Students' Collaborative Learning Style, Self-Assessment, and Perceived Teachers' Affection as Predictors of Secondary School students' Academic Achievement in Anambra State.

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ABSTRACT

Students' collaborative learning style, self-assessment and perceived teachers' affection are strong facilitators of proactive learning. The study examined students' collaborative learning style, self-assessment and perceived teachers' affection as predictors of academic achievement in English language in Anambra State. Four research questions and three null hypotheses guided the study. The study adopted a predictive correlational design to provide answers to the research questions and hypotheses. The population of the study comprised 21204 SS II students from which a sample of 750 was drawn. Multi-stage procedure was used to select the sample. Three standardized research instruments namely; Core Self-Evaluation Scale (CSES) for self-assessment, Learning Style Inventory (LSI) for collaborative learning style, and Teacher Affective Support Scale (TASS) for perceived teachers' support, and scores from students' promotional examination in English language were used for data collection. Cronbach's alpha was used to determine the reliability of the items in the instruments. A reliability index of 0.72, for collaborative learning style, 0.67, for self-assessment, and 0.76, for perceived teachers' affection were obtained. The standard multiple regression was used to analyze the collected data. The research question 1 was answered using multiple regression. The research question 2 was answered using unstandardized β. The research question 3 was answered using adjusted R^2. The research question 4 was answered using standardized β. The null hypothesis 1 was tested using F-test for regression model. The null hypothesis 2 was tested using t-test for adjusted R^2. The null hypothesis 3 was tested using t-test for β at .05 level of significance. Findings showed that students' collaborative learning style, self-assessment and perceived teachers' affection scores yielded an adjusted R square of .007. This implies that predictors accounted for about 0.7% of the variance scores in academic achievement. It was indicated that among the independent variables, self-assessment significantly predicts academic achievement in English language, while collaborative learning style and perceived teachers' affection does not significantly predict academic achievement in English language. Finally, it was recommended that students should encouraged themeselves to utilize collaborative learning style, self-assessment and persieved

teachers' affection constructs in their learning process since the variables statistically and significatly predict academic achievement scores in English language.

Keywords: *Collaborative Learning Style, Self-Assessment, Perceived Teachers' Affection, and Academic Achievement.*

Introduction

Collaborative learning style, self-assessment, and perceived teachers' affection are crucial non-cognitive constructs that could enhance students' academic achievement at the secondary school level in Nigeria. For example, Ikpesu (2021) defined collaborative learning style as the process of constructing knowledge through the combination of grasping and transforming experiences. This unveils students' need for relatedness which describes the ability to connect oneself to others so as to actualize belongingness in the process of learning. It means that collaborative learning style serves as a link to multiple motivational indicators and adjustment to achieve in the academic domain. Absolutely, the present study examined the link that connects students' collaborative learning style, perceived teachers' affection, and self-assessment as the classroom learning experiences that could be utilized to predict academic achievement.

Self-assessment is a learning strategy that evaluates students' perceived competence in the learning task and could influence the cognitive ability to engage and achieve academically (Brown & Harris, 2013). Self-assessment unveils the need for students' autonomy in evaluating their level of achievement in the learning situation. It is the individualistic engagement strategy that could influence extrinsic self-beliefs such as collaborative learning style to engage and achieve academically. Then understanding the extent to which students' self-assessment could link with their perceived teachers' affection or empathy in the classroom teaching to predict academic achievement is another objective to be examined by the present study.

Moore and Kearsley (2004) defined perceived teachers' affection as the students' ability to assess and evaluate teachers caring behaviour and their aptitude (i.e.; keen desire and dedication to teach) in the classroom teaching and learning. The study of Moore and Kearsley is keen to explain the need for students' competence to understand the nature of teachers' empathy in the process of teaching. This could likely influence students' desire to show affection or empathy in their interactions with the social and physical classroom environment in an attempt to achieve academically. These processes guided the understand of how students cumulatively construct their self-beliefs in the learning situation as a conviction that shapes their reality to engage in achievement situation. The present study examined how the students' collaborative learning style, self-assessment, and perceived teachers' affection could jointly predict their academic achievement.

