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LEARNING STYLE AS PREDICTOR OF ACADEMIC ACHIEVEMENT OF SECONDARY SCHOOL STUDENTS IN ENGLISH LANGUAGE AND MATHEMATICS IN ANAMBRA STATE

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ABSTRACT

This paper aimed at examining learning style as predictor of academic achievement in English Language and Mathematics of secondary school students in Anambra State. Two research questions and two hypotheses guided the study. Correlational survey research design was adopted for this study. The population for this study comprises 18,787 Senior Secondary School two SS II students from 261 secondary schools situated in the six education zones in Anambra state. The sample for this study comprised of 825 SS II students. The instruments adopted for the study are: Bakare developed the Kolb Learning style developed in 1971 are standardized instruments. They have been previously adopted and validated by experts and used in conducting studies in Nigeria. The instruments have been subjected to internal consistency using Cronbach alpha statistics among other reliability statistics. The administration of the instrument was done through direct delivery approach. By this method, copies of the questionnaire were distributed personally to the respondents by the researcher with the help of 6 regular teachers who serve as research assistants. The research questions and hypotheses were tested using multiple regression analysis to determine the R, R-square and R^2 adjusted. The findings of the study revealed that secondary school students' learning styles do not significantly predict their academic achievement in either English Language or Mathematics in Anambra State. Secondary school students learning style contributed -4.80 percent of their academic achievement, indicating that there is no significant prediction of secondary school students' learning style on their academic achievement in English language in Anambra State. The findings also revealed secondary school students learning style contributed 1.10 percent of their academic achievement in Mathematics, indicating that there is no significant prediction of secondary school students' learning style on

their academic achievement in Mathematics in Anambra State. conclusion was made and it was recommended that teachers should incorporate a variety of instructional strategies that cater to different learning styles. Given the prevalence of reflective observation and abstract conceptualization learning styles, educators should use methods that encourage reflection, critical thinking, and abstract reasoning alongside practical and hands-on activities. Also, since learning styles have minimal impact on Mathematics achievement, schools should explore and address other factors affecting performance in this subject. This could involve providing specialized training for Math teachers, using interactive and technology-enhanced teaching tools, and addressing math anxiety through counseling and support programs.

Keywords: Learning style, academic achievement, secondary school, students, English language, mathematics.

Introduction

The pursuit of academic excellence among secondary school students has become a paramount concern in educational systems globally, and academic achievement is a multifaceted phenomenon influenced by a myriad of factors, including cognitive abilities, socio-economic status, school environment, and personal habits. Among these, study habits and learning styles stand out as critical determinants of academic success. In Nigeria, particularly in Anambra State, the contribution of students' study habits and learning styles to their academic achievement remains a critical area of inquiry in education and learning.

As reported by Olufemi (2021), in the 2019/2020 WAEC examination, only 39.82% made credit in five subjects (including english langauage and mathematics). The result indicates a decline in the achievment of students from examination records of the previous years, this state of affairs raises concern among some parents and caregivers. According to Akunne and Anyamene (2021), the West African Examination Council (WAEC, 2021) reported the May/June WAEC examinations stating that 786,016 candidates representing 49.98 per cent obtained credits and above in a minimum of five subjects including English Language and Mathematics. This further revealed fluctuation and decline in the performance of students when compared with that of 2016 which was 52.97 per cent, and in 2017 which was 59.22 per cent. This has prevailed in many states of the federation including Anambra state.

In secondary schools, every classroom plays host to different studnetswith different academic achievement recored in their terminal examination as well as in external examinations. These decline in the acheievement of students in core subjects like Mathematics and English language leads to loss of interest in learning and schooling among other behaviours students develop. However, many factors have been attributed to this usatisfactory state of fluctuating achievement in academics. These factors, include: students' negative attitude towards science subjects, students' lack of interest in science subject, gender inequality,

student study habits and learning styles (Agbaje and Alake 2014).

