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PARENTAL INVOLVEMENT AND SELF-EFFICACY AS PREDICTORS OF SECONDARY SCHOOL STUDENTS' INTEREST IN BIOLOGY

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ABSTRACT

This study explored the predictive powers of parental involvement and self- efficacy on secondary school student's interest in Biology in Nsukka Education Zone. Three research questions guided the study whereas three null hypotheses were tested at 0.05 alpha level of significance for this study. The study employed a correlation survey research method. A total of 1,529 secondary school two (SS2) Biology students distributed in 62 public secondary schools in the zone constituted the population of the study. The sample size was 475 students drawn using multistage sampling procedure. Three adapted structured questionnaires titled Parental Involvement Questionnaire (PIQ), Self-Efficacy Questionnaire (SEQ) and Biology interest inventory (BII) were the instruments used for data collection. The reliability of the instruments was established using Cronbach's alpha method. The reliability coefficient values obtained were 0.89 for PIQ, 0.83 for SEQ and 0.90 for BII. The results revealed, among other things, that, secondary school students' parental involvement was significant predictor of students' interest in Biology. Based on the findings of the study, recommendations were made.

KEYWORDS

Parental involvement, self-efficacy, interest, biology.

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Introduction

Biology is the science of life and science of living organisms. Umar (2011) defined biology as a natural science that deals with the living world: how the world is structured, how it functions and what these functions are, how it develops, how living things came into existence, and how they interact with one another and with their environment. Okoyefi (2014) also refers to biology as an integral part of natural science that deals with the living world; the study of living organisms, their structures, compositions, growth forms, functions, evolution, distribution and interrelationships. Biology is one of the senior secondary school subjects taught in Nigeria, the knowledge of biology enables students to understand the nature of the universe their relationships and interaction of living organisms within their non- living environment.

Biological science has provided some of the most important unifying themes for the whole human existence in the family. Biology has made us to understand while genes, heredity/ trait transmission and variation in genes can transmit from parent to offspring in living organisms. Kaill, R, Malanchin, M, Krapoohi, E. Laurie, J. Hannigan, P. Dale, S. and Plomin, R., (2018) explains why some characteristics, from parents such as intelligence, skin colour, shape of hairline are inherited or run among siblings of the same parents in a family. Parenting- family is a fundamental factor, which contributes to a child's development. For a child, the family is the first social and educational environment. Therefore, a right beginning is the one that makes the most important part of a child's education. A child's education is the shared responsibility of the school and the family outside the school; the family is the most prominent/relevant source of learning, encouragement and support for a child. Educational influences of families on children may manifest either directly - through more or less directed actions, or indirectly - through behaviour models offered by parents or family members and through the existing psychosocial climate in the family. These more or less conscious educational strategies of families determine personality interest, development and educational achievement of children, and are largely dependent on parental involvement.

Parent is one who brings up and cares for a child. The involvement of parents in the education and intellectual development of their children can have a considerable influence on their academic performance and life experience. The term "parental involvement" refers to a variety of parental behaviours that directly or indirectly influences children's cognitive development and academic achievement. Abie (2018) refers to parental involvement to a situation where parent are directly involved in the education of their children, with the partnership of teachers in the learning process of their children. Abie also refers parental involvement to direct involvement of parents in education of their children through fulfilling their duties as parents, by ensuring that their children are assisted in the process of learning. Parental involvement is also the engagement of parents in education of their children in order to achieve a positive academic result.

Parental involvement is essential for student development and it offers many benefits. For examples, according to Newchurch (2017), children achieve higher completion rate in homework, organize and monitor their time and develop more positive interest toward schoolwork; When parents are involved in their children's education both parents and children are likely to improve relationships between them as well as helping students to develop positive interest towards school and a better understanding of the schooling process. It also helps improve student behaviour in the classroom.

School and family partnerships of parental involvement are not a one size fits all model (should be example to copied); numerous factors go into the level of parental involvement and

understanding, in the school programme (McWayne and Melzi, 2014). Parents should make it first priority to guide children, teach them how to work hard, but allow them to follow their right path because the best school of discipline is family. Parents are their children's first teachers, if children are to be successful in school, Parents must be actively involved in their children's academic lives. By increasing parental involvement, student's academic life and their self-efficacy could improve.

