



Impact of Parental Support on Biology Students' Academic Achievement and Attitude: Exploring School Location as a Moderator

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Abstract

Regardless of parents' economic status in the society, parents would want the success of their children in school and also love to see them highly placed in the society in future. Many times, daily engagements of parents divert their attention from the required academic support needed by the child. This could hinder the actualization of their good intentions, academic achievement and attitude of that child. Thus, the need for this study; impact of parental support on biology students' academic achievement and attitude using school location as a moderating variable. Ex-post facto research design was employed for the study. 7357 senior secondary school two (SSS2) biology students in Onitsha education zone of Anambra state formed the population of the study. The sample size was 379 SSS2 biology students drawn from the population. Parental Support Questionnaire (PSQ), Biology Achievement Test (BAT) and Students' Attitude Rating Scale in Biology (SARSB) were all researchers' developed instrument for data collection. All the instruments were face validated by experts from department of science education, faculty of education, university of Nigeria, Nsukka. 0.82 reliability index was obtained for BAT using Kuder-Richardson 20 formula (KR-20). PSQ and SARSB gave a reliability coefficient of 0.79 and 0.85 respectively using Cronbach Alpha method. All the research questions were answered using mean and standard deviation while all the hypotheses were tested at 0.05 level of significance using analysis of variance (ANOVA). It was revealed in the finding that the impact of parental support on students' achievement in biology is significant; there is no significant impact of parental support on students' attitude in biology; school location is a significant factor on the impact of parental support on students' achievement in biology; school location is not a significant factor on the impact of parental support on students' attitude in biology.

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Based on the findings; it was recommended among others that sensitization of parents on the need for their support on improving their academic achievement and attitude should be carried out by the school management.

Keywords: parental support; biology students' achievement; attitude; school location.

1. Introduction

To man, life is full of ups and down as a result of its challenges encountered within his immediate environment. This made man dabble into the study of the unknown with the use of different forms or systematic approach in order to provide the answer to an unanswered question [29]. This approach is known as science. It implies that science is a systematized enquiry approach in carrying out investigation about the unknown. Science has its way in different subjects studied in our secondary schools which includes; biology, chemistry, mathematics, physics, agricultural science and many more. Biology is one of the major science subjects offered in our secondary school since its study gives deep understanding about nature. This affirms the view of [7] who asserted that in most school biology is done by majority of students in science class but optional in for non-science students. Despite the deep understanding about nature offered by biology to secondary school students, its external examination such as West African Senior Secondary School Certificate Examination (WASSCE) has continuously witnessed yearly decrease in students' achievement specifically from 2015-2019 [1,12,13]. This has been an issue of concern to all and sundry. [23] in Vanguard newspaper report noted that parents contribute to students' poor achievement in WASSCE because most of them do not offer apt parental support for better academic development of their wards. The above-mentioned issues triggered the researcher's interest into investigating the impact of parental support on students' achievement and attitude particularly in biology. In academic setting, parental support is very important. This is because on the course of academic learning most students go through stress, anxiety, depression, mental and emotional illness [10]. Parental support could be seen as the involvement of parents towards academic dealings of a student so as to achieve their desire or ambition for that student. Also, parental support is defined as the tactic or intervention implemented by every family in tutoring and training the child to comprehend his or her full potential in life [2]. It is of no doubt that the thought of every parents for every of their children is to become better and more civilized person in future. This prompts most parents in providing safe and healthy environment for that child from birth and through schooling so as to compete with the dynamic nature of the world today [5]. Parental support also involves great commitment of time and capital towards academic development of the child. [32] grouped parental support into home and school support. Based on the grouping, the home support group includes; discussing school activities, parenting style, reading at home, checking homework, aspirations and expectations, home rules and supervision. While that of school support group are volunteering at school, attending parents' teachers' association (PTA) meetings and contacting school personnel. This implies that parental support can be fully achieved when parents engage in the emotional, psychological and mental development of their children both at home and in school. In this study, parental support is categorized into three (3); high parental support (i.e. great commitment of parents in the educational process and experience of their child), moderate parental support (i.e. reasonable extent of parental participation towards child academic development) and low parental support (i.e. no participation or involvement of parents in the child's academic advancement). Encouragement given by the parents to their children might strongly determines their academic success. This is because, the classroom teacher discovers

