidi Education Zone out of which 800 students were sampled for the study. Students Self-Efficacy Scale (SSES), Study Habit Inventory (SHI) and Attribution Style for Students (ASS) validated by three experts were used as instruments for data collection. The reliability coefficient of SSES, SHI and ASS were established using Cronbach's Alpha and the reliability indices obtained were 0.889, 0.748, 0.719 and 0.966 respectively. Data from the study was analyzed using simple and multiple linear regressions. Findings from the study revealed significant relationship between students' self-efficacy, study habits and students' achievement. There was no significant relationship between attribution style and achievement. It was recommended that the Federal, State and Local government should organize workshop, seminars and conferences for teachers and other school administrators to sensitize students on the importance of self-efficacy and study habit and their roles in achievement in Biology.

**Keywords:** Self-Efficacy, Study-Habit, Attribution Style, Achievement, Biology

### Introduction

Science and technology have become integral parts of the culture of the world today. In the same vein, science education is a very important tool for sustainable development. This is why the federal republic of Nigeria (FRN, 2013) in the National Policy on Education (NPE) emphasized the need to popularize the study of science to inspire and support national development. Secondary education is the education children receive after primary education and before the tertiary education. In Nigeria, the goal of secondary education is to raise generation of people who can think for themselves, respect the views and fillings of others, respect dignity of labor, appreciate those values specified under the broad national goals and live as a good citizen (Federal Republic of Nigeria FRN, 2013).

Biology is a branch of science that boosts the development of scientific and technological attitudes in students. It studies living and non-living things (Ramalingam, 2011), such as plants and animals. The study of Biology as a subject at the secondary school level helps students in developing basic science skills, knowledge and attitude-based competencies required for problem solving in their environment. Considering the importance of Biology to humanity, it is suitable to give standard foundation in Biology while at secondary school to avoid jeopardizing their future

achievement in the subject. It is also expected to manifest high level of achievement in this subject both at internal and external examination. There are major variables which measure learner's success or failure in Biology. One of those variables is achievement.

Academic achievement is basically cognitive and is usually measured using continuous assessments and examinations done at the beginning and end of any term and session. Academic achievement is the amount of knowledge derived from learning (Archana, Chamundeswari & Tammilnadu, 2013). When students perform very well in Biology, they will have the feeling of pride that they made success through their own effort and skills, such little success can even give them sense of achievement and accomplishment (Obialor, 2016). However, students' performance in Biology at external examination has remained persistently poor (Obialor, 2018). For example, in report of WAEC 2012-2017, Biology has the highest failure.

This poor academic achievement of Biology in schools is faced with many factors. Various reasons have been attached to these factors by scholars. Poor teaching method adopted by most Biology teachers has been a specific factor to this (Nwagbo & Obiekwe, 2009; Okoye, 2014). Archana, Chamundeswari and Tammilnadu (2013) also added that factors such as children's attitude, interest, personality characteristics and social class in addition to learning affect students' academic

achievement. Dinah (2013) concluded that, availability of text books, laboratory apparatus, and other learning resources contribute significantly to the achievement of students in Biology. He added that, students with positive attitude towards the subject register better performance than those with negative attitude. Those with positive attitude are motivated to work hard and that is reflected in the good marks scored in the examination. The factors that negatively affect Biology achievement include: student's self-efficacy, lack of interest and their background. In Nigeria, efforts are being made by researchers, government and non-governmental organizations to improve cognitive outcomes among Biology students. Year to year there are conferences, seminars and workshops organized for both students and teachers as a motivational approach to learning, equipping the libraries and the laboratories with modern and current textbooks and equipment but even at that, achievement in Biology at the secondary school level remains low and unimpressive.

Suman (2011) in his research identified the influence of parents' education and parental occupation on academic achievement of students and concluded that education and occupation of parents influence the academic achievement of students. Akinsanya et al., (2014) maintained that parents' education has the highest significant influence on the academic achievement of students. This is because the child from educated family has lots of opportunity to study hard due to his/her access to newspaper, television and internet. They can also be taught extra lesson at home. Children raised from an illiterate family have limited access to newspaper, television and internet. Osuafor and Okonkwo (2013) in their research on influence of family background on academic achievement of secondary school Biology students revealed that family structure, parent's occupation and educational level of parents did not have significant influence on student's achievement in Biology. The factors that contribute to the academic achievement of Biology have been observed by many researchers and viewed in different angles due to its diversity. However, among the factors affecting student's achievement in general, less attention has been paid to self-efficacy, study habit and attribution style.