Self-efficacy determines how people feel, think, motivate themselves and behave. Self-efficacy is the ability of a learner to succeed in a specific task. Keskin (2014) refers to self-efficacy as task, When students face new tasks, they ask themselves "can I perform this task (self- efficacy) and "why should I do this task" (task value). A strong sense of efficacy enhances human accomplishment and personal wellbeing in many ways and learners, who doubt their capabilities, shy away from difficult tasks as challenges to be mastered and rather see them as threats to be avoided. McConnel (2014) research findings have shown that self-efficacy is important in learning difficult subjects, such as biology and other sciences, given that students enter courses with varying levels of fear and anxiety. According to Bandura, learners can develop self-efficacy in four main sources. These include: mastery experience, vicarious experience, verbal persuasion and physiological and affective states. Generally, self-efficacy is influenced by four main sources: mastery experience—that is, hands-on experience; Success leads to additional successes and failure can cast doubt on the outcome of future attempts. Vicarious experiences—that is, other people's experience;"If they can do it, I can do it as well" Ahemed, Abdulazizi &Eldood (2015 p 276). Verbal persuasion—that is, appraisal or feedback from others; it is a way of strengthening people's belief that they have what it takes to succeed. And physiological and affective states—that are stress, emotion, mood, pain, and fatigue (Sharma and Nasa, 2014). Self-efficacy is a key contributing factor to learners' success because the experience obtained influences the choices learners make and the courses of action they pursue. From the foregoing, it can be said that self-efficacy could influence students' interest by applying better learning strategies.

Self-efficacy according to Shazia (2014) is considered as a key criterion to judge one's total potentialities and capabilities. Newchurch, (2017) indicate that the educational practices of parents and their impact on the intellectual, social and emotional development of the children could influence their interest in Biology. The parental involvement and their self-efficacy as predictors are assumed to influence students' interest at all levels including secondary level. According to Bandura, learners can develop self-efficacy in four main sources. These include: mastery experience, vicarious experience, verbal persuasion and physiological and affective states.

Interest is an important component of motivation and has been valued as a key to academic achievement. Interest according to Harackiewicz, Smith, and Priniski (2016) is a very powerful motivational process that energizes learning, guides academic and career path, and is essential to academic achievement. Ashley, Knekta, and Corwin (2019) defined interest as arousing or inducing attention, engagement and curiosity in a person. Interest has both psychological state of attention and affect toward a particular topic, and an enduring tendency to re-engage over time. Thorndike, an instrumental conditioning psychologists stated in his "Law of Readiness and Maturation" that instructional content should be based on the learners' psychological readiness. That is to say, that learner will be interested in the instructional materials and learn better if the content and the instructional approach are relevant to their cognitive level.

Statement of the Problem

Considering the importance of Biology for scientific and economic development of nations, students are expected to demonstrate high interest in learning Biology which would in turn bring about high achievement in Biology. Unfortunately, evidences have shown that secondary school students' achievement in Biology does not commensurate with the expectation of the society regarding the students' performance in the subject. As a matter of fact, poor achievement of students in Biology is noted to have become a recurring decimal. The debilitating consequences of persistent poor performance of students in Biology are that many students may not actualize the desired academic careers in medical related disciplines, many students may even eventually become frustrated about education, and many students may even become school dropouts and become threat to the society. Researcher, although have attempted solving the problem, the problem has persisted, thereby calling for more lasting solutions. Hence, the problem of this study put into the interrogative is, "to what extents do the level of parental involvement, and self-efficacy predicts secondary school students' interest in Biology?

Purpose of the Study

The general purpose of the study is to ascertain the parental involvements and self-efficacy as predictors of secondary school students interest in Biology. Specifically, the study seeks to examine the extent to which:

1. parental involvement predicts students' interest in Biology.
2. self-efficacy predicts students' interest in Biology.
3. parental involvement and self-efficacy predicts students' interest in Biology.

Research question

The following research questions guided the study:

1. to what extent does parental involvement predict students' interest score in Biology?
2. to what extent does self-efficacy predict students' interest score in Biology?
3. to what extent do parental involvement and self-efficacy predict students' interest in Biology?

Hypotheses

The following hypotheses guided the study at 0.05 level of significance:

Ho_1: Parental involvement is not a significant predictor of students' interest in Biology.

Ho_2: Self-efficacy is not a significant predictor of students' interest in Biology.

Ho_3: Parental involvement and self-efficacy are not significant predictors of students' interest in Biology.