Learning style is defined by Brown in Gabal and Hussien (2021) as the manner by which individuals understand and process information in learning circumstances. Similarly, McLaughlin in Ikechukwu (2017)defined learning style as adopting a habitual and distinct mode of acquiring knowledge. Fleming in Ikechukwu (2017)who authored the VARK Model in like mannerdefined it as an individuals characteristics and preferred ways of gathering, organizing, and thinking about information.In other words, it is the consistent pattern of behaviour and performance by which an individual approaches educational experiences. It is the way an individual concentrate and his method in processing and obtaining information, knowledge,or experience.

Observations have shown that each students learn and process information in different ways. Nevertheless, extant researches have consistently established that an effective learning style adopted by studentsis one of the major strategy to ensure good academic achievement(Ghanney, Appiah and Esia-Donkoh, 2019). In the same vein, Ghanbari and Chermahini(2013) averred that learning style is generally used to explain an individual's natural or habitualpattern of acquiring and processing information in learning situations. Learning style is a distinctive and habitsual manner through which knowledge, skillsor attitudes are acquired based on study or experience. According to Liang (2012), when studentsare aware of their best learning style it helps to heighten acquisition of knowledge within a specifictime frame. This suggests that learning style is directly linked to student learning outcomes and also, individual learning styles in most cases dependon cognitive, emotional and environmental factors, as well as one's prior experience. Many students fail to realize thisbecause they may have attended schools where teachers delivered instruction in one way and never encouraged studentsto learn and understand their unique styles(Ghanney, Appiah and Esia-Donkoh, 2019). They further stated that learning style is derived from cultural socialization and individual personalityas well as form the broader influence of human development.

As observed among secondary school students in Anambra state, most students fail to assimilate the concepts being taught in the classroom and also carry out task relating to what they have been taught. This has continued unabated, despite being a process for students to succeed in their studies, they must be able to appropriately assimilate course content, digest it, reflect on it and be able to articulate the information in written and oral form. Observation by the researcher have shown that secondary school students fall short of the aforementioned. However, this could be given a facelift if students develop goodtime management skills, create study groups with peers among others activities that support academic achievement. Marc (2011) explained that students with learning problems may still have generally inefficient and ineffective study habits and skills. However, the issue of learning styles remains source of concern to many stakeholders in the education sector,

due to the constant decline in the academic achievement in English language and mathematics among secondary school students.

Purpose of the Study

The main purpose of this study is to examine learning style as predictor of academic achievement of secondary school students in English language and Mathematics in Anambra State. Specifically, this study examined:

1. The predictive value of secondary school students learning styles on their academic achievement in English Language in Anambra State.
2. The predictive value of secondary school students learning styles on their academic achievement in Mathematics in Anambra State.

Research Questions

The following research questions guided the study.

1. What is the predictive value of secondary school students learning styles on their academic achievement in English Language in Anambra State?
2. What is the predictive value of secondary school students learning styles on their academic achievement in Mathematics in Anambra State?

Hypotheses

The following null hypotheses was tested at 0.05 level of significance

1. There is no significant prediction of secondary school students' learning style on their academic achievement in English Language in Anambra State.
2. There is no significant prediction of secondary school students' learning style on their academic achievement in Mathematics in Anambra State.

Review of Related Literature

Theoretical Studies

This study is hinged on the social constructivism theory was propounded by Vygotsky (1968). Social constructivism is a cognitive theory of development and learning based on the ideas of Vygotsky. The constructivism approach supports the belief that children actively seek knowledge. It explains children's cognitive development provides guidance on how and what to teach and provides direction on how to arrange learning environments. Constructivism is defined in terms of the individual's organizing, structuring, and restructuring of experience – an ongoing lifelong process – in accordance with existing schemes of thought. In turn, these very schemes become modified and enriched in the course of interaction with the physical and social world.