Academic achievement has been defined as scores obtained from examination that measure the extent to which a person has acquired certain information or mastered certain skills,

usually as a result of specific instruction (Mehrens and Lehmann, 2016). These scores characterized the cognitive reports obtained from achievement test assigned to assess a person's performance in a course of study which he/she has undergone. In an effort towards scientific and technological advancement, the importance of mathematics cannot be overemphasized. Nigeria needs nothing short of good achievement in mathematics at all levels of schooling. Unfortunately, the achievement of students in mathematics at the end of secondary education has not improved (Yaloye, 2013). Inappropriate usage of these variables could have contributed to this learning problem, such as poor academic achievement in English language among the secondary school students in Anambra State.

The constant decline in the students' academic achievement in English language in external examination like Senior School Certificate Examination (SSCE) conducted by West African Examination Council (WAEC) over the years, raised concerned on the attainment of goals of secondary school education in Nigerian (National Bureau of Statistics, 2022). According to the study of Ugwu (2022), the qualitative reports from the WAEC Chief Examiner from 2019 to 2022 revealed little rise in students' achievement in English language but that does not mean that errors and weaknesses does not exist in students' use of English language. The weaknesses include; poor literary appreciation, misinterpretation of questions, lack of critical skills and originality in responding to questions, poor communication skills, and an inability to answer questions in good English. In the NECO SSCE, the Chief Examiners' report indicates that from the statistics of students that sat for English language from 2019 to 2022, less than 1% of them got A1 (75%); most of those who passed scored C6, (50%-54%) which is just an average score in Anambra State. Although the SSCE may not be the only yardstick for measuring students' academic achievement level in English language, it helps to understand what is happening in the school system and whether students are learning or not. The questions as to whom or what organization is to be blamed over this poor achievement in English language is an issue that has been left unanswered.

The abysmal academic achievement in English language has made researchers and educators to begin to think on how collaborative learning style, self-assessment, and perceived teachers' affection could provide insight to improve the poor academic achievement in English language. The problem is could the students' inability to utilize these cognitive variables in the learning of English language cause the abysmal achievement in this subject? Many studies have justified the relationships that exist among students' academic achievement in English language, collaborative learning style, self-assessment, and perceived teachers' affection. Notwithstanding, no known study has examined the multiple regression and jointly prediction of self-assessment, collaborative learning style, and perceived teachers' affection on students' academic achievement in English language.

Relatively, Leon, Auqusto-Lanada and Garcia-Martinez (2021) revealed that the relationship between students with self-assessment skills was significant with their score in English language. The findings also recorded that self-assessment skills predicted students' English language at a higher level. The study of Debicki, Kellermanns, Barnett, Pearson, and Pearson (2016) recorded a positive relationship between core self-evaluation of the students and their academic achievement. The study of Chandra (2015) revealed a high degree of positive correlation between collaborative learning and English achievement of undergraduates' students.

Therefore, to elucidate how the collaborative learning style, self-assessment, and perceived teachers' affection could enrich the understanding of students' motivational propensity to engage, approach, and respond to learning situation and achieve academically is a fundamental reason for the present study. On this backdrop, the present study examined collaborative learning style, self-assessment and perceived teachers' affection as predictors of academic achievement in English language at the secondary school level in Anambra State.

Research Questions

The following research questions guided the study.
7. To what extent are the assumptions of multiple regression for predicting students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores were met?
8. What is the nature of the regression equation for predicting students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores?
9. Which of the independent variable such as collaborative learning style, self-assessment, and perceived teachers' affection scores better predicts students' academic achievement in English language scores?
10. What is the unique contributions of collaborative learning style, self-assessment, and perceived teachers' affection scores to students' academic achievement scores in English language?