Methodology

Correlation survey research design was adopted for the study. Correlation survey research design is considered suitable because the study aims at relating two or more variables to ascertain their influence on one another (Creswell, 2012). The study was carried out in Nsukka Education Zone of Enugu State. Nsukka Education Zone is made up of three Local Government areas namely; Igbo-Etiti Local Government, Uzo-uwani Local Government and Nsukka Local Government. The population of the study constituted all the senior secondary students' two (SS2) students offering Biology in the 62 public schools in Zone. The population of SS2 students in the zone is 1,529 (Post-primary School Management Board, Nsukka, 2023). The sample size of 475 SS2 students was selected from the 62 public secondary schools using multi stage sampling techniques, simple random

by balloting and purposive sampling procedure. There are three instruments for data collection for this study namely; Parental Involvement Questionnaires (PIQ), Self-Efficacy Questionnaires (SEQ) and Biology Interest Inventory (BII). The instruments are grouped into three (3) clusters, first cluster (cluster A) is the PIQ and contains 20 items that measures students' opinion on parental involvement (adopted from Epstein, 2005). The second clusters, (cluster B) is the SEQ and equally contains 20 items that measure students' self-efficacy (adopted from Bandura, 1977). The third instrument for the study is Biology Interest Inventory (BII). The questionnaires on PIQ, SEQ and the BII were validated by three experts;one from Department of Science Education, one from Department of Educational Foundations (Measurement and Evaluation unit), and one from (guidance and counseling)all in the Faculty of Education, Nnamdi Azikiwe University Awka. The data collected were analyzed using Conbach's Alpha reliability co-efficient. The internal consistency reliability estimates of 0.89 for parental involvement, 0.83 for self- efficacy and 0.90 Biology interest inventory were obtained. The data collected was analyzed using Correlation Co-efficient simple and multiple regressions to answer the research questions while regression analysis of variance was used to test the hypotheses at 0.05 level of significance.

Results

Research Question One: to what extent does parental involvement predicts students' interest scores in Biology?

Table 1: Pearson Correlation Coefficient showing the Amount of Variance in Students' Interest in Biology that is accounted for by Students' Parental Involvement

Model	r	r^2	Adjusted R Square	Std. Error of the Est.
1	0.093[a]	0.01	0.007	6.03434
a. Predictors: (Constant), PI, *PI=Parental Involvement*				

Table 1 shows that the Pearson correlation coefficient was weak and positive for the relationship between students' parental involvement and students' interest in Biology *(r=0.093)*. The positive linear relationship between the two variables indicates that the higher the students' parental involvement improved, the higher the students' interest in Biology. However, the $r^2$was 0.01 indicating that the one percent variance in students' academic interest was explained by the variance in students' parental involvement was very negligible. To ascertain whether the amount of variance in students' interest that was accounted for by students' parental involvement was significant, analysis of variance for the model was examined.

Hypothesis One (Ho_1): Parental involvement is not a significant predictor of students' interest scores in Biology.

Table 2: A test for the Significant in the Amount of Variance in Students' Interest in Biology that is Accounted for by Students' Parental Involvement

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	150.328	1	150.328	4.128	0.043 [b]
	Residual	17223.449	473	36.413		
	Total	17373.777	474			

a. Dependent Variable: BI
b. Predictors: (Constant), PI

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	46.097	2.207		20.888	0.000
	PI	0.066	0.032	0.093	2.032	0.043

a. Dependent Variable: BI

BI=Biology Interest, PI =Parental Involvement

Table 2 shows the simple linear regression conducted to predict students' academic interest in biology based on students' parental involvement. The regression equation was significant *(F(1,473)= 4.128, P=0.043 <0.05)* with an r^2 of 0.01. The students' predicted achievement score was equal to *46.097+0.066 (PI)*. Students' average achievement in Biology score increased by 0.066 for each unit increased in students' parental involvement. The level of significance (0.05) stated for testing the null hypothesis was greater than the associated P-value (0.043). Hence, the null hypothesis four which states that parental involvement is a significant predictor of students' interest scores in Biology is thereby rejected. The inference drawn is that parental involvement is a significant predictor of secondary school students' interest in Biology.

Research Question two: to what extent does self-efficacy predicts students' interest scores in Biology?

