

Self-Efficacy, Study Habit and Attribution Style Aspredictors of Senior Secondary School Students’ Interest 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’ interest in Biology in Ogidi Education zone, Anambra state. Four research questions guided the study and four null hypotheses were tested at 0.05 level of significance. Correlational research design was adopted in the study. The population of the students was 2,875 Biology students in Ogidi Education zone. The sample for the study was 800 Biology students. Students Self-Efficacy Scale (SSES), Study Habit Inventory (SHI), Attribution Style for Students (ASS) and Biology Interest Rating Scale (BIRS) were developed and administered as instruments for data collection. The instruments were validated by three experts and the reliability coefficient of SSES, SHI, ASS and BIRS were established using Cronbach’s Alpha to be 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 that students’ interest in biology was significantly predicted by self-efficacy, study-habit and attribution style individually and jointly. It was recommended that biology teachers should be sponsored on seminars, workshop and conferences associated with psychological constructs (self-efficacy, study habits and attribution styles) by the government so as to encourage the students to maintain high level of self-efficacy and good study habits.*

Keywords: *self-efficacy, study-habit, attribution style, achievement, Biology*

Date of Submission: 06-02-2022

Date of Acceptance: 20-02-2022

I. Introduction

Biology is a branch of knowledge that deals with living things and their vital processes. It is a requirement for further learning, training and development for many science-related professional courses such as Pharmacy, Medicine, Biotechnology, Botany, Zoology, Agriculture, Biomechanics and Ecology. Biology finds application in development of vaccines and drugs for preventing and combating diseases, in plants and animals’ improvement, in transporting organs of the body, in controlling pests using biological control, in manufacturing of single cell protein by micro-organism to combat protein deficiency. Biology is an experimental science whose study involves exploration of relationship between plants and animals and their environments.

Several efforts have been made by teachers and educational researchers to improve student interest in Biology since the subject is no longer compulsory, but the trend has not changed. So many other research works have been carried out in these areas but yet no remarkable improvement. This could be because not much has been done on the implicated factors relating to the students’ interest such as the role of self-efficacy, study habit and attribution styles. Therefore, the study on the self-efficacy, study habits and attribution style as predictors of secondary school students’ interest in Biology is considered imperative as it will provide empirical evidence on the extent the variables affect interest in Biology singly and jointly.

Self-efficacy represents to belief in one’s capability to organise and execute the causes of action required producing given attainment (Bandura, 2007). According to Bandura, self-efficacy belief influences the causes of action people choose to pursue, how long they will persevere in the face of obstacles and failures, how they use their abilities and skills in specific circumstances and domains, their resilience to adversity, their thought patterns, how much stress and depression they experience in coping with environmental demands, and the level of accomplishment they realise (Bandura, 2007). Humans make life decisions based on our perceived self-efficacy by understanding activities and choosing situations we deem to be within our capabilities for success (Bandura, 2013).

Pajeres and Schunk (2001) and Usher and Pajeres (2006) have reported that students believe in their abilities to achieve goals strongly influence their academic achievement. In the view of this, Finn and Frone (2004) concluded that self-efficacy reflects the extent to which students believe they can successfully perform in school. They found that students’ mathematical self-efficacy belief was predictive of their choice of engaging in

subtraction problems other than in a different types of task: the higher the children's sense of efficacy, the greater their choice of arithmetic activity. Students' belief about their efficacy to manage academic task demand can also influence them emotionally by decreasing their stress, anxiety and depression. Thus, self-efficacy defines for a student subjects to be interested in especially when they perceive that they can handle the subject. Despite high self-efficacy in a particular subject, a student must develop a good study habit for subject of their interest.

Study habit are the behaviors used when preparing for tests or learning academic materials. A person who waits until the very last night before an examination and then stays up all night trying to cram the information into his head is an example of someone with bad study habit. Each student has different methods and ways of studying and these methods are sometimes helpful but some are not as effective as the others (Oppaper, 2010). Good study habit helps the student to gain much affective learning that profit even more. Students who perform well in classes and who are academic outstanding are proof that they have good study habit. This is because study habit involves using organisational techniques of learning which exercise the particular talents and aptitudes of students (Research clue, 2018). Each student as a unique individual has different abilities, approaches and ways of thinking, interests and ways of studying lessons. These individual differences have significant influence on one's learning style and acquisition (Oppapers, 2010). These ways of studying are the habitual way of studying by the learner.

