
LEARNING STYLES AS CORRELATES OF ACADEMIC SELF-EFFICACY OF PUBLIC SENIOR SECONDARY SCHOOL STUDENTS IN RIVERS STATE

***Esukpa, Angela Chinwe, Prof. J. N. Onukwufor**

Department of Educational Psychology, Guidance and Counselling Faculty of Education,
University of Port Harcourt.

Article Received: 08 August 2026, Article Revised: 28 August 2026, Published on: 18 September 2026

***Corresponding Author: Esukpa, Angela Chinwe**

Department of Educational Psychology, Guidance and Counselling Faculty of Education, University of Port Harcourt.

Doi: <https://doi-doi.org/101555/ijarp.7940>

ABSTRACT

This study investigated the learning styles as correlates of academic self-efficacy of public senior secondary school students in Rivers State. The study was guided by four research questions and four corresponding null hypotheses. The design for the study was the correlational research design. The population for the study comprised all the 42,624 senior secondary II (SS2) students in the 278 public secondary schools in Rivers State. A sample of 623 students was used for the study. Multi-stage sampling procedure was adopted in drawing the sample. Two instruments were used for the study namely the Learning Styles Scale (LSS) and Academic Self-Efficacy Inventory (ASEI). The research instruments were validated by two expert. The construct validity was also done using factor analysis. To ensure the reliability of the instruments, Cronbach alpha (α) was used for all the instruments. The alpha coefficients of 0.88 and 0.92 for Learning Styles Scale (LSS) and Academic Self-Efficacy Inventory (ASEI) respectively. The data generated were analyzed using simple regression analysis. Specifically, research questions were answered using simple regression while hypotheses were tested using t-test associated with simple regression at 0.05 level of significance. Result revealed that learning styles (visual, auditory, kinesthetic and read/write) significantly relate to academic self-efficacy of public secondary school students in Rivers State. It was recommended among others that, school counsellors should play important role in the academic self-efficacy of students by offering them for appropriate techniques that will help boost their self-confidence.

KEYWORDS: learning styles, visual, auditory, kinesthetic, read/write and academic self-efficacy.

INTRODUCTION

Education appears to be the largest industry in Nigeria. In this regard, Government continues to ensure that funds, instructional material and teaching personnel are made available for the education sector for the purpose of bringing up a child and nourishing him or her with knowledge, morals, physical fitness and ability for him or her become independent and functional. Academic self-efficacy motivates the student to adopt specific and appropriate learning strategies that will help in realization of the academic goals. Academic self-efficacy is not related to the question of how much an individual likes himself or herself. It is also not concerned with what abilities or capacities a person possesses by actualizing potentialities that a child can have.

Academic self-efficacy is considered as a key factor contributing to learners academic performance as it influences the choices and decisions that learners make and the courses of action they pursue (Pajares, 2022). Students' beliefs in their efficacy in an academic environment, provide the foundation for motivation, and personal achievement. In addition, students with strong belief in their academic efficacy are more interested in academic activities by setting up challenging goals and working hard to achieve them (Fenollar et al., 2017). It can be seen in the behaviour of the students who have higher efficacy belief that they can demonstrate a high level of enthusiasm while working on the tasks, such as collecting assigned assignments on time, never complaining while an assignment is provided, and always attempting to complete the tasks despite the high level of difficulty. Meanwhile, others with lower academic self-efficacy often seem to choose and perform well on tasks that match their abilities, however, if the tasks are perceived to be too challenging, they avoid and ignore them which creates the problem of academic procrastination (Bandura as cited in Pajares, 2022). Students get information for evaluating their academic self-efficacy from their actual performances, vicarious experiences, persuasions from others, and physiological reactions related to the academic environment. It affects their task choice, effort, persistence, resilience, and achievement.