Table 3 Pearson Correlation Coefficient showing the Amount of Variance in Students' Interest in Biology that is Accounted for by Students' Self-Efficacy

Model	r	r^2	Adjusted R Square	Std. Error of the Est.
1	0.050[a]	0.003	0.000	6.05289

a. Predictors: (Constant), SE

SE=Self-efficacy

Table 3 shows that the Pearson correlation coefficient was weak and positive for the relationship between students' self-efficacy and students' interest in Biology *(r=0.050)*. The positive linear relationship between the two variables indicates that the higher the students' self-efficacy increased, the higher the students' interest in Biology. However, the $r^2$was 0.003, indicating that the percentage variance in students' academic interest that was explained by the variance in students' self-efficacy

was negligible. To ascertain whether this amount of variance in students' interest that was accounted for by students' self-efficacy was significant, analysis of variance for the model was examined.

Hypothesis two (Ho_2): Self-efficacy is not a significant predictor of students' interest rating scores in Biology.

Table 4: A test for the Significant in the Amount of Variance in Students' Interest in Biology that is accounted for by Students' Self-efficacy

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	44.255	1	44.255	1.208	0.272[b]
	Residual	17329.522	473	36.637		
	Total	17373.777	474			

a. Dependent Variable: BII
b. Predictors: (Constant), SE

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	48.248	2.109		22.877	0.000
	SEQ	0.053	0.048	0.050	1.099	0.272

a. Dependent Variable: SE
SE=Self-efficacy

Table 4 shows the simple linear regression conducted to predict students' academic interest in biology based on students' parental involvement. The regression equation was not significant *(F(1,473)= 1.208, P=0.272>0.05)* with an r^2 of 0.003. The students' predicted achievement score was equal to *48.248+0.053(SE)*. Students' average achievement in Biology score increased by 0.053 for each unit increase in students' self-efficacy. The level of significance (0.05) stated for testing the null hypothesis was lesser than the associated P-value (0.272). Hence, the null hypothesis four which states that**):** Self-efficacy is not a significant predictor of students' interest rating scores in Biology is therefore not rejected. The inference drawn is that self-efficacy was not a significant factor in secondary school students' interest in Biology. The result of the study is presented in this section in line with the research questions and the hypotheses that guided the study.

Research Question Three: To what extent will parental involvement and self-efficacy predict students' interest in Biology?

Table 5: Multiple Pearson Product Moment Correlation (R) and the Coefficient of Determination (r-square) for the regression of Interest on Parental Involvement and Self-efficacy

Model	R	R Square	Adjusted R Square	Remarks
1	0.10[a]	0.01	0.01	Very Small Effect
a. Predictors: (Constant), SE=Self-efficacy, PI=Parental Involvement				

Table 5 shows the multiple Pearson product moment correlation and the coefficient of determination for predicting secondary school students' interest in biology using their perceived parental involvement and self-efficacy. The results show that the relationship between perceived parental involvement, self-efficacy and interest in biology was 0.10 which implies weak and positive relationship. More so, the r-square of 0.01 implies that the variance in students' interest in biology was explained by the joint contribution of parental involvement and self-efficacy was negligible. Hence, parental involvement and self-efficacy taking together seem not to be a factor in students' interest in biology.

Table 6: Analysis of Variance (ANOVA) Showing that Parental Involvement and Self-efficacy had no joint Significant effect on Students' Interest

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	300.98	2	150.49	4.34	0.01[b]
	Residual	29341.96	847	34.64		
	Total	29642.94	849			
a. Dependent Variable: BI=Biology Interest						
b. Predictors: (Constant), SE=Self-efficacy, PI=Parental Involvement						

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	44.34	2.21		20.03	0.00
	PI	0.06	0.02	0.09	2.57	0.01
	SE	0.05	0.04	0.05	1.42	0.16
a. Dependent Variable: BI=Biology Interest						

Table 6 shows the ANOVA for test of significant of the predict power of parental involvement and self-efficacy on students' interest in biology. The results indicate that parental involvement had positive significant effect on students' interest in biology (*r=0.10, r-square=0.01, F(849,1)=4.34, p=0.01<0.05*). Self-efficacy, although was not a significant predictor of students' interest in biology (Beta=0.05, t=1.42, p=0.16>0.05), parental involvement was significant predictor of students' interest in Biology (Beta=0.09, t=2.57, p=0.01<0.05). The regression equation for predicting biology students' interest using students' parental involvement and self-efficacy, BI=0.06*(PI)+0.05*(SE)+44.34 was significant. Hence, it implies that the joint contribution of parental involvement and self-efficacy in predicting students' students' interest in Biology was significant.