The essence of constructivist theory is the idea that learners must individually discover and transform complex information if they are to make it their own. Constructivist theory sees learners as constantly checking new information against old rules and then revising rules when they no longer work. This view has profound implications for teaching because it suggests a far more active role for learners in their

own learning than is typical in many classrooms. Because of emphasis on students as active learners, constructivist strategies are often called student-centered. In relation with the present study, the teacher becomes the "guide on the side" instead of the 'sage on the stage', helping learners to discover their own meaning instead of lecturing and controlling all classroom activities. No doubt, this theory provides the basic foundation on which the teaching and learning process is anchored. In order to incorporate the issues of academic achievement in the study, this theory was reviewed, as the present study will focus on examining learning styles as predictors of academic achievement of secondary school students in Anambra State

Empirical Studies

This study reviewed studies related to the present study, the following studies were reviewed thus;

Akanni (2020) investigated the impact of learning styles and self-efficacy in predicting secondary school students' academic performance within Education District III, Lagos State, Nigeria. The descriptive research design of survey type was used. Stratified random sampling methods were used to select one hundred and ninety-six (196) respondents from four secondary schools. Two research instruments titled "Learning styles and self-efficacy in predicting academic performance of senior secondary school students' and an English Language and Mathematics Achievement Test. Three research hypotheses were formulated and tested at 0.05 level of significance to guide the study. Findings from the study revealed that: there is no significant relationship between students' learning style and their academic performance; there is no significant difference in academic performance of students based on their levels of academic self-efficacy. Findings from the study also revealed that the most preferred style of learning is the auditory learning style, followed by visual learning style, and the least preferred is the kinesthetic learning style. Based on the findings, it was recommended amongst others that teachers should beef up their teaching methods so as to ignite the guest of their students in discovering the appropriate learning style that is useful for them in achieving educational success; Students should also take the individual challenge to identify the kind of learning style that suit their personality, which is a culture that can help to imbue their self-efficacy.

Both the reviewed study and the current study sought to explore the relationship between learning styles and academic performance among secondary school students in Nigeria, utilizing a correlational research design. Akanni (2020) examined the impact of learning styles and self-efficacy on students' academic performance in Lagos State, using a descriptive survey design. Stratified random sampling selected 196 respondents from four schools, and data was collected using two research instruments. The study tested three hypotheses at a 0.05 significance level.

The current study in Anambra State also used a correlational survey design, focusing on learning styles among 825 SS II students from 261 schools. Standardized

instruments were administered directly with teacher assistance, and multiple regression analysis was used to answer research questions and test hypotheses. Thus, the primary differences lie in the sample sizes, geographic locations, and additional focus on self-efficacy in Akanni's study, compared to study habits in the Anambra study. Both studies employed hypothesis testing at a 0.05 significance level but differed in their specific analytical methods and instrumentation.

Igwe and Iweka (2019) investigated learning styles as predictors of students Mathematics achievement in Secondary Schools in Rivers State. Correlational research design was used. A sample of 800 students were drawn from the population of 35, 201 Junior Secondary School 3 (JSS 3) students in Rivers State, Government schools. Multiple choice questions on Mathematics of 2017 Rivers State Basic Certificate Examination were adapted/used to determine students' academic achievement in Mathematics. VARK questionnaire adapted from Utica College (2006) was used to get scores for their learning styles. SPSS was used to carry out the analyses, Research Question 1-4 were answered using simple regression, their corresponding hypotheses tested using ANOVA associated with regression analysis. Research Question 5 was answered using multiple regression analysis, the corresponding hypothesis tested using ANOVA associated with multiple regression. Results of the study tested at 0.05 level of significance showed: Read/Write learning style, joint learning styles and study habits do significantly predict students' academic achievement in mathematics. It is therefore recommended that students should adopt Read/Write learning styles, else the learning styles (VARK) should jointly be adopted. Educators should use the preferred students learning style for effective teaching/learning.

Both studies employed a correlational research design to investigate learning styles as predictors of academic achievement in secondary schools. Igwe and Iweka (2019) focused on Mathematics achievement among 800 Junior Secondary School 3 students in Rivers State, using adapted multiple-choice questions from the 2017 Rivers State Basic Certificate Examination and the VARK questionnaire to assess learning styles. Simple and multiple regression analyses were used, with corresponding hypotheses tested using ANOVA.