area(s) where the student is having challenge(s) and advice the parent to guide such student at home to ensure in-depth learning. This means that the teacher plays an advisory role. However, [37] opined that “in 2016, research showed a drop in parents who believed that intimate parent-teacher communication is effective; stating that parents now prefer online student portal and they are less likely to attend parent-teacher conference and school activities.” In Nigeria, there is decline in parental support because of low level of meaningful contact between the parents and school management which finally contributes to poor academic achievement and attitude of the students [11]. According to [33], the high expectancy level of parents on their ward especially in biology subject requires parental support to make that more achievable. It was further stated that biology as a subject requires parental support both at home and in school since the subject digs deep into better understanding of our environment. Thus, parental support could promote students’ achievement, interest, self-efficacy, self-concept and attitude in biology. Attitude is one of psychological construct that should not be played with while seeking for ways to improve students’ achievement [24]. The reason is because, attitude tends to account for the observed regularities in the behaviour of individual person, the quality of which is judged from the observed evaluative responses one tends to make. Attitude is the belief that one has towards people or surroundings. Such belief makes one to draw conclusion as to whether the people or surrounding is good or bad. In academic setting, attitude could be positive if the learning experience is favourable and vice versa [30]. This means that students are not born with attitude but they learn it based on experiences within their immediate environment. According to [7], attitude means a favourable or unfavourable tendency of individual towards an entity based on the evaluation of this entity by the individual. Attitude have received continuous investigation in the area of science educational research [25]. Previous research studies [16,18,36,19] reported that students’ attitude in science influences their academic achievement. Therefore, it is prudent to ascertain if parental support would improve students’ attitude and academic achievement specifically in biology. Hence, the need for this study. Another variable of interest in this study is school location. School location was included in this study as a moderating variable since the researcher wants to determine the impact of parental support on students’ achievement and attitude in biology based on their respective location. School location is define as the particular position of a place where education is obtain [21]. School location is the exact point, in connection to other territory in the physical environment (rural or urban), where the school is positioned [35]. In this paper, school location is the geographical spot where teaching and learning activities are been carried out. Thus, school location tends to group students based on their locality (that is; rural students and urban students). Rural students have been characterized with poor achievement due to inadequate laboratory among other factors [22,20]. On the contrary, Reference [28,14] report showed decline on urban students’ achievement due to lack of instructional coherence, students’ attitude and concentration level. This inconsistency in research findings prompted the researchers’ inclusion of school location in the study so as to find out the impact of parental support on both urban and rural students’ achievement and attitude especially in biology. On this background, the study was necessitated.

The following research questions guided the study;

1. What is the impact of parental support on students’ achievement in biology?
2. What is the impact of parental support on students’ attitude in biology?
3. What is the impact of parental support on students’ achievement in biology based on school location?

4. What is the impact of parental support on students' attitude in biology based on school location?

The following null hypotheses guided the study. All the hypotheses were tested at 0.05 level of significance.

1. The impact of parental support on students' achievement in biology is not statistically significant
2. The impact of parental support on students' attitude in biology is not statistically significant
3. The impact of parental support on students' achievement in biology is not statistically significant based on school location
4. The impact of parental support on students' attitude in biology is not statistically significant based on school location

2. Methods

The study adopted ex-post facto research design. 7357 senior secondary school two (SSS2) biology students (that is; 6050 urban students & 1307 rural students) in Onitsha education zone of Anambra state formed the population of the study. The sample size of the study comprised of 379 SSS2 biology students (that is; 274 urban students & 105 rural students). Taro Yamen formula was used in calculating the sample size. The instruments for data collection were structured questionnaires titled Parental Support Questionnaire (PSQ), Biology Achievement Test (BAT) and Students' Attitude Rating Scale in Biology (SARSB) all developed by the researcher. PSQ was arranged in two sections (A&B). Section A elicited information on the demographic data of the respondents. Section B has 10 items which was used to elicit information on parental support for students. PSQ was coded 3 for low parental support; 2 for moderate parental support and 3 for high parental support. BAT has 20 items (questions) with four options ranging from A-D where the students are expected to choose the correct answer that best suits the question. BAT was developed using table of specification to ensure content coverage. SARSB has 10 items which seeks information on students' attitude on biology. SARSB was coded 4 for Strongly Agree (SA); 3 for Agree (A); 2 for disagree (D), and 1 for strongly disagree (SD). All the instruments were face validated by experts from department of science education, faculty of education, university of Nigeria, Nsukka. Reliability coefficient of 0.82 was obtained for BAT using Kuder-Richardson 20 formula (KR-20). PSQ and SARSB gave a reliability coefficient of 0.79 and 0.85 respectively using Cronbach Alpha method. All the research questions were answered using mean and standard deviation while all the hypotheses were tested at 0.05 level of significance using analysis of variance (ANOVA).