Discussion

Discussion of parental involvement

The result of data analysis presented on Table 2 revealed that parental involvement significantly predict secondary school students' interest scores in biology. The findings of this study is in agreement with the finding of Al-Alwan (2014) which revealed that when parents show interest in their children, contribute to community building within the school or speak frequently with their children about school-related topics, they directly influence student's level of school engagement and contribute to students sense of identification with the school. The result is also in line with the finding of Lawson, (2021) which revealed that students with high level of interest in Biology performed better than those with low or without interest in the subject. Therefore, student only do well in what they are interested in, parent should encourage and inculcate the spirit of working hard in them in order to be capable and able to face difficult moment of their study no matter how stressful it is and to make right decision in their academic. It is obvious from the result that parents are concerned about their children success in and out of school.

The result of data analysis presented on the Table 4 showed that self-efficacy is not a significant predictor of students' interest in biology. This could be attributed tolack of student belief and confidence; student failure may likely affect their ability to move on with their academics. Student negative self-efficacy demoralized their interest and poses challenge on their academic tasks. Students' academic self-efficacy is mainly built upon past experiences. Success of the student's boosts their interest and motivates them while failure suppresses their interest in academic endeavour. Solmaz (2018) emphasized that student self-efficacy development has been allied with planned effort and perseverance in managing and handling challenging task in learning and teaching situations. The findings of the study deviate from the findings of Okafor and Okoli (2020) which revealed that interest in biology was significantly predicted by emotional intelligence, and academic self-efficacy. Therefore, student only do well in what they are interested in, parent should encourage them to have the ability to face difficult moment of their study no matter how stressful it is and to make right decision in their academics.

The result presented on the table 6 indicated that secondary school students' parental involvement and self-efficacy are significant predictors of their interest scores in biology. The finding of the study, presented on table 6 indicated that parental involvement and self-efficacy are predictors of student interest of secondary school students' biology in Nsukka education zone. Parenting/family is a fundamental factor, which contributes to a child's development. For a child, the family is the first social and educational environment. Therefore, a right beginning is the one that makes the most important part of a child's education. Therefore, when parents are involved in the education of their children various study habits and self-efficacy will be strong and enhance their students' interest in biology. Based on the findings, parental involvement remains an important multidimensional factor predicting students' interest in biology. Educators should make efforts to understand reasons why they should encourage parental involvement in senior secondary school because individuals put their interest in what he/she likes.

Students need a sense of efficacy when using their skills and knowledge. Self-efficacy is one's ability to face a task and come out successful. Self-efficacy influences students' interest in many ways, through vicarious experience, mastering experience, verbal persuasion, and physiological factors. Parents should motivate and encourage students' self-efficacy in order to believe in themselves that they have the capacity to succeed. Strong and positive self-efficacy in biology students have been found to put more interest or have aspirations in the subject in senior secondary school.

Interest is known to be an important internal factor that influences learning. Interest can be understood as individual or situational interests, so that individual interest is internal and stable, and it develops gradually, while situational interest is external, appearing as a response to something interesting in a person's environment. Uitto (2014) study showed that biology is a popular subject among senior secondary school students. Almost half the students agreed that biology topics are interesting; however, the interest in different topics is varying. Personal factors interact with school-related factors, such as the personality and attitudes of the science teacher, teaching methods, learning environments, and science career guidance. In these studies, other socio-cultural factors, such as home background, support from the parents and peers, and occupational role models, are also mentioned to influence students' secondary school education.

An internally motivated student likes to put more effort into studying the subjects they like. Students also have the patience to study the less interesting topics of a subject; for example, revising for exams, if they have the desire to get good grades. In this case, the motivation to study may be external, linked to rewards or achievement; for example, the motivation students get from their parents and teachers reinforces and enhances their interest in biology."

Conclusion

Based on the findings of this study, it is concluded that parental involvement and self-efficacy are important predictors of students' interest. Parental involvement and self-efficacy have statistical significant predictors on students interest in biology. Students with high level academic self- efficacy have more self-confident and have more positive attitudes towards their study.

Recommendation

From the findings, it was recommended that, Parents should endeavour to encourage, interact and motivate students to believe in themselves, and create conducive environment at home. The interaction between the school management and parents need to be more often, in the sense that teachers should contact parents all the time not just when problems arise. Teachers should also help students to build good and strong self-efficacy regularly through close monitoring.

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