Similarly, the current study in Anambra State examined study habits and learning styles as predictors of academic achievement among 825 SS II students. It utilized standardized instrument, the Learning Style Inventory, with data collected by teachers and analyzed using multiple regression. The key similarities include the use of correlational design and regression analysis, while differences lie in geographic locations, sample sizes, academic focus (Mathematics vs. overall academic achievement), and the specific instruments used for data collection.

Bangcola (2016) determined learning styles as predictor of academic performance in the nursing department of an Asian university and colleges. The study adopted a quantitative descriptive-correlational research design. The participants consisted

of 304 nursing students who were randomly selected from eight nursing schools in Marawi City. The Perceptual Learning Style Questionnaire was utilized to carry out the rationale of the study. The results demonstrated that the students were generally doing fairly well in the nursing program and generally exhibited a close balance between all the learning styles. The four learning styles (Visual, Auditory, Tactile and Kinesthetic) were found to have been used by the students simultaneously as major learning styles with most of them expressing preference for Kinesthetic learning style (78%) while expressing minor and negligible preference for Group learning style. The study revealed important relation between learning styles and performance. The findings in this study highlight the importance of recognizing students' varying learning styles. Teachers should be aware that efficacy with more learning styles will allow students to achieve the optimal learning environment.

Both studies investigated the relationship between learning styles and academic performance using a correlational research design. Bangcola (2016) focused on 304 nursing students in Marawi City, utilizing the Perceptual Learning Style Questionnaire to identify four main learning styles (Visual, Auditory, Tactile, and Kinesthetic) and found a preference for the Kinesthetic style (78%). The study demonstrated that learning styles significantly predicted academic performance in nursing programs.

The current study in Anambra State examined study habits and learning styles as predictors of academic achievement among 825 SS II students, using standardized instrument (Learning Style Inventory) and multi-stage sampling. Data was collected through teacher-assisted direct delivery and analyzed with multiple regression. Thus, key similarities include the use of a correlational design and the investigation of learning styles as predictors of academic achievement. The differences lie in the sample sizes, geographic locations, academic levels (nursing students vs. secondary school students), and additional focus on study habits in the Anambra State study.

Magulod (2019) examined the learning style preferences, study habits and level of academic achievement of students enrolled in applied science courses of one campus of a public higher education institution in the Philippines. The study employed descriptive correlational research design to a total of seventy-five respondents who were purposively sampled. Two sets of standardized instruments were utilized by the researcher. After gathering the needed data, appropriate statistical tools were used to interpret the findings of the study. Descriptive statistics such as mean, frequency, rank and percentage were used. Inferential statistics such as independent sample t-test and one-way ANOVA were used to test the hypotheses of the study. Post-Hoc Tukey HSD test was also utilized to identify the significant differences among the categorical variables. Pearson r was used to test the significant relationship between the variables.

Results of the study revealed that the students of applied sciences courses preferred visual, group and kinesthetic as

major learning styles while they manifest a moderate level of study habits. They also have a good level of academic achievement. Test of difference revealed that academic performance, father's occupation and type of high school graduated from spelled significant differences in their perceptual learning styles. They also spelled differences in their study habits when grouped according to academic standing in high school, writing skills, mothers' education, and test anxiety. Finally, there were significant relationships between learning styles, study habits and academic performance of students in applied science courses. The implications of the study can guide instructors to plan and deliver suitable instructional interventions.

Both the reviewed study and the current study sought to investigate study habits and learning styles as predictors of academic achievement using correlational research designs. Magulod (2019) focused on applied science students in the Philippines, employing descriptive correlational design with 75 purposively sampled respondents, using standardized instruments, and analyzing data with descriptive and inferential statistics, including t-tests, ANOVA, and Pearson correlation. The current study in Anambra State targeted 825 SS II students, used a multi-stage sampling procedure, and employed standardized instrument (Learning Style Inventory). This study answered research questions with multiple regression analysis. The main differences lie in their sample sizes, geographic locations, specific statistical methods, and target academic levels (higher education vs. secondary school).