Inefficient study habit increases the probability that study work is perceived as difficult and aversive, however, research indicates that good study habit may not be sufficient to remedy academic problems but may be mediated by self-efficacy (Dunlosky and Rawson, 2013). Students confront a challenging situation in their academic life, as educational environment requires competencies related to study work, however, only few students have received instruction on study habit (Dunlosky *et al*, 2015). Although, research on the effects of study habit and self-efficacy on academic achievement is becoming increasingly more available, schools seem to be slow in adopting them (Goffe and Kauper, 2014). There are however, a few studies on how self-efficacy and study habit may be moderated by attribution style.

Attribution style refers to the ways in which people explain the causes of events within their lives. When people experience positive or negative events, they often wonder why the event occurred. In order to answer this question, people make casual attributions based upon three basic dimensions : internal-external, stable-unstable, and global-specific. The internal-external domain refers to who or what is responsible for the event-in particular, whether something unique about the person (internal) versus something about the situation (external) caused the event. The stable-unstable domain refers to the perceived permanence of the cause. (Rodriguez *et al*, 2010). In other words, the cause of an event can be viewed as constant and likely to happen again (stable).

Individual differences exist in attribution and the types of attribution we tend to make about both ourselves and others. Individual differences in attribution style can influence how we respond to the negative and positive events that we experience. People who have extremely negative attribution styles, in which they continually make external, stable, and global attribution for their behavior are said to be experiencing learned helplessness. Development also plays a role in attribution, young children and older adolescents have different understanding of concepts, such as ability that are central to attribution theory. Consequently, attribution may take a different means for students at different stages of cognitive development and thereby influence their interest in different subjects.

Interest according to Harbor-Peters (2001) is a subjective feeling of concentration over a task. It is the preference for a particular type of activity. One is likely to do well in a discipline of interest. Interest according to Igboanugo (2013) is an important variable in learning. This is because when one becomes interested in an activity, one is likely to be deeply involved in that activity. For instance, once a student has his/her interest on a topic, the student spends more time learning about it and spend quality time exploring it by setting dedicated periods aside just for that one topic, to better understand it. There is however need to teach Biology in a way to arouse and sustain the interest. Students' interest are influenced by environmental, emotional and cognitive factors alongside their previous experiences. Some of these factors include self-efficacy, study-habit and attribution style. Thus, a student discovering his/her academic interest will pay more attention in class. Fatemeh and Camelial (2018) are of the view that students learn only what they have interest in.

PURPOSE OF THE STUDY

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

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

RESEARCH QUESTIONS

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

HYPOTHESES

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

II. Method

The study adopted a predictive correlational research design. A predictive correlation reflects the strength and/or direction of the relationship between two or more variables and it can measure variance on the outcome of variables relative to variance on the predictor variables. The study was carried out in Ogidi Education zone in Anambra state. There are six education zones, namely; Ogidi Education zone, Onitsha Education zone, Otuocha Education zone, Aguata Education zone, Awka Education zone and Nnewi education zone. Ogidi education zone was chosen because there are many public secondary school in the area that need to understand how self-efficacy, study habit and attribution style relate with their academic interest and academic achievement in biology.

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 technique 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.

Students Self-efficacy scale, Study habit inventory, Attribution scales for students, and Biology rating interest scales were used as instruments for data collection. Students self-efficacy scale developed by Chen, Gully and Eden (2001) will be used to assess the academic self-efficacy of the students. The instrument has a total of 17 items on a four-point scale response format: Strongly Agree (4), Agree (3), Disagree (2), Strongly Disagree (1). It requires the 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 consist of 35 question items tapping 8 sections of the study habit, covering homework and assignment, time location, reading, note taking. The responses 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 (i.e 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 Biology Interest Rating Scale (BIRS) was developed by Renninger and Hidi (2016). It has a total of 26 items with a six point likert type scale ranging from Strongly Agree (1), Moderately Disagree (2), Slightly Agree (3), Moderately Agree (4), Mostly agree (5) and Strongly Agree (6). This study adapted BIRS and modified it into 20 items and four response options. This study predicted that four response options would help to reduce the ceiling effect and result in a higher variation of responses. The response options used in this study are Strongly Agree (4), Moderately Agree (3), Moderately Disagree (2), and Strongly Disagree (1).

The instruments were validated by experts from the Department of Science Education and Department of Education Foundations, Nnamdi Azikiwe University, Awka. The reliability of the instrument was established using Cronbach Alpha reliability co-efficient. The choice of Cronbach's Alpha for SSES, SSHI and ASS is because they are polytomously scored. The instruments were administered to 30 SS2 Biology students in Obosi in Ogidi education zone who are not involved in the study. The scores generated were collated for each student and the formulae applied respectively to compute the internal consistency of each instrument. The reliability of the various scales was established with Cronbach Alpha and they yielded the following: for students' self-efficacy scale= 0.889, for students' study habit inventory= 0.748, for students' attribution scale= 0.719 and for students' interest scale= 0.966.

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.