Self- efficacy is concerned about the perception of being able to accomplish a specific goal. Self is the identity of a person while efficacy is defined as either external forces, such as fate or the power to produce an effect. Self-efficacy is the

belief in one's own capacity to organize and execute the courses of action required to manage prospective situation (Stajkovic and Luthans, 2018). It is true that when an individual gains or maintains self-efficacy through the experience of success, however small, they generally get a boost in achievement to continue learning and making progress (Meyer, 2010). Studies show that one's own belief of efficacy is an important determinant of motivation that affects thought and action (Lumenburg, 2011).

Study habit refers to the student skills in learning the subjects. Obe, Kassim, Adewale and Abayomi (2016) referred to study habit as those behaviors that one manifest when studying such as listening to music, chewing kolanuts, smoking coffee, taking memory pills and ant sleeping drugs, lying down while studying and so on. He said further that not all behaviors manifest during study are positive rather those that are positive are called study habits. He concluded that study habit is the ability to acquire information, do mental processing of information for logical organization and understanding, rereading and memorizing for a long-time meaningful retention and recalling of information on important occasions such as during tests or examination situations. Ball in Ajayi *et al*, (2016) the following study habits usually contribute to unsatisfactory grade of students in tests or examinations: procrastination and overloading, lack of study time plan, memorization, and ignorance. He concluded that many committed students experience frustration and despair in schools not because they lack the potential, but because they do not have the appropriate study habits to learn. This assertion was supported by Rana and Kausar (2011) who said that many students fail not because they lack ability but because they do not have study habits.

Attribution style also plays an important role in student achievements (Moskowitz, 2015). Wade and Tavris (2010) maintained that attribution is a process by which people are motivated to explain their own or others behavior by pointing at causes of those behaviors to a situation. Attributions are perceptions about the causes of success and failure. A student can construct various explanations for getting a low mark on a test. Students' success or failure in school can be attributed to factors such as environmental factors, student self- efforts, student luck (Kelly, 2012). Some fundamental attributions have been found to have significant and widespread effects on behavior and decision making (Brown, Gray and Ferrara, 2015). Therefore, in this context,

attribution styles are cognitive variables that reflect how individuals explain bad events that befall them as measured by attribution scale.

The purpose of the study was to determine self-efficacy, study habits, attribution style as predictors of secondary school students' achievement in Biology. Specifically, the sought to determine whether:

1. Self-efficacy predicts students' achievement in Biology.
2. Study habit can predict students' achievement in Biology.
3. Attribution style can predict students' achievement in Biology.
4. Self-efficacy, study habits and attribution style jointly predict students' achievement in Biology.

### Research Questions

1. What is the predictive power of self-efficacy on students' achievement in Biology?
2. What is the predictive power of study habit on students' achievement in Biology?
3. What is the predictive power of attribution style on students' achievement in Biology?
4. What is the joint predictive power of self-efficacy, study habits and attribution style on students' achievement in Biology?

### Hypotheses

1. Self-efficacy does not significantly predict students' achievement in Biology.
2. Study habit does not significantly predict students' achievement in Biology.
3. Attribution style does not significantly predict students' achievement in Biology.
4. Self-efficacy, study habits and attribution style jointly do not significantly predict students' achievement in Biology.

### Method

The study adopted a correlational research design. The study was carried out in Ogidi Education zone in Anambra state. Population of the study comprised 2875 senior secondary school year two (SS2) students offering biology in 24 public secondary school in Ogidi Education zone in 2021/2022 academic session. The researcher made use of multistage sampling procedure to constitute a sample of 800 students for the study. In the first stage, 10 schools out of the 24 schools in the research area using simple random sampling technique. In the second stage, 80 students were drawn from each of the 10 schools also using

simple random sampling technique. In all, 800 SS2 students offering Biology were drawn to constitute the sample for the study.

The instruments for data collection are Students Self-efficacy scale, Study habit inventory and Attribution scales for students. Students' self-efficacy scale developed by Chen, Gully and Eden (2001) were used to assess the academic self-efficacy of the students and respondents to evaluate themselves against statements using values of agreement. The Chen, Gully and Eden students' self-efficacy scale was adapted and modified to a total of 25 in order to get information about students' self-efficacy beliefs relative to school success and to ensure it covers the school subject (biology) which is under study while the respond format was modified to: Really Agree (1), Kind of Agree (2), Kind of Disagree (3) and Really Disagree (4).