Ghanney, Appiah and Esia-Donkoh (2019)conducted a study on learning style preferences as determinants of academicachievement among public junior high school pupils in theEffutu municipality in the central region of Ghana. Two research questions guided the study. The descriptive survey design was used and was aligned with positivist paradigm where532 public junior high school pupils were chosen through the stratified random sampling technique. A reliability coefficient of not less than 0.70 was realized for all the various constructs. The data gathered through questionnaire were analysed using both descriptive (mean, standard deviation) and inferential (Pearson Moment Correlation) statistics.

The study revealed that the visual learning style was most dominantly preferred (M = 3.88, SD = 0.62), followed by kinesthetic (M = 3.67, SD = 0.72), and auditory (M = 3.58, SD = 0.66) learning styles. Besides, it was established that generally there was a strong and statistically significant positive relationship between learning styles preferences of pupils' and academic achievement (r = 0.861, p = 0.000,2-tailed). In relation with the present study, the reviewed study adopted similar variable. Nevertheless, the present study focused on senior secondary school students and adopted the correlation survey research design to fill the gap created by the reviewed study. In the same vein, the reviewed study was conducted outside the shores of Nigeria and may not entail what is applicable in the Nigerian setting hence the need for the

replication of this study in an area such as Anambra state.

In the same vein, Ikechukwu (2017) examined learning styles as predictors of students' academic achievement in Rivers State. Two research questions and corresponding hypotheses were formulated to guide the study. The correlation survey research design was employed. The participants in the study were1,269 (males = 627, females = 642) students drawn from public secondary schools in Rivers State, Nigeria. A multistage sampling technique was used to draw the sample of the study. Two valid instruments tagged, Visual, Aural, Read/write and Kinesthetic (VARK) questionnaire and Mathematics and English Achievement Test (MEAT) were used for the collection of data in the study. The reliability of VARK questionnaire was determined using Cronbach alpha with coefficient values of 0.75, 0.74, 0.77 and 0.76 for visual, aural, read/write and kinaesthetic learning styles respectively. The reliability for MEAT was determined using test-retest and coefficient value of 0.86 and 0.79 were obtained respectively. The research questions were answered using regression analysis (simple and multiple). The null hypotheses were tested at .05 alpha level.

The result of the study revealed that learning styles are statistically significant predictors of academic achievement of students. Again, male and female students differ significantly in their learning styles. This study is related with the present study. The reviewed study focused on a similar variable (learning style), which is also the interest of the present study. Both studies are also similar in terms of subjects, and the study design adopted. Nevertheless, based on the expansion in knowledge, the present study studied learning style, study habits as predictors of academic achievement of secondary school students in English language and mathematics in Anambra State. In view of this, the present study introduced an independent variable for advancement in knowledge.

Gabal and Hussien (2021) examined learning styles and academic achievement among medical students at Ain Shams University, Egypt: An experience during COVID-19 Era. Two research questions were raised to guide the study. A cross-sectional survey design was adopted for the study. A minimum sample size of 180 participants was calculated using the PASS 11-program for sample size calculation, after reviewing results from the previous relevant study, which showed that the auditory learning style had the least prevalence among other learning styles (13.46%), considering a margin of error of 5% and a confidence level of95%. Two hundred sixty-two medical students (262) accepted to participate in the study and were selected through a convenience sampling technique. The sample comprised 262 students. The instrument for data collection was an anonymous online self-administrated questionnaire, delivered through different social media applications such as (What's App, and Facebook) plus official students' platforms. The questionnaire consisted of 3 sections including socio-demographic data, academic achievement, and the Barsch Learning Styles Inventory. Data collected was analysed as follows; for categorical

variables, descriptive statistics were provided as frequencies and
percentages, and as mean and standard deviation for continuous variables when normally distributed and when not normally distributed, as median and interquartile range (IQR). Kruskal-Wallis test, Chi-square, ANOVA, Multiple linear regression.