Academic self-efficacy (ASE) is one of the key factors for motivation and learning success. Academic self-efficacy is based on Bandura's social cognitive theory, which assumes a reciprocal influence of personal, behavioural and social/environmental factors. Self-efficacy is an individual's perceived ability to fulfil the tasks necessary for success. It relates to a

person belief that they can perform various steps and tasks to achieve academic success. Regardless of cognitive ability, individuals with high academic self-efficacy view problems as challenges, strive for high levels of success, focus on solving tasks, and view failures as a lack of knowledge rather than a lack of ability. Academic self-efficacy is very important in educational process because it influences students' academic motivation and success (Putwain et al., 2013). Students with higher self-efficacy are more engaged in learning, participate more, work and invest in achieving goals, and “struggle” longer with difficulties (Hsieh et al., 2017).

Academic self-efficacy is of interest to everyone especially those who understand the value of quality education. It is to this effect that corporate organizations, private individuals and public funds are being invested into the educational system to ensure there is the production of efficient, qualified, skilled and effective citizens in any given nation who later become the stronghold of economic and civil development in such societies. Belfield and Levin (2012) argued that academic self-efficacy has been linked to several influences distinctive to the home environment, such as learning styles and emotional intelligence etc. Learning styles of students and emotional intelligence is made even harder by the fact that all students would like to succeed in their academics. The task of learning styles and emotional intelligence is one of the important variables widely investigated in the field of human development.

Self-efficacy influences individuals when they are reasoning and evaluating a situation and completing a task. Self-efficacy, also known as perceived ability, is a term used to refer to the confidence that people have in their abilities to succeed in a given task (Tehere, 2023). According to Bandura as cited in Loo and Choy (2023), self-efficacy is defined as beliefs in one's capabilities to organize and execute the course of action required to produce given attainments. High self-efficacy helps kids tackle difficulties, learn from mistakes, and build a positive outlook, while low self-efficacy can lead to avoiding challenges. In many activities, including academic ones, self-efficacy influences how people approach new challenges. It therefore contributes to performance since the beliefs influence thought processes, motivation and behaviour (Tehere, 2023). The interpretation of the past successes and failures are responsible for subsequent success or failure in tasks. Therefore, academic achievement is generally regarded as the outcome of learning.

Lent, et al. as cited in Hayashi (2020) asserted that academic self-efficacy refers to the level of confidence that a student feels with regards to his or her ability to successfully complete academic tasks or reach academic milestones. With the continuous change and technological innovations present in this 21st century, academic self-efficacy is a vital key to liberate a

nation from the shackles of poverty such as the case of Nigeria (Belfield & Levin, 2014). It is the joy of every parent or caregiver to see their child/ward succeed academically, considering the vast resources invested in their overall development. Unfortunately, even with such investment and support provided by corporate organizations and private individuals to maintain better academic performance of students, it has still not yielded the expected result and to a large extent there is still noticeable academic failure experienced among students.

Most of the times academic failure can be traced to bad learning styles and lack of motivation which is a major function of an individual's emotional strength. Lately researchers have engaged in several research works in order to give definitions to the predictors of educational success. According to Gardner (2016), one who is able to identify his or her emotions as well as that of others is termed an emotionally intelligent individual. To him this form of intelligence is likened as intrapersonal and interpersonal. The ability to organize an exact and true nature of oneself and to be able to use that nature to operate effectively in life is intrapersonal intelligence while the capacity to know people, understand things which motivates them, grasp how they work, and be able to work cooperatively with them is interpersonal intelligence. This is to say that when an individual is not able to comprehend the whole essence of being emotionally intelligent as stated above, academic self-efficacy will remain a mirage to such a person. Kahyaoglu (2013) stated that emotional condition has always been considered as a major factor which brings about academic self-efficacy amongst students. One's state of emotion could negatively affect his or her academic self-efficacy if not well managed. To him a child who is emotionally challenged exhibits the following characteristics. An inability to learn, which is not traced to any form of intellectual, sensory, neurophysiological or general health challenges. Such individual may develop a mood of unhappiness or depression, looks sad, with inability to relate very well with peers, instructors and those seen around him, and becomes very distracted easily. Thus when an individual is not committed to learn or not psychologically disposed to learn, even if he has the ability to do so, and has also attained the maturational level.