Students Study Habit Inventory (SSHI) adapted from Bakare (1977). Habit inventory was developed specifically for Nigerian secondary school students using existing inventory and published studies. It is a self-report inventory that consists of 35 question items tapping 8 sections of the study habit, covering homework and assignment, time location, reading, note taking. The response of each item was graded on a four-point scale. The possible responses to each item on the questionnaire are four (never, sometimes, most times and always) with scores 1, 2, 3, 4, respectively. The scores for all questions each was totaled and converted to stanine equivalent using the table of stanine norms for the SHI. The stanine equivalent of the total score on the inventory (that is addition of all sections scores) was provided as SHI. Bakare study habit was therefore modified and collapsed into just one section, numbering 25 with the responses: never, sometimes, most times and always with scores 1,2, 3, 4, respectively.

Attribution Scale for Students (ASS) developed by Kitila and Jacqueline, (2012) was used to measure the attribution level of the students. It has 10 items on a four-point scale response format ranging from: Strongly Agree, Agree, Disagree and Strongly Disagree. ASS was however modified to a 25 scale with four response options ranging from: usually (4), sometimes (3), really (2) and Never (1). ASS was adapted for this study to reflect appropriate secondary school students' attribution style in biology interest and academic achievement.

The cumulative result records of the SS2 students in their SS1 (2020/2021) academic session

were obtained and used because the study was carried out in first term of their SS2. This was used as a measure of students' academic achievement. The examination taken by the students in Anambra state are moderated by the state ministry of Education, hence the result from the termly examination is standard and uniform from it the annual cumulative is computed.

The instruments were validated by two lecturers in the Department of Science Education and Department of Educational Foundations, Nnamdi Azikiwe University, Awka. The reliability of the various scales was established with Cronbach Alpha and they yielded the following: students' self-efficacy scale = 0.889, students' study habit inventory = 0.748, and for students' attribution scale = 0.719. The researcher visited the schools and discuss with the principal to get permission to carry out the research. The instrument was

administered on the students by the researcher with the help of the biology teachers in the school to facilitate easy administration of the instrument. A total of 800 copies of the instrument was administered. The students were giving proper orientation on the mode of answering the questionnaire. This method ensured correct completion and high percentage return of completed questionnaire. The researcher also collected data on students' annual results of SS1 biology for their academic achievement. Multiple and simple linear regression analysis was used to analyze the research questions and test the null hypothesis at 0.05 alpha level. The decision rule was that where Pvalue was equals 0.05, the null hypotheses were rejected, otherwise, the null hypotheses were not rejected.

### Results

**Table 1: Model summary of regression of self-efficacy on achievements in Biology**

Model	Mean	Std. Deviation	N	R	R <sup>2</sup>	Unstandardized Coefficients(b)
Constant						45.589
Self-efficacy	72.2050	11.89579	800			0.302
Achievement in Biology	67.4068	34.64425	800	0.104	0.011	

Table 1 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' self-efficacy and achievement in Biology scores. From the table, R = 0.104 which indicates a weak positive relationship

between the two variables. Also, R<sup>2</sup> = 0.011 which implies that 1.1% of the variance in scores on students' achievement in Biology was accounted for by self-efficacy.

**Table 2: Regression ANOVA table for self-efficacy and achievement in Biology**

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	10323.734	1	10323.734		
Residual	948655.449	798	1188.791	8.684	0.003
Total	958979.184	799			

Table 2 shows the Analysis of Variance (ANOVA) of students' self-efficacy scores and their scores on achievement in Biology. From the table, F (1,798) = 8.684, P = 0.003 which is significant at 0.05  $\alpha$ -level since p<0.05. Hence, the null hypothesis is rejected and the alternative hypothesis which states that self-efficacy significantly predicts student's achievement in Biology was not rejected.

From Table 1 it can also be seen that the constant = 45.589 and b value = 0.302. Hence, the regression model (Y = a + bX) can be presented thus:  
BA = 45.589 + 0.302SE  
Where, BA = Biology Achievement and SE = Self-efficacy.

**Table 3: Model summary of regression of study habit on achievement in Biology**

Model	Mean	Std. Deviation	N	R	R <sup>2</sup>	Unstandardized Coefficients(b)
Constant						24.770
Study habit	60.2075	10.92903	800	0.223	0.050	0.708



Achievement in Biology	67.4068	34.64425	800
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Table 3 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' study habit and achievement in Biology scores. From the table,  $R = 0.223$  which indicates a weak positive relationship

between the two variables. Also,  $R^2 = 0.05$  which implies that 5% of the variance in scores on students' achievement in Biology can be accounted for by changes in study habit scores.