The findings of the study revealed that unimodal pattern of learning was the most prevalent style among surveyed students; about half of them used the unimodal visual style (49.6%) while the trimodal style was the least (0.8%). The learning style (LS) preference did not differ between preclinical and clinical students. This study is related to the present study, as it focused on learning styles and academic achievement. However, the reviewed study sampled medical students in Egypt which is a different geographical study from the present study. This study further differs from the present study as it adopted the cross-section survey research design. These dissimilarities affect the generalizability of the findings of this reviewed study. This informs the present study to examine learning styles as predictors of academic achievement among secondary school students Anambra state.

Akinbobla (2015) investigated the effects of learning styles and instructional strategies on students' achievement in the concept of electricity in Nigerian senior secondary school physics. Three research questions guided the study and three hypotheses was tested at 0.05 level of significance. Quasi-experimental survey was adopted for the study. The sample for the study comprised 250 senior secondary two (SSII) physics students were used for the study. A purposive sampling technique was used to select six schools from the population. A quasi-experimental design was adopted for the study. Physics Achievement Test (PAT)with reliability coefficient of 0.82 using Kuder Richardson-21 and Index of Learning Style Questionnaire (ILSQ)with reliability coefficient of 0.88 using test-retest approach were the two instruments used for gathering the data. Analysis of covariance was used to analyze the data.

The results showed that guided discovery is the most effective instructional strategy for physics students with Sensing/Intuitive learning style, demonstration is the most effective instructional strategy for physics students with Sequential/Global learning style while conventional strategy is the most effective for physics students with Visual/Verbal learning style. The results also indicated that Active/Reflective learning style was placed second in the order of facilitating students' achievement in physics when taught with guided discovery, demonstration and conventional learning strategies respectively. This study is related to the present study in terms of variables studied, sample size, but differ in terms of location, study design and statistical tool adopted for data collection. In view of this the present study conducted a similar study in Anambra state adopting the correlation survey research design.

Nja, Umali and Asuquo (2019) conducted a study on the influence of learning styles on academic performance among Science Education undergraduates of the University of Calabar, Nigeria. Ex-post facto design was used for the study. The

target population included all Science Education students in the University of Calabar. Two instruments were used for the study, Learning Styles Questionnaire (LSQ) and 2017/2018 second semester examination raw scores for Introduction to Science Education Result (ISER). The Cronbach's Alpha reliability coefficient was used for LSQ and the reliability coefficient was calculated, ranging from 0.62 to 0.82. Proportionate stratified and random sampling techniques were employed to get the sample. A total of two-hundred Science Education undergraduate students were chosen at random from the population.

Findings showed that students have different learning styles preference. Data analysed revealed that there was a significant difference in student's choice of learning styles. There was a positive correlation between learning styles and academic performance of students. It was therefore recommended that teachers vary in their teaching methods and strategies to pave way for students to use different learning styles. In relation with the present study, this reviewed study only focused on the learning style. Nevertheless, the present study introduced additional independent variable and will be conducted among secondary schools in Anambra state.

Methods

Correlational survey research design was adopted for this study. According to Nworgu (2015), a correlational research design seeks to establish relationship between two or more variables as well as indicates the direction and magnitude of the relationship between the variables. Anambra State is the area of study. The population for this study comprises 18,787 Senior Secondary School two SS II students from 261 secondary schools situated in the six education zones in Anambra state (Aguata = 1899, Awka = 4476, Nnewi =2863, Ogidi = 3075, Onitsha = 5674 and Otuocha = 800) (Source: Anambra State Post Primary School Commission, PPSC, 2021/2022). The sample for this study comprised of 825 SS II students. The multistage sampling procedure was employed in selecting the sample size. Instruments for data collection are: Kolb Learning style inventory and Students Academic Achievement Scores in English language and Mathematics. Learning Style Inventory (LSI): In 1971, David Kolb developed the learning style inventory (LSI) to assess individual learning styles while individuals tested on the learning style inventory show many different patterns of scores. In the same vein the terms academic achievement score of SS II students in mathematics 2022/2023 academic session was be collected and included for the prediction and data analysis.They have been previously adopted and validated by experts and used in conducting studies in Nigeria. Based on this affirmation, they were adopted as instrument for data collection in the present study.The instruments have all been subjected to internal consistency reliability test using Cronbach alpha statistics among other reliability statistics. The standardized instruments adopted have been used to conduct studies in Nigerian setting among secondary school students. The administration of the instrument was done through direct delivery approach. By this