Hypotheses

The following null hypotheses were tested at .05 level of significance.
7. The regression equation does not significantly predict students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affections scores.
8. Collaborative learning style, self-assessment, and perceived teachers' affection do not significantly predict students' academic achievement scores in English language.
9. The unique contributions of collaborative learning style, self-assessment, and perceived teachers' affection scores to students' academic achievement scores in English language is not significant.

Method

The researchers used a predictive correlational research design for the study. The population of the study consisted of 21204 being the total number of students in senior Anambra State. The sample of this study comprised 750 SS2 students from the three selected education zones in Anambra State. The sample size was derived through a multistage sampling method which involved many stages. The procedures for the selection were as follows: In stage one, three education zones were selected from the six education zones in the state by simple random sampling. In stage two, from each sampled education zone, one local government area (L.G.A) was selected through simple random sampling given a total of three (3) L.G.As. In stages three, from each sampled LGA, 10 schools were randomly selected, giving 30 schools. Then, from each schools, 25 SSII students were selected for the study using a simple random sampling table. This gave a total of 750 students used in the study.

The study adapted three standardized research questionnaires namely; Judge, Eres, Bono and Thoresen's Core Self-Evaluation Scale (CSES, 2003), Kolb Learning Style Inventory (LSI, 1999), and Hall and Walsh, Teacher Affective Support Scale (2002). The Teachers Affective Support Scale was collected from different scholars to make up the 12 items that were used for the study. The students' achievement scores in English language from the state wide senior secondary one (SS1) promotion examination were obtained and used for achievement scores.

The methods used for validating the instruments were face and construct validity by the three experts from the Faculty of Education, Nnamdi Azikiwe University Awka. Cronbach's alpha reliability method was used to determine the internal consistency of the items in the research questions such as; 0.72, for collaborative learning style, 0,67, for self-assessment, and 0.76, for perceived teachers' affection. Data were analyzed using standard multiple regression analyses. Research question 1 was answered using a multiple regression equation. Research question 2 was answered using unstandardized β. Research question 3 was answered using adjusted R^2. Research question 4 was answered using standardized β. Hypothesis 1 was tested using the F-test for the regression model. Hypothesis 2 was tested using the t-test for adjusted R^2. Hypothesis 3 was tested using the t-test for β, at .05 alpha level of significance.

Presentation of Results

The data were first screened for missing values, and 92 respondents had missing representing 12.26%. Hence likewise deletion approach was adopted. After deleting the 92 respondents, the sample size was reduced to 658. Thereafter, analysis of the study was carried out using standard multiple regression analysis with SPSS 26.

Research question 1: To what extent are the assumptions of the regression equation for predicting students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores met?

Table 1: Descriptive statistics of independent and dependent variables in the regression model for the study (N = 685).

Variables TF	CLS	SA	PTA	AA	X	SD	Var	Skew	Kurt	VIF
CLS 1.036	1				21.77	2.958	8.751	-.619	1.798	.965
SA 1.051	.137	1			21.95	2.983	8.900	-.573	1.710	.951
PTA 1.055	.149	.192	1		22.31	2.864	8.205	-.620	1.360	.948
AA .605	.071 ……..	.089 ………	.010	1	57.45	8.463	71.615	.140	-

Std. Residual Min = -2.893, Std. residual Max = 2.700, Durbin Waston statistics = 1.867, CLS = Collaborative Learning Style, SA = Self-Assessment, PTA = Perceived Teachers' Affection, AA = Academic Achievement, X = Mean, SD = Standard Deviation, Var = Variance, Skew = Skewness, Kurt = Kurtosis, VIF = Variance Inflated Factor and TF = Tolerance Factor
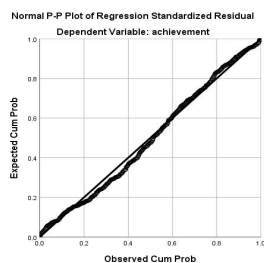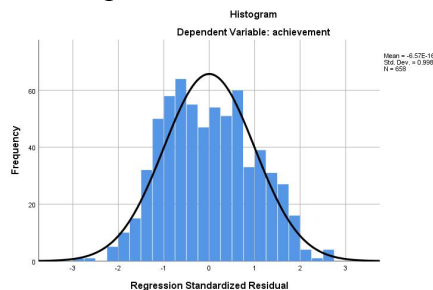
Fig 1 the normal P-P plot of standardized residuals data points of academic