**Table 4: Regression ANOVA table for study habit and achievement in Biology**

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	47861.359	1	47861.359	41.919	.000 <sup>b</sup>
Residual	911117.824	798	1141.752		
Total	958979.184	799			

Table 4 shows the Analysis of Variance (ANOVA) of students' self-efficacy scores and their scores on achievement in Biology. From the table,  $F(1,798) = 41.919$ ,  $P = 0.000$  which is significant at 0.05  $\infty$ -level since  $p < 0.05$ . Hence, the null hypothesis is rejected and the alternative hypothesis which states that study habit significantly predicts student's achievement in Biology was not rejected.

From Table 3 it can also be seen that the constant = 24.770 and b value = 0.708. Hence, the regression model ( $Y = a + bX$ ) can be presented thus:

$$BA = 24.770 + 0.708SH$$

Where, BA = Biology Achievement and SH = Study Habit.

**Table 5: Model summary of regression of attribution style on achievement in Biology**

Model	Mean	Std. Deviation	N	R	R <sup>2</sup>	Unstandardized Coefficients(b)
Constant						65.728
Attribution Style	55.8638	10.59944	800	0.009	0.000	0.708
Achievement in Biology	67.4068	34.64425	800			

Table 5 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' attribution style and achievement in Biology scores. From the table,  $R = 0.009$  which indicates a very weak positive

relationship between the two variables. Although there is a relationship but,  $R^2 = 0.000$  which implies that less than 0.001% of the variance in scores on students' achievement in Biology can be accounted for by changes in scores on attribution style.

**Table 6: Regression ANOVA table for attribution style and achievement in Biology**

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	82.237	1	82.237	.068	.794 <sup>b</sup>
Residual	958896.947	798	1201.625		
Total	958979.184	799			

Table 6 shows the Analysis of Variance (ANOVA) of students' attribution style scores and their scores on achievement in Biology. From the table,  $F(1,798) = 0.068$ ,  $p = 0.794$  which is not significant at 0.05  $\infty$ -level since  $p > 0.05$ . Hence, the null hypothesis which states that attribution style does not significantly predict student's achievement in

Biology is retained and the alternative hypothesis is rejected.

From Table 5 it can also be seen that the constant = 65.728 and b value = 0.30, Hence, the regression model ( $Y = a + bX$ ) can be presented thus:

$$BA = 65.728 + 0.3AS$$

Where, BA = Biology Achievement and AS = Attribution Style.

**Table 7: Model summary of regression of self-efficacy, study habit and attribution style on achievement in Biology**



Model	Mean	Std. Deviation	N	R	R <sup>2</sup>	Unstandardized Coefficients(b)
Constant						19.388
Self-efficacy	72.2050	11.89579	800			.074
Study Habit	60.2075	10.92903	800	.225	.051	.679
Attribution Style	55.7388	10.65058	800			.032
Achievement in Biology	67.4068	34.64425	800			

Table 7 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students’ self-efficacy, study habit, attribution style and interest in Biology scores. From the table, R = 0.225 which indicates a weak positive relationship among all the variables. Also,

R<sup>2</sup> = 0.051 which implies that only about 5.1% of the variance in scores on students’ achievement in Biology can be accounted for by the changes in scores on self-efficacy, study habit and attribution style jointly.

**Table 8: ANOVA table for self-efficacy, study habit, attribution style and achievement in Biology**

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	48531.428	3	16177.143		
Residual	910447.756	796	1143.779	14.144	0.000
Total	958979.184	799			

Table 8 shows the Analysis of Variance (ANOVA) of students’ self-efficacy, study habit, attribution style scores and their scores on achievement in Biology. From the table, F (3,796) = 14.144, p = 0.000 which is significant at 0.05 ∞-level since p<0.05. Hence, the null hypothesis is rejected and the alternative hypothesis which states that self-efficacy, study habit and attribution style jointly, significantly predicts student’s achievement in Biology was not rejected.

From Table 7 it can also be seen that the constant = 19.388 and b for values for self-efficacy, study habit and attribution style = 0.074, 0.679 and 0.032 respectively. Hence, the regression model (Y = a + bX<sub>1</sub> + cX<sub>2</sub> + dX<sub>3</sub>) can be presented thus:

$$BA = 19.388 + 0.074SE + 0.679SH + 0.032AS$$

Where, BA = Biology Achievement, SE = Self-efficacy, SH = Study Habit and AS= Attribution Style.