Academic self-efficacy can be associated with several context specific learning-related skills and behaviours important for self-regulated learning (Schunk, 2015). Students' belief in their ability to engage in self-regulated learning is most prominent in higher education, which requires more autonomy and self-management (Sander & Sanders, 2019). According to Bandura's theory, there are four sources of self-efficacy: one's own previous experiences in similar situations, exposure to and identification with effective models (vicarious learning

from returned information and emotional arousal) (Bandura as cited in Sander & Sanders, 2018). Above all, one's own experiences characterize self-efficacy; repeated experiences of failure, for example, reduce self-efficacy (Bandura as cited in Sander & Sanders, 2018). Research shows that self-efficacy is related to various academic and learning tasks. Cheng and Chiou (2020) found positive correlation between self-efficacy and test performance of accounting students. Klassen (2020) found that self-efficacy for self-regulatory learning made significant contribution to end of the term English grades in adolescents. Michaelides (2018) reviewed various research studies which found relationship between efficacy beliefs and performance in mathematics. Michaelides (2018) found a positive correlation between self-efficacy and science performance of primary school children. There have been lots of factors influencing academic self-efficacy but this study focused on learning styles.

Learning styles refer to a range of theories that aim to account for differences in individuals' learning. Although there is ample evidence that individuals express personal preferences on how they prefer to receive information. Many theories share the proposition that humans can be classified according to their "style" of learning, but differ on how the proposed styles should be defined, categorized and assessed. A common concept is that individuals differ in how they learn. The view of most educators is that student's learning styles should be incorporated into the learning environment and classrooms (Honigsfed & Dunn, 2016). The essence of learning styles is to allow for multiple ways individuals think, respond, see, hear, touch, justify and reproduce ideas. As soon as an individual's learning style is known and developed, such learner will have a good understanding on how to effectively function in the learning environment and meet mental and emotional requirements. Fleming (2011) defined learning styles as an individual's characteristics and preferred ways of gathering, organizing and thinking about information. This is to say that it is a consistent way of behaviour and performance in which an individual approaches teaching and learning experiences. It means the pattern an individual pays attention to and his method in receiving and processing information and experiences. People receive and define information in diverse ways.

Unfortunately most learners do not understand this as a result of their contact with instructors or teachers whose mode of teaching goes in one direction and as such do not expose students to their natural or preferred styles of learning. Many people recognize that each person prefers a learning style and technique, and by recognizing and understanding one's own learning style, one can use that technique or style best suited to him or her.

One cannot talk about academic self-efficacy without having a clear understanding of the fundamentals of learning styles, in the same vein you cannot expect high academic

performance among students without first ensuring they have a clear understanding of how they learn, this is because students learning style have more influence on them than they may realize (Abangowe, 2018). The way a student learns is as a result of the style he/she chooses and little do they understand that these styles or techniques shape the pattern they internalize their experiences, the way they retrieve such experience and even their choice of words.

Flaming (2011) who authored the VARK (visual, auditory, read/write and kinesthetic) model, in like manner defined it as an individual's characteristics and preferred ways of gathering, organizing and thinking about information. Visual learning refers to a mode of learning where students rely on graphic aids to remember and learn material. Visual learners can easily visualize objects, have a great sense of balance and alignment, are very color-oriented and can effortlessly envision imagery. Here learners have a preference for what can be seen, that is to say learners in this learning style learn by seeing things like pictures, graphs, charts, diagrams, symbols, etc. The auditory learning style is characterized by a reliance on the sense of hearing as the primary means of absorbing and making sense of new information. Auditory learners tend to excel in activities that involve listening to lectures, participating in group discussions, following verbal instructions, and engaging with multimedia presentations that incorporate audio elements (Jack, 2016). The role of auditory learning in enhancing memory retention, deepening understanding, and promoting active engagement for students cannot be overstated. Auditory learners often find that they can better comprehend and recall information when it is presented to them through verbal means, as opposed to solely relying on visual or kinesthetic modalities. Learners in this dimension have preference for what can be heard, that is the best learning is listening to lecturers, recordings, discussions, etc (Jack, 2016).