achievement.
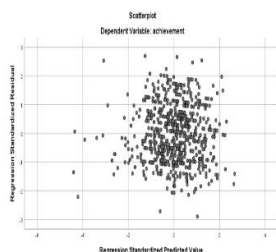Fig 2 the normal distribution curve of the standardize residuals data points of academic achievement.

Fig 3 scatter plot of standardized predicted values of academic achievement.
To answer research question 1, seven assumptions of multiple linear regression were tested in this study. First, the assumptions of normality of the data were tested using Skewness and Kurtosis. The assumptions were made since none of the Skewness and Kurtosis values of each of the variables does not exceed + 3 and − 3 as recommended. Second, the assumptions of absence of multivariate outliers was checked using standardized residual statistics and Cook distance statistics (1977). Result of standardized residual values were presented as follows: (Std, Residual Min = -2.893, Std, Residual Max = 2.700). It lies between -3 to 3 as recommended by Tabachnick and Fidell (2018). While the result of the Cook distance shows a maximum value of .053 which is less than 1 as recommended by Cook (1977). Hence, the assumptions of absence of multivariate outliers was not violated. Third, the assumptions of absence of multicollinearity among the predicting variables were checked using Variance Inflated Factor (VIF), and Tolerance Factor (TF). The Tolerance Factors and Variance Inflated Factors (Collaborative Learning Style, TF = .965, VIF = 1.036; Self-Assessment, TF = .951, VIF = 1.051; Perceived Teachers' Affection, TF = .948, VIF = 1.055; of the independent variables show that the values were less than 10 for Variance Inflated Factor and greater than .20 for Tolerance Factor respectively as recommended by Schumaker (2015). Hence, this assumption of absence of multicollinearity was made. Fourth, the assumption of independent of error was tested using Durbin Waston statistics. The result shown a Durbin Waston statistics of 1.867 which is less than

4 but greater than 0 as recommended by Denis (2020). Hence, the assumption of independent of error was not violated. Fifth, the assumptions of normality of error distribution were tested using normal P.P plot of standardized residual. Figure 2 shows that the normal P.P plot of standardized residual data points were normally distributed. Histogram of the standardized residual in figure 3 also testified to that. Sixth, the assumption of homogeneity of variance and linearity was tested using scatter plot of standardized predicted values. The result in figure 4 shows that the data met the assumption of homogeneity of variance and linearity as the predicted values were distributed above zero in both dimensions and do not show any pattern. Seventh, the assumptions of non-zero variance were tested using variance statistics and the data also met the assumptions of non-zero variances (Collaborative Learning Style, Variance = 8.751; Self-Assessment, Variance = 8.900; Perceived Teachers' Affection, Variance = 1.360; Academic Achievement, Variance = 71.615) as there is no zero variance for the variables in the study as shown in the table 1.

Research Question 2: What is the nature of the regression equation for predicting students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores?

Table 2: Regression coefficient for collaborative learning style, self-assessment, and perceived teachers' affection scores (N = 685).

Model	Unstandardized β	Std. Error	Standardized β
Constant	49.374	3.737	
Collaborative learning Style	.177	.113	.062
Self-assessment	.238	.113	.084
Perceived teachers' affection	-.045	.118	-.015

Using the information in Table 2, the nature of the regression equation for predicting students' academic achievement in English language using collaborative learning style, self-assessment and perceived teachers' affection scores follows:

$Y = b_0 + b_1x_1 + b_2 x_2 + b_3 x_3$

$Y = 49.374 + .177 x_1 + .238 x_2 + -.045 x_3$

$Ach = 49.374 + 0.177 + 0.476 - 0.135$

$Achievement = 49.374 – 0.177 CLS + 0.476 SA - 0.135PTA$

CLS = Collaborative Learning Style, SA = Self-Assessment, PTA = Perceived Teachers' Affection.