3. Results

Research Question 1: What is the impact of parental support on students' achievement in biology?

Table 1 revealed that students who get high parental support had mean achievement score of 54.21 with a standard deviation of 16.394, those who moderately experience parental support had mean achievement score of 51.85 with a standard deviation of 14.179 while those who lowly get parental support had mean achievement score of 38.86 with a standard deviation of 13.649. This indicates that students who get high parental support had higher mean achievement score than those who moderately experience it and so on.

Table 1: Mean analysis of impact of parental support on students' achievement in biology

Parental Support	N	Mean	Std. Deviation
High	108	54.21	16.394
Moderate	157	51.85	14.179
Low	114	38.86	13.649

Hypothesis 1: The impact of parental support on students' achievement in biology is not statistically significant

Table 2: Analysis of variance of the impact of parental support on students' achievement in biology

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	15873.570	2	7936.785	36.763	.000
Within Groups	81174.187	376	215.889		
Total	97047.757	378			

The result in table 2 showed an f-ratio of ($F(2, 378) = 36.763, p < 0.05$). Since the associated probability value of 0.000 is less than 0.05 level of significance, the null hypothesis was rejected. Thus, inference drawn is that there is a significant impact of parental support on students' achievement in biology.

Table 3: Pairwise comparison test for the significant impact of parental support on students' achievement in biology

(I) Parental support	(J) Parental support	Mean Difference (I-J)	Std. Error	Sig.
High	Moderate	2.366	1.837	.596
	Low	15.353*	1.973	.000
Moderate	High	-2.366	1.837	.596
	Low	12.987*	1.808	.000
Low	High	-15.353*	1.973	.000
	Moderate	-12.987*	1.808	.000

Table 3 showed that the mean difference between the mean score of the students who gets high parental support and those who gets low parental support had the highest positive mean difference ($M_d = 15.353$) among other pairs. Thus, their mean difference contributed most to the significant impact of parental support on biology students' achievement.

Research Question Two: What is the impact of parental support on students' attitude in biology?

Figure 1 unveiled that students who gets high parental support had mean attitude ratings of 34.41 with a standard deviation of 1.316, those who moderately experience parental support had mean attitude ratings of 34.12 with a standard deviation of 1.718 while those who lowly gets parental support had mean attitude ratings

of 34.30 with a standard deviation of 1.362. This indicates that the students who gets high parental support had higher mean attitude ratings than those who moderately and lowly experience it.

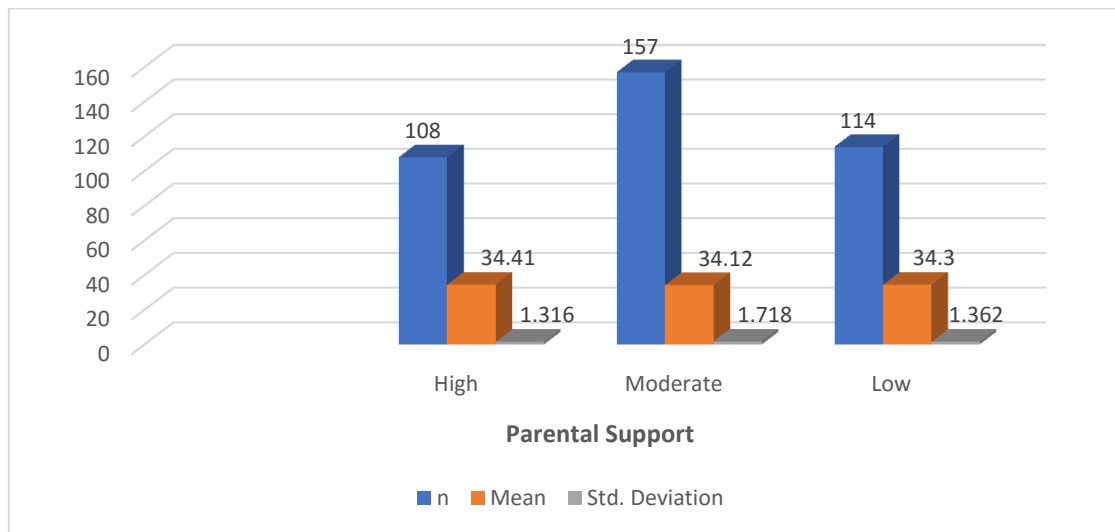


Figure 1: Mean analysis of impact of parental support on students' attitude in biology

Hypothesis 2: The impact of parental support on students' attitude in biology is not statistically significant

Table 4: Analysis of variance of the impact of parental support on students' attitude in biology

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	5.818	2	2.909	1.279	.279
Within Groups	854.842	376	2.274		
Total	860.660	378			

The result in table 4 showed an f-ratio of ($F(2, 378) = 1.279, p < 0.05$). Since the associated probability value of 0.279 is greater than 0.05 set as level of significance, the null hypothesis was not rejected. Thus, inference drawn is that, impact of parental support on students' attitude in biology is not significant.