Read/write learning style referred to as the second visual style, reading and writing is a type of learning during which people prefer to read and write in order to learn more effectively. These learners are known as read and write learners and usually learn best by reading and writing the information down. This style is commonly used by both learners and teachers in the process of learning (Khanal, et al. 2019). It entails the display of information in words. Students with a reading/writing preference had better academic performance. The results of this study provide useful information for preparing a more problem-based curriculum with active learning strategies (Khanal, et al. 2019).

Kinesthetic learning style is a style of obtaining information. Kinesthetic learning's primary premise is that a student learns best when shown simulations, presentations and videos or when moving around in a hands-on environment. In this category, learners prefer to learn via

experience. In other words they best learn through active participation, experiments, science projects, etc. Kinesthetic learning styles are more dominant in learning through direct practice, or through movement or the power of sensation (Sen, 2019). Some of the characteristics possessed by students with kinesthetic learning styles include learning through manipulation and practice, memorizing by walking and seeing, using fingers as pointers when reading, using lots of body gestures, unable to sit still for long periods of time, likes games that keep him busy etc. This method is learner-centered which allows the learner to see, touch and manipulate objects while learning of subjects such as mathematics are more of seeing and doing than hearing; so also, with science that advocates ‘do it yourself’.

The ongoing illustrates that students do have specific learning choice and these choices may vary according to gender. Claudia (2019) strongly believe that male and female students learn differently. It is more important to note that academic self-efficacy is not possible when a student does not identify and capitalize on his/her learning styles. Claudia (2019) strongly stated that kids without emotional intelligence do not follow directions, they cannot pay attention and have difficulty working cooperatively. With this, aiming for academic self-efficacy is relatively impossible because when one lacks direction and coordination emotionally, achieving anything good even academically cannot be ascertained.

From the researcher’s observation, it is important to note that learning style are obvious phenomena which may influence students’ academic efficacy. How a student conducts himself when alone and when with others to an extent relate with emotional intelligence which also influence how he or she receives, process and uses information as part of his or her learning styles. It is important to note here that one cannot emphasize more on students’ academic self-efficacy without ensuring how motivated and dedicated they are towards their academic studies and to ascertain this is by focusing in the areas relating to learning styles and how they influence academic self -efficacy. This will go a long way in helping students to understand how they can pattern themselves towards their studies in order to achieve academic self-efficacy.

A major desire among teachers, education policy makers, psychologists, school guidance counsellors and related professionals is to see how best they could explain and predict variations in students’ academic self-efficacy. Numerous research works have been carried out with the intention to define and illustrate the underlying factors or variables which could effectively explain or predict academic self-efficacy of students. Some of these factors include locus of control, motor skills, self-concept, academic skills, study habit and others. In spite of these efforts, lack of academic self-efficacy still remain a common threat among

students thereby leading to continuous failure in various subjects and examinations. A typical example is the November/December 2023 WASSCE (WAEC) with mass failure and many results were withheld for examination malpractice.

Lack of academic self-efficacy affects individuals at different levels of life's endeavour. Some students have given up on their pursuit to be academically viable as a result of failures they encountered not knowing the reasons for their low performance in such given tasks. They have become frustrated and eventually drop out. They found out their best achievement could only lead them to be low income earners, unemployable, and do not have the required skills needed to be productive.

Although there are debates as to whether emotional intelligence affects students' academic self-efficacy. Studies tend to have supported learning styles as a correlate of students' academic self-efficacy, while others do believe that learning styles do not play a major role in students' academic self-efficacy. It is from the forgoing that it became imperative to investigate whether learning styles relate with academic self-efficacy of public senior secondary school students in Rivers State.

Aim and Objectives of the Study

The aim of the study is to investigate learning styles as correlate of academic self-efficacy of public senior secondary school students in Rivers State.