method, copies of the questionnaire were distributed personally to the respondents by the researcher with the help of 6 regular teachers who serve as research assistants. The classroom teachers/research assistants from the secondary schools sampled were enlightened on how to assist in matching each student's questionnaire response with their corresponding academic achievement result in Mathematics. A total of 825 copies of the questionnaires was distributed while 821 copies were retrieved. This represents 99.51% retrieval rate. The research questions and hypotheses were tested using multiple regression analysis to determine the R, R-square and R^2 adjusted.

Results

Research question One: What is the predictive value of secondary school students learning styles on their academic achievement in English Language in Anambra State?

Table 1: Linear Regression Analysis on the Predictive Value of Secondary School Students' Leaning Styles on Their Academic Achievement in English Language.

Variable	R	R^2	R^2 Changed	B	BETA	% var. added
Secondary School Student's learning style	0.386	0.148	0.148	-0.025	-0.046	-4.80

Table 1revealed that secondary school students' study habit had standardized Beta coefficient of -0.046. This indicates that secondary school students learning styles contributed -4.80 percent of their academic achievement in English language in Anambra State.

Hypothesis One: There is no significant prediction of secondary school students' learning style on their academic achievement in English Language in Anambra State.

Table 2: Regression analysis on the significant prediction of secondary school students' leaning styles on their academic achievement in English language.

Variable	R	R^2	R^2 Changed	B	BETA	% var. added	df	Cal. t	Alpha value	Pvalue	Remark
Secondary School Student's learning style	0.386	0.148	0.148	-0.025	-0.046	-4.6	819	-1.313	0.05	0.189	NS

NS=Significant

Data in Table 2 revealed that at 0.05 alpha level, with 1df numerator, 819df denominator, the calculated t1.313 and a Pvalue of 0.189, which is greater than 0.05 alpha value, the third null hypothesis is accepted. Therefore, there is no significant prediction of secondary school students' learning style on their academic achievement in English language in Anambra State.

Research Question Two: What is the predictive value of secondary school students learning styles on their academic achievement in Mathematics in Anambra State?

Table 3: linear regression analysis on the predictive value of secondary school students' learning style on their academic achievement in Mathematics.

Variable	R	R^2	R^2 Changed	B	BETA	% var. added
Secondary School Student's learning style	0.425	0.170	0.170	0.015	0.015	1.10

The results in Table 3 showed that secondary school students' study habit had standardized Beta coefficient of 0.015. This indicates that secondary school students learning style contributed 1.10 percent of their academic achievement in Mathematics in Anambra State.

Hypothesis Two: There is no significant prediction of secondary school students' learning style on their academic achievement in Mathematics in Anambra State.

Table 4: Regression analysis on the significant prediction of secondary school students' leaning style on their academic achievement in Mathematics.

Variable	R	R^2	R^2 Changed	B	BETA	% var. added	df	Cal. t	Alpha value	Pvalue	Remark
Secondary School Student's learning style	0.425	0.170	0.170	0.015	0.015	1.5	819	0.442	0.05	0.659	NS

NS=Significant

In Table 3, it was revealed that at 0.05 alpha level, with 1df numerator, 819df denominator, the calculated F 0.196 and a P-value of 0.659, which is greater than 0.05 alpha level, the fourth null hypothesis is rejected. Hence, there is no significant prediction of secondary school students' learning style on their academic

achievement in Mathematics in Anambra State.

Discussion of Findings

Findings of the study revealed that secondary school students learning style contributed -4.80 percent of their academic achievement, indicating that there is no significant prediction of secondary school students' learning style on their academic achievement in English language in Anambra State. The findings also revealed secondary school students learning style contributed 1.10 percent of their academic achievement in Mathematics, indicating that there is no significant prediction of secondary school students' learning style on their academic achievement in Mathematics in Anambra State.