Research Question 3: What is the impact of parental support on students' achievement in biology based on school location?

Table 5: Regression analysis of the moderating influence of school location on the impact of parental support on students' achievement in biology

Parental Support	School Location	N	Mean	Std. Deviation
High	Urban	88	57.67	14.874
	Rural	20	39.00	14.198
Moderate	Urban	130	54.54	12.751
	Rural	27	38.89	13.751
Low	Urban	56	39.02	13.699
	Rural	58	38.71	13.719

Result in Table 5 revealed that urban and rural students who experience high parental support had mean achievement score of 57.67 with a standard deviation of 14.874 and mean achievement score of 39.00 with a standard deviation of 14.198 respectively. Students in urban and rural location who gets moderate parental support had mean achievement score of 54.54 with a standard deviation of 12.751 and mean achievement score of 38.89 with a standard deviation of 13.751. On the other hand, mean achievement score of 39.02 with standard deviation of 13.699 and mean achievement score of 38.71 with standard deviation of 13.719 were had by urban and rural biology students respectively. This indicates that urban and rural students who experience high parental support had a higher mean achievement score. However, the urban students who gets high parental support had higher mean achievement score than their rural counterpart.

Hypothesis Three: The impact of parental support on students' achievement in biology is not statistically significant based on school location

Table 6: Two-way analysis of variance for the impact of parental support on students' achievement in biology based on school location

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	27032.340 ^a	5	5406.468	28.802	.000
Intercept	508025.775	1	508025.775	2706.456	.000
Parental support	4878.256	2	2439.128	12.994	.000
Location	8494.175	1	8494.175	45.252	.000
Parental support * location	4612.298	2	2306.149	12.286	.000
Error	70015.417	373	187.709		
Total	992775.000	379			
Corrected Total	97047.757	378			

a. R Squared = .279 (Adjusted R Squared = .269)

Result in table 6 showed an f-ratio of ($F(2, 378) = 12.286, p < 0.05$). Since the associated probability value of 0.000 is less than 0.05 set as level of significance, the null hypothesis was not accepted. Thus, inference drawn is that, school location is a significant factor on the impact of parental support on students' achievement in biology.

Research Question 4: What is the impact of parental support on students' attitude in biology based on school location?

Table 7: Regression analysis of the moderating influence of school location on the impact of parental support on students' attitude in biology

Parental Support	School Location	n	Mean	Std. Deviation
High	Urban	88	34.63	1.275
	Rural	20	34.45	1.317
Moderate	Urban	130	34.02	1.783
	Rural	27	34.26	1.377
Low	Urban	56	34.41	1.345
	Rural	58	34.41	1.298

Table 7 revealed that urban and rural students who experience high parental support had mean attitude rating of 34.63 with a standard deviation of 1.275 and mean attitude rating of 34.45 with a standard deviation of 1.317 respectively. Urban and rural students who gets moderate parental support had mean attitude ratings of 34.02 with a standard deviation of 1.783 and mean achievement score of 34.26 with a standard deviation of 1.377. On the other hand, mean achievement score of 34.41 with standard deviation of 1.345 and mean achievement score of 34.41 with standard deviation of 1.298 were had by urban and rural biology students respectively. This indicates that urban and rural students who experience high parental support had a higher mean attitude rating. However, the urban students who gets high parental support had higher mean attitude rating than their rural counterpart.

Hypothesis Four: The impact of parental support on students' attitude in biology is not statistically significant based on school location

Table 8: Two-way analysis of variance for the impact of parental support on students' attitude in biology based on school location

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	14.833 ^a	5	2.967	1.308	.260
Intercept	301084.389	1	301084.389	132774.807	.000
Parental support	.418	2	.209	.092	.912
School Location	4.601	1	4.601	2.029	.155
Parental support * School Location	4.764	2	2.382	1.051	.351
Error	845.827	373	2.268		
Total	445674.000	379			
Corrected Total	860.660	378			

a. R Squared = .017 (Adjusted R Squared = .004)

Result in table 8 showed an f-ratio of ($F(2, 378) = 1.051, p < 0.05$). Since the associated probability value of 0.351 is greater than 0.05 set as level of significance, the null hypothesis was accepted. Thus, inference drawn is that, school location is not a significant factor on the impact of parental support on students' attitude in biology.