**Discussion**

The findings of the study revealed that self-efficacy positively predicted Biology achievement. This implies that an increase in self-efficacy would lead to increased students Biology achievement. From the findings of the regression analysis, the statement of hypotheses 5 is rejected showing that self-efficacy belief of secondary students significantly predicts their biology achievement. The positive relationship found between self-efficacy and Biology achievement is not surprising because students with a high sense of self-efficacy

are more likely to challenge themselves with difficult tasks and be intrinsically motivated. These students will invest a high degree of efforts in order to meet their commitments. Students with low self-efficacy on the other hand believe they cannot be successful and thus are less likely to make a concerted and extended efforts and may consider challenging tasks as threats that are to be avoided. Thus, students with low self-efficacy have low aspirations which may result in low Biology achievement.

This result is in agreement with Onyезigbo (2010) who found that high self-efficacy seems to influence academic persistence necessary to maintain high academic achievement. Research findings have suggested that learners who possess high self-efficacy achieves better in their academic endeavor (Viko, 2010). However, there were also few researchers who reported that academic achievement is unpredicted of self-efficacy. This goes to show that even though self-efficacy related positively with students’ achievement in Biology, the relationship is not significant. This means that one cannot use knowledge of students’ self-efficacy to predict what their achievement in Biology would likely be. This study therefore suggests the need to help secondary school students overcome every problem associated with self-efficacy. Such help and efforts by parents and teachers will go a long way to increase students’ achievement in Biology and at the same time help students build their own capability.

The findings revealed that students' study-habit had positive relationship with Biology achievement. From the analysis study habits contributed moderately to the variance in Biology achievement. The implication of this study is that the more students develop a good study habit, the more they achieve well. From the result of the regression analysis, the statement of hypotheses 6 is rejected showing that study habit significantly predicts their biology achievement. The findings are not surprising because individuals with good study habit try to avoid behavior that often interfere with performance in everyday life as well as in academic situations. Individuals with good study habit perform well than those with bad study habit, especially when tests are given.

This result collaborated the result of Onuekwe (2011) who carried out a study on the influence of study habits on academic performance of students of economics in junior secondary school in Enugu state. The result showed that study habit and academic achievement has a significant relationship. However, Jasqueet (2020) conducted research to explore the connection between study habit and academic achievement of secondary school students across various schools in the city of Ludhiana. The result of the findings revealed that a negative correlation exists between the two variables. Therefore, study habit is one of the variables responsible for students' achievement in Biology but it can be managed by training of students by inculcating good study habits.

Findings showed that attribution style is negative predictor of Biology achievement and contributed little to the variance in Biology achievement. The implication of this is that the more students attribute their success and failure to external factors, the more they achieve poorly. From the findings of the regression analysis, the statement of the hypotheses which states that attribution style does not significantly predict students' achievement in Biology is accepted.

The result collaborated with the findings with Aminus and Aisha (2015) that carried out a research to examine the relationship between casual attribution and academic attainment in North central Nigeria. The result of the findings showed that there is no significant relationship identified among the casual attribution and academic attainment. However, the findings of Mehdi *et al* (2013) who carried out a research to examine the relationship between attribution style and personality characteristics and academic performance in Bandar Abbas high school students

revealed that there is a positive correlation between attribution style and academic performance. This by implication goes to show that knowledge of students' attribution styles cannot predict actually what their achievement in Biology would likely be. However, students understanding their attribution style may help them improve their academic performance. This process can be done through attribution retraining program. The program attempt to enhance motivation.

The findings of this study present a summary of the multiple regression analysis among the predictor variables when combined together. The result showed that the three variables positively predicted Biology interest. Only self-efficacy and study habits however predicted students' achievement in Biology while attribution style does not significantly predicted achievement in Biology. Working together, the three variables significantly predicted interest and achievement in Biology. This by implication goes to show that knowledge of students' self-efficacy, study habit and attribution style can jointly predict what their Biology interest and achievement would likely be. This is attested to by the beta coefficient of the multiple regression analysis. This suggests the need to help secondary school students overcome every problem associated with these variables. Such help and efforts by parents and teachers will go a long way to increasing students' interest and achievement in Biology and at the same time help students to believe in their capabilities, attribute their success and failure to internal factors and maintain good study habit.

### Conclusion

Based on the findings of the study, it was concluded that self- efficacy and study habits positively and significantly predicted students' achievement in biology whereas attribution style does not significantly predict achievement. Moreover, when jointly combined, the three variables significantly predicted achievement in Biology.

### Recommendations

1. An efficacy and study habit were found to positively and significantly predict Biology achievement. School management and teachers should equip the students with knowledge and skills and given them opportunity that will improve their self-efficacy and study habits.
2. There should be frequent public enlightenment campaign on the importance of self-efficacy

and attribution styles. This enlightenment campaign should be carried out at the national, state and local government levels by the government through the ministries of education.

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