The equation shows that for every unit increase in collaborative learning style, achievement increased by 0.177. For every unit increase in self-assessment, achievement increased by 0.476. For every unit decrease in perceived teachers' affection, achievement decreased by – 0.135.

Research Question 3: Which of the independent variable such as collaborative learning style, self-assessment, and perceived teachers' affection scores better predicts students' academic achievement in English language scores?

Table 3: Regression model summary of collaborative learning style, self-assessment, and perceived teachers' affection scores on students' academic achievement scores in English language (N = 685)

Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
	.108ᵃ	.012	.007	8.432

To answer research question in Table 3 the adjusted multiple regression R square was used. The result of study shows that using collaborative learning style, self-assessment and perceived teachers' affection scores yielded an adjusted R squared of .007. This implies that predictors accounted for about 0.7% of the variance scores in achievement in English language.

Research Question 4: What is the unique contributions of collaborative learning style, self-assessment and perceived teachers' affection scores to students' academic achievement scores in English language?

Table 4: Regression coefficient for students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores (N = 685).

Model	Unstandardized β	Std. Error	Standardized β
Constant	49.374	3.737	
Collaborative learning Style	.177	.113	.062
Self-assessment	.238	.113	.084
Perceived teachers' affection	-.045	.118	-.015

To answer research question 4, the standardized regression coefficient (β) in Table 4 was used for comparison. The regression coefficients presented in table 4 shows unstandardized (β) and standardized regression coefficient (β) collaborative scores are .177 and .062. For self-assessment scores are .238 and .084. For perceived teachers' affection scores are - .045 and - .015 respectively. Using the standardized beta for comparison, self-assessment is mostly predicted students' academic achievement in English language as shown by the β of .084. Collaborative learning style   is the second most predicted students' academic achievement in

English language as shown by the β of .062. While perceived teachers' affection is the third most predicted students' academic achievement in English language as shown by the β of -.015.

Hypothesis 1: The regression model does not significantly predict academic achievement scores in English language.

Table 5: F- test for regression model of collaborative learning style, self-assessment, and perceived teachers' affection scores on students' academic achievement in English language scores (N = 685).

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	552.982	3	184.327	2.593	.052[b]
Residual	46498.057	654	71.098		
Total	47051.040	657			

The analysis of variance in the Table 5 shows that the regression equation was significant (3, 654) = 2.593, p < .05. This implies that at least one of the independent variables significantly predicted the academic achievement in English language.

Hypothesis 2: Collaborative learning style, self-assessment and perceived teachers' affection scores does not significantly predict students' academic achievement in English language.

Table 6: t-Test of regression coefficient of students' academic achievement scores in English language using collaborative learning style, self-assessment, and perceived teachers' affection scores (N = 685).

Model	Unstandardized β	Std. Error	Standardized β	T	p-value	remark
Constant	49.374	3.737		13.211	.000	S
Collaborative Learning style	.177	.113	.062	1.564	.118	NS
Self-assessment	.238	.113	.084	2.104	.036	S
Perceived teachers' affection	- .045	.118	- .015	- .379	.705	NS

Table 6 shows that self-assessment scores significantly predict students' academic achievement scores in English language since the p-value is less than .05. Then, collaborative learning style and perceived teachers' affection scores does not significantly predict academic achievement scores in English language since their p-values are greater than .05.

Hypothesis 3: The contributions of students' collaborative learning style, self-assessment and perceived teachers' affection scores in predicting students' academic achievement in English language scores is not significant.

Table 7. t-Test of adjusted R square of the regression model for this study (N = 685).