1. Examine the relationship between visual learning style and academic self-efficacy of students in public senior secondary schools in Rivers State,
2. Find out the relationship between auditory learning style and academic self-efficacy of students in public senior secondary schools in Rivers State,
3. Investigate the relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State,
4. Examine the relationship between reading/writing learning styles and academic self-efficacy of students in public senior secondary schools in Rivers state.

Research Questions

The following research questions were postulated by the researcher which guided this study.

1. What is the relationship between visual learning style and academic self-efficacy of students in public senior secondary schools in Rivers State?
2. What is the relationship between auditory learning style and academic self-efficacy of students in public senior secondary schools in Rivers State,

3. What is the relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State?
4. What is the relationship between reading/writing learning styles and academic self-efficacy of students in public senior secondary schools in Rivers state?

Hypotheses

The following null hypotheses were postulated which guided the study and were tested at 0.05 alpha level.

1. There is no significant relationship between visual learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.
2. There is no significant relationship between auditory learning style and academic self-efficacy of students in public s senior secondary schools in Rivers State.
3. There is no significant relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State,
4. There is no significant relationship between reading/writing learning styles and academic self-efficacy of students in public senior secondary schools in Rivers state.

METHODOLOGY

The study adopted correlational research design, to examine the relationship between dependent variable and independent variables. Correlation research design is used in a situation where the researcher seeks to establish the relationship between two or more variables. The population for the study comprised all the 42,624 senior secondary II (SS2) students in the 333 public secondary schools in Rivers State. The sample size for the study was 623 senior secondary school students which were drawn using multi-stage sampling process. Five instruments were used for the study namely the Learning Styles Scale (LSS) and Academic Self-Efficacy Inventory (ASEI). In order to validate the research instrument, the researcher consulted two experts. To ensure the reliability of the instruments Cronbach alpha (α) technique was used for both instrument. The coefficients obtained are 0.88 and 0.92 for Learning Styles Scale (LSS) and Academic Self-Efficacy Inventory (ASEI) respectively. This showed that the instruments were reliable enough for the study. The researcher used three research assistants in administering copies of the instruments. The data generated were analyzed using simple regression analysis. Specifically, research questions were answered using simple regression while hypotheses were tested using t-test associated with simple regression at 0.05 level of significance.

RESULTS

Research Question One: What is the relationship between visual learning style and academic self-efficacy of students in public senior secondary schools in Rivers State?

Table 1: Simple regression table showing the relationship between visual learning style and academic self-efficacy

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
	.151	.023	.021	14.59

Table 1 on the relationship between visual learning style and academic self-efficacy showed that an R value of 0.151 was gotten with an R² value of 0.023 and an adjusted R² of 0.021. On the basis of the R² value obtained, it can be seen that visual learning style accounted for 2.3% variation in the academic self-efficacy of students in public senior secondary schools in Rivers State. That means visual learning style has a low positive relationship with academic self-efficacy of students in public senior secondary schools in Rivers State.

Hypothesis One: There is no significant relationship between visual learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Table 2: Summary of analysis, of regression associated with t-test on the relationship between visual learning style and academic self-efficacy.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	B	Std. Error	Beta			
(Constant)	36.801	3.591		10.247	.000	Significant
Visual learning style	.703	.184	.151	3.815	.000	

Table 2 showed that the beta of .151 and a t-value of 3.815 was obtained when the obtained regression coefficient was tested for significance, based on the sig-value of 0.000 which is less than the alpha of 0.05. This result therefore indicates that visual learning style significantly relate with academic self-efficacy of students in public senior secondary schools in Rivers State. The null hypothesis was therefore rejected.

Research Question Two: What is the relationship between auditory learning style and academic self-efficacy of students in public s senior secondary schools in Rivers State?

Table 3: Summary simple regression of the relationship between auditory learning style and academic self-efficacy.