III. Results

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

Model	Mean	Std. Deviation	N	R	R ²	Unstandardized Coefficients(b)
Constant						14.391
Self-efficacy	72.2050	11.89579	800			0.544
Achievement in Biology	53.6475	10.09458	800	0.641 ^a	0.410	

Table 1 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' self-efficacy and interest in Biology scores. From the table, R = 0.641 which indicates a strong positive relationship between the two variables. Also, R² = 0.41 which implies that 41% of the variance in scores on students' interest in Biology can be accounted for by changes in self-efficacy scores.

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

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	33420.929	1	33420.929		
Residual	47997.666	798	60.147	555.650	.000 ^b
Total	81418.595	799			

Table 2 shows the Analysis of Variance (ANOVA) of students' self-efficacy scores and their scores on interest in Biology. From the table, F(1,798) = 555.650, 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 significantly predicts student's interest in Biology is accepted.

From Table 1 it can also be seen that the constant = 14.391 and b value = 0.544. Hence, the regression model (Y = a + bX) can be presented thus:

$$BI = 14.391 + 0.544SE$$

Where, BI = Biology Interest and SE = Self-efficacy

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

Model	Mean	Std. Deviation	N	R	R ²	Unstandardized Coefficients(b)
Constant						22.572
Study habit	60.2075	10.92903	800			0.516
Achievement in Biology	53.6475	10.09458	800	0.559	0.312	

Table 3 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' study habit and interest in Biology scores. From the table, R = 0.559 which indicates a moderate

positive relationship between the two variables. Also, $R^2 = 0.312$ which implies that 31.2% of the variance in scores on students' interest in Biology can be accounted for by changes in study habit scores.

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

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	25423.468	1	25423.468		
Residual	55995.127	798	70.169	362.316	0.000 ^b
Total	81418.595	799			

Table 4 shows the Analysis of Variance (ANOVA) of students' self-efficacy scores and their scores on interest in Biology. From the table, $F(1,798) = 362.316$, $p = 0.000$ which is significant at 0.05 ∞ -level since $p < 0.05$. Hence, the null hypothesis is rejected and the alternative hypothesis which states that study habit significantly predicts student's interest in Biology, is accepted.

From Table 3 it can also be seen that the constant = 22.572 and b value = 0.516. Hence, the regression model ($Y = a + bX$) can be presented thus:

$$BI = 22.572 + 0.516SH$$

Where, BI = Biology Interest and SH = Study Habit.

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

Model	Mean	Std. Deviation	N	R	R ²	Unstandardized Coefficients(b)
Constant						48.710
Attribution Style	55.8638	10.59944	800			0.088
Achievement in Biology	53.6475	10.09458	800	0.093	0.009	

Table 5 shows the summary of the descriptive statistics, the regression analysis and the beta coefficients of students' attribution style and interest in Biology scores. From the table, $R = 0.093$ which indicates a weak positive relationship between the two variables. Also, $R^2 = 0.009$ which implies that only about 0.9% of the variance in scores on students' interest in Biology can be accounted for by changes in scores on attribution style.

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

Model	Sum of Squares	Df	Mean of Squares	F	Sig
Regression	701.350	1	701.350		
Residual	80717.245	798	101.149	6.934	0.009
Total	81418.595	799			

Table 6 shows the Analysis of Variance (ANOVA) of students' attribution style scores and their scores on interest in Biology. From the table, $F(1,798) = 6.934$, $p = 0.009$ which is significant at 0.05 ∞ -level since $p < 0.05$. Hence, the null hypothesis is rejected and the alternative hypothesis which states that attribution style significantly predicts student's interest in Biology, is accepted.

From Table 5 it can also be seen that the constant = 48.710 and b value = 0.088, Hence, the regression model ($Y = a + bX$) can be presented thus:

$$BI = 48.71 + 0.088AS$$

Where, BI = Biology Interest and AS= Attribution Style.

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

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

Model	Mean	Std. Deviation	N	R	R ²	Unstandardized Coefficients(b)
Constant						0.334
Self-efficacy	72.2050	11.89579	800			0.426
Study Habit	60.2075	10.92903	800	0.731	0.534	0.349
Attribution Style	55.7388	10.65058	800			0.028
Achievement in Biology	53.6475	10.09458	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, $R = 0.731$ which indicates a strong positive relationship all the variables. Also, $R^2 = 0.534$ which implies that about 73.1% of the variance in scores on students' interest 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	43508.746	3	14502.915		
Residual	37909.849	796	47.625	304.520	0.000
Total	81418.595	799			

Table 8 shows the Analysis of Variance (ANOVA) of students' self-efficacy, study habit, attribution style scores and their scores on interest in Biology. From the table, $F(3,796) = 304.520$, $p = 0.000$ which is significant at 0.05 α -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 interest in Biology is accepted.