Model	R	R- Square	Adjusted R- Square	Std. Error Estimate	t – cal for adj. R^2	DF	t- crt.	Remark
	.108[a]	.012	.007	8.432	2.7828	656	1.960	S

To test hypothesis 3, t-test for adjustment R square was conducted. Results of the study shown in Table 6 indicates that t-critical for adjusted R square is 1.960 while that of the calculated is 2.7828. Since the t-calculated for adjusted R square 2.7828is greater than t-critical 1.960, the null hypothesis which states that the contribution of students' collaborative learning style, self-assessment and perceived teachers' affection scores in predicting students' academic achievement in English language scores is not statistically significant is rejected and the alternative hypothesis is accepted. In other words, the contribution of students' collaborative learning style, self-assessment and perceived teachers' affection scores in predicting students' academic achievement in English language scores is statistically significant. Effect sizes were also evaluated using adjusted R^2 comparing it with Cohen's *d* statistics guideline, where d < 0.20 indicates a minimal effects size, 0.20 < d < 0.50 indicates a small effect size, 0.50 < d < 0.80 indicates a moderate effect size, and d > 0.80 indicates a large effect size. The value of R adjusted square .007 indicates a minimal effect.

Discussion of findings

The findings of the result revealed that meeting the assumptions of the regression model implies that the data are suitable to the analysis. This also implies that the results obtained from the multiple regression analysis are more precise, accurate and reliable. Furthermore, meeting the assumptions of the model also implies that the decision taken based on the output of the regression model deem to be accurate and reliable in the study. Therefore, the equation line developed in the study based on the coefficient using unstandardized (β) deem to be stable, accurate and valid in predicting students' academic achievement in English language.

On the nature of regression equation, perceived teacher's affection has negative contribution to the predicting model, while self-assessment and collaborative learning style scores have positive contributions to the predicting model. This implies that both self-assessment and collaborative learning style have positive influence on students' achievement in English language while perceived teacher's affection has negative on students' achievement in English language. This was partly supported by the study of Leon, Auqusto-Lanada and Garcia-Martinez (2021) which revealed that students with self-assessment skills was significant with their score in English language. The findings also recorded that self-assessment skills predicted students' English language at a higher level. These results suggest that students with better study strategies will be more confident in assessing their own achievement. This also supported the study of Chandra (2015) which revealed a high degree of positive correlation between collaborative

learning and English achievement of undergraduates' students. This also supported the study of Debicki Kellermanns, Barnett, Pearson, and Pearson (2016) recorded a positive relationship between core self-evaluation of the students and their academic achievement.

In terms of prioritizing the predicting power of the independent variables in the model, self-assessment mostly predicted students' academic achievement in English language. This implies that when students utilize self-assessment in the process of learning English language, personal feedback that will determine the desire to engage in learning English language will be actualized. The collaborative learning style as the second most predicted students' academic achievement in English language. This indicates that students' can collaboratively solve their academic problem through the interactive learning approach. Finally, perceived teachers' affection takes the least in predicting academic achievement in English language. This indicates that the perception students had for their teachers' attitude and behavior in the teaching process has negatively been influencing the student's willingness to engage meaningfully in learning English language.

Conclusion

The present study concluded that collaborative learning style, self-assessment, and percieved teachers' affection have critical roles to play on students' academic achievement since these variables have relatively and jointly predicted students' achievement scores in English language.

Reccomendations

Based on the findings, the following recommendations were made:

iv.   Students should encourage themeselves to utilize collaborative learning style, self-assessment, and persieved teachers' affection constructs in their learning process since the variables statistically and significaty predict academic achievement scores in English language.

v.   Considering the positive relationship that existed among the students' percieved teachers' affection, collaborative learning style, self-assessment, and achievement scores in English language, teachers should constantly demonstrate positive affection/empathy to the students in the teaching and learning process so that students' will concentrate in the learning of English language.

vi.   Finally, future researchers should adopt another analytical approach like hierachical regression to reexamine these variables in the subsiquent study to see if there will be changes among the variables in predicting academic achievement.

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