4. Discussion

Finding revealed that students who gets high parental support had higher mean achievement score than those who moderately and lowly experience it. This means that moderate and low parental support did not improve students' achievement in biology. This could be as a result of extent of school activity discussion engaged by the parents with students, parenting style, aspirations and expectations, home rules and supervision. Also, the finding showed that there is a significant impact of parental support on students' achievement in biology. This could be as a result of unsuccessful academic pursuit encountered by some parents therefore viewing education as waste of time and resources. This finding is in-line with the finding of [15,4,5,17,38,35]. Reference [15] study on examining the relationship between parental involvement and secondary school students' academic achievement showed that parental involvement has a significant relationship on students' achievement. Parents contribution to their children's education has a consistent and positive effect on academic achievement [4]. Parental involvement is a significant factor for students' successful education [5]. Reference [17] revealed that parental support is correlated with school achievement of both children and adolescence. Reference [38] unveiled that parents' explicit and encouragement behaviours were perceived good by the students who passed in Pre-Calculus, but fair only by the respondents who failed in such subject. Reference [35] conducted an investigation on the effect of parental involvement on academic achievement in Chile. The study revealed that children whose parents have low involvement have low academic achievement. The study revealed further that there is significant effect of parental involvement on children's academic achievement in Chile. Finding unveiled that students who gets high parental support had higher mean attitude ratings than those who moderately and lowly experience it. This means that students' achievement did not improve with moderate and low parental support. The study also revealed that impact of parental support on students' attitude in biology is not significant. This implies that both high, moderate and low parental support do not have a significant impact on students' attitude in biology. This finding is in consonance with that of [24] who discovered that respondents with high parental involvement had the highest mean attitude. The study further stated that there is significant influence of parental involvement on students' attitude in science. Reference [34] observation is also in-line with the finding of this study. The study showed that there is no significant relationship between authoritarian attitude of mothers and problem-solving skills of high school students. This finding contradicts with the findings of [27] whose study revealed that there is a significant relationship between parental involvement and children's attitude. Reference [26] divulged that parents' attitude towards science have a positive and statistically significant effect on students' science achievement. This finding is not in agreement with the finding of this study. The finding revealed that urban and rural students who experience high parental support had a higher mean achievement score. Buttrressing this, it was unveiled that urban students who gets high parental support had higher mean achievement score than their rural counterpart. Also, the study showed that school location is a significant factor on the impact of parental support on students' achievement in biology. This means that urban and rural students have a significant impact parental support of their achievement in biology. This could be as a result of how parents from urban and rural location engages their wards (i.e. students) on school activity

discussion, home work and other academic activities. This finding is in affirmation with the finding of [8] who revealed that school location is a significant factor on parental involvement towards students' success. The finding this study is also in-line with that of [3] who unveiled high parental involvement is urban school than their rural counterparts. On the contrary, the finding of [6] contradicts with that of the present study. The study revealed that school location has no statistically significant impact of parental engagement in learning. The finding showed that urban and rural students who experience high parental support had a higher mean attitude rating. It was further discovered in the study that school location is not a significant factor on the impact of parental support on students' attitude in biology. This implies that the impact of parental support on students' attitude in biology based on school location is not significant. The finding here could be as a result of parental support style shown to students in their different school location. The finding of the study is in agreement with that of [31] who revealed that school location is not a significant factor on parent attitude towards schooling and education of children.

5. Conclusion

Based on the findings of the study and the discussion that follows; the following conclusion were made. Thus, the impact of parental support on students' achievement in biology is significant; there is no significant impact of parental support on students' attitude in biology; school location is a significant factor on the impact of parental support on students' achievement in biology; school location is not a significant factor on the impact of parental support on students' attitude in biology.

6. Recommendations

1. Sensitization of parents on the need for their support on improving their academic achievement and attitude should carried out by the school management.
2. School management should share their goals or expectation with the parents, and ask them to so the same so as to improve on the students' academic achievement and attitude.
3. Exchange of contact information should be done between the parents and teacher. This would help improve parental support in school as the teacher will fill comfortable reaching the parent on any issue.
4. This study should also be carried out in other subject area using different area of study

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