From Table 4.7 it can also be seen that the constant = 0.334 and b for values for self-efficacy, study habit and attribution style = 0.426, 0.349 and 0.028 respectively. Hence, the regression model ($Y = a + bX_1 + cX_2 + dX_3$) can be presented thus:

$$BI = 0.334 + 0.426SE + 0.349SH + 0.028AS$$

Where, BI = Biology Interest, SE = Self-efficacy and AS= Attribution Style.

IV. Discussion

The findings of the study revealed that self-efficacy positively predicted Biology interest. The positive relationship found between self-efficacy and Biology interest show 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 academic demand. Students with low self-efficacy on the other hand believe they cannot be successful and thus ignore challenging tasks and fail to develop good morale in academics. Thus students with low self-efficacy have low aspirations which may result in low Biology achievement.

This result is in agreement with Patrick, *et al* (2003) who found that there is a moderate correlation between self-efficacy and academic interest. In turn, Ken and Akbas (2016) However, when determining students level of interest and self-efficacy in Chemistry pointed out that previous experiences in the area of interest positively predict the levels of self-efficacy in the domain, as well as interest in an area can predict the levels of self-efficacy. This means that one cannot use knowledge of students' self-efficacy to predict what their interest 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' interest in Biology and at the same time help students build their own capability.

V. Conclusion

Based on the findings of the study, it was concluded that self-efficacy, study habits and attribution styles positively and significantly predicted Biology interest. However, some factors are contributing more to students in Biology other than self-efficacy, study habits and attribution style. Moreover, when combined, the three variables significantly predicted interest in Biology.

VI. Recommendations

1. Biology teachers should be sponsored on seminars, workshop and conferences associated with psychological constructs (self-efficacy, study habits and attribution styles) by the government so as to encourage the students to maintain high level of self-efficacy and good 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.

References

- [1]. Bandura, A. (2007). Self-efficacy belief as shaper of children's aspirations and career trajectories. *Child development*, 72,187-207.
- [2]. Bandura, A. (2013). *Self-efficacy in changing societies*. London: Cambridge university press.
- [3]. Dunlosky, J. & Rawson, N (2013). *Improving students learning with effective learning techniques: promising directions from cognitive and educational psychology*. Retrieved from <http://doi.org/10.1177/is29100612453266>.

- [4]. Dunlosky, J. (2015). Practice test, spaced practice and successive learning: tips for classroom use and for guiding students' learning. *Scholarship of teaching and learning in psychology*, 1(1), 72-78.
- [5]. Fatemeh, V. and Camelis, T. (2018). The effects of teaching based on dominant learning styles in nursing students' academic achievements. *Nurse Education in Practice*, 28, 11-17.
- [6]. Finn, K.V. & Frone, M. (2004). Moderating role of school identification and self-efficacy. *The Journal of Educational Research*, 97(3), 115-172.
- [7]. Goffe, W. & Kamper, D. (2014). A survey of principles instructors. why lecture prevails. *Journal of Economics Education*, 45(5), 12-18.
- [8]. Harbor-peters, V.F. (2010). *Unmasking some aversive aspects of school mathematics and strategies for averting them*. An open access and academic publisher.
- [9]. Igboanugo, B.I. (2013). *Effects of peer teaching on students' achievements and interest in senior secondary school difficult chemistry concept*. unpublishedarticle.
- [10]. Ken, A. & Akbas, A. (2016). Affective factors that influence chemistry achievement and the power of these factors to predict chemistry achievement. *Journal of Turkish Science Education*, 3(1), 76-85.
- [11]. Oppapers, C. (2010). *Conflict management in the workplace*. Retrieved from <http://www.oppapers.com/essays/management-workplace/100184>.
- [12]. Pajeres, F. & Shunk, D.H. (2011). Self-belief and school success; self-efficacy, self-concept and school achievement. In Riding and S. Rayer (Eds), *Perception* (239-266). London: Ablex publishing.
- [13]. Rodriguez, A.A., Vazquez, M., Olivares, J. & Valencia, E. (2010). Agriculture, university. *P. R*, 94(1-2), 121-130.
- [14]. Usher, E.L. & Pajeres, F. (2006). Sources of academic and self-efficacy beliefs of entering middle school students. *Contemporary Educational Psychology*, 3 (2), 125-141.

Udegbe Stellamaris Ifeoma. "Self-Efficacy, Study Habit and Attribution Style Aspredictors of Senior Secondary School Students' Interest in Biology in Ogidi Education Zone." *IOSR Journal of Research & Method in Education (IOSR-JRME)*, 12(01), (2022): pp. 46-52.