The findings of the study indicate that secondary school students' learning styles do not significantly predict their academic achievement in either English Language or Mathematics in Anambra State. Specifically, the contribution of learning styles to academic performance in English was negative, suggesting no significant correlation. Similarly, the contribution to performance in Mathematics was minimal and also not significant. These results suggest that other factors beyond learning styles play a more critical role in students' academic achievements in these subjects. This challenges the common perception that tailoring education to individual learning styles will necessarily enhance academic outcomes.

Interestingly, these findings contrast with several other studies. For example, Ita, Ghanney, Appiah, and Esia-Donkoh (2019) conducted research on learning style preferences among junior high school pupils in Ghana, revealing a strong and statistically significant positive relationship between learning styles and academic achievement. This indicates that in other contexts, learning styles can be influential. Additionally, Ikechukwu's (2017) study in Rivers State found that learning styles were statistically significant predictors of students' academic achievement. Similarly, research by Gabal and Hussien (2021) at Ain Shams University in Egypt showed that learning styles predicted academic achievement among medical students. Furthermore, Nja, Umali, and Asuquo (2019) demonstrated that learning styles influenced academic performance among Science Education undergraduates at the University of Calabar, Nigeria.

These differing results could be due to various factors, such as differences in educational systems, cultural contexts, the subjects studied, or the levels of education. It is possible that in Anambra State, other factors such as teaching methods, available resources, and socio-economic conditions may overshadow the impact of learning styles on academic performance. Thus, while learning styles may not significantly predict academic achievement in English and Mathematics for secondary school students in Anambra State, they have been shown to be influential in other contexts and subjects. This suggests the need for a more understanding of the role of learning styles and indicates that educational strategies should be multifaceted, considering a range of factors that influence student performance.

These findings of the study also align with Akanni (2020), which found no significant relationship between learning styles and academic performance among secondary school students in Lagos State, suggesting that learning styles may not be a strong predictor of academic success at this educational level. However, these findings contrast with Bangcola (2016), which identified a significant relationship between learning styles and academic performance in nursing students. This discrepancy could be due to differences in educational settings, subject matter, and student demographics. Nursing programs, which often involve practical and hands-on learning, may benefit more from specific learning styles, while secondary school subjects like English and Mathematics may rely more on general study habits and teaching methods.

The negative contribution in English suggests that other factors, such as study habits, instructional methods, or socio-economic factors, might play a more critical role in influencing academic outcomes. This indicates that educational interventions in Anambra State should perhaps focus more on enhancing study habits and teaching methods rather than solely catering to individual learning styles. Therefore, the mixed results across studies underscore the complexity of academic achievement determinants and suggest that the impact of learning styles may vary significantly across different educational settings and subject areas.

Conclusion

Based on the conclusion of the study, the following conclusion is drawn.

Learning styles do not significantly predict academic achievement in either subject, with a minimal and sometimes negative predictive power. Interestingly, the combination of learning styles among others features has a small but significant predictive power for academic achievement in English, indicating that these factors together can influence performance in this subject. These findings suggest that educational strategies in Anambra State should prioritize improving study habits and consider a more holistic approach to address the diverse factors influencing academic achievement in English language and Mathematics.

Recommendations

Based on the findings of this study, the following recommendations was made;

1. Teachers should incorporate a variety of instructional strategies that cater to different learning styles. Given the prevalence of reflective observation and abstract conceptualization learning styles, educators should use methods that encourage reflection, critical thinking, and abstract reasoning alongside practical and hands-on activities.
2. Since learning styles have minimal impact on Mathematics achievement, schools should explore and address other factors affecting performance in this subject. This could involve providing specialized training for Math teachers, using interactive and technology-enhanced teaching tools, and addressing math anxiety through counseling and support programs.

3. Schools should actively involve parents in their children's education by providing workshops and resources that help them support effective study habits at home. Encouraging a partnership between parents, teachers, and counsellors can create a more supportive learning environment and reinforce good study practices outside the classroom.

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