R	R ²	Adjusted R ²	Adj Error of the estimate
.099	.010	.008	14.695

Table 3 Shows that the joint relationship between auditory learning style yielded an R value of 0.099 this is, alongside a coefficient of determination R^2 of 0.010 and an adjusted coefficient of determination an (adj R^2) of 0.008, it is deduced that 1.0% of the changes in academic self-efficacy are dependent on the changes of the combined effect of self-efficacy. On the other hand, the remaining, 99% of the changes in academic self-efficacy of students in public senior secondary schools in Rivers State are attributable to factors outside auditory learning style. This showed that self-efficacy auditory learning style has a low positive relationship with academic self-efficacy.

Hypothesis Two: There is no significant relationship between auditory learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Table 4: Summary of analysis, of regression associated with t-test on the relationship between auditory learning style and academic self-efficacy.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	B	Std. Error	Beta			
(Constant)	40.166	4.133		9.719	.000	Significant
Auditory learning style	.376	.152	.099	2.482	.013	

Table 4 showed that the beta of .099 and a t-value of 2.482 was obtained when the obtained regression coefficient was tested for significance, based on the sig-value of 0.013 which is less than the alpha of 0.05. This result therefore indicates that auditory learning style significantly relate with academic self-efficacy of students in public senior secondary schools in Rivers State. The null hypothesis was therefore rejected.

Research Question Three: What is the relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State?

Table 5: Simple regression table showing relationship between kinesthetic learning style and academic self-efficacy among students in public senior secondary schools in Rivers State.

R	R²	Adjusted R²	Adj Error of the estimate
.203	.041	.040	14.460

Table 5 on the relationship between kinesthetic learning style and academic self-efficacy showed that an R value of 0.203 was gotten with an R² value of 0.041 and an adjusted R² of 0.040. On the basis of the R² value obtained, it can be seen that kinesthetic learning style accounted for 4.1% variation in the academic self-efficacy among students in public senior secondary schools in Rivers State. The remaining 95.9% can be attributed to other variables outside kinesthetic learning style. This result showed that there is a very low positive relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Hypothesis Three: There is no significant relationship between kinesthetic learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Table 6: Summary of analysis, of regression associated with t-test on the relationship between kinesthetic learning style and academic self-efficacy.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	B	Std. Error	Beta			
(Constant)	29.853	4.001		7.461	.000	Significant
Kinesthetic learning style	.737	.143	.203	5.169	.000	

Table 6 showed that the beta of .203 and a t-value of 5.169 was obtained when the obtained regression coefficient was tested for significance, based on the sig-value of 0.005 which is less than the alpha of 0.05. This result therefore indicates that kinesthetic learning style significantly relate with academic self-efficacy of students in public senior secondary schools in Rivers State. The null hypothesis was therefore rejected.

Research Question Four: What is the relationship between reading/writing learning style and academic self-efficacy of students in public senior secondary schools in Rivers state?

Table 7. Summary of simple regression of the relationship between academic self-efficacy by reading/writing learning style.

R	R ²	Adj.R ²	Std error of the estimate
.214	.046	.044	14.427

Table 7 showed that a linear regression coefficient obtained for the relationship between academic self-efficacy by reading/writing learning style among adolescents in Rivers State, R value was 0.214, while the coefficient of determination, R² was 0.046, and the adjusted R² was 0.044. Based on R² value, it therefore indicates that 4.6% of the variations in academic self-efficacy of students in public senior secondary schools in Rivers State can be attributed and explained by their reading/writing learning style while the remaining 95.4% can be attributed to other factors. This result showed that there is a moderate positive relationship between reading/writing learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Hypothesis Four: There is no significant relationship between reading/writing learning style and academic self-efficacy of students in public senior secondary schools in Rivers State.

Table 8: Summary of analysis, of regression associated with t-test on the relationship between reading/writing learning style and academic self-efficacy.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Result
	B	Std. Error	Beta			
(Constant)	26.718	4.368		6.117	.000	Significant
Read/write learning style	.840	.154	.214	5.451	.000	

Table 8 showed that the beta of .214 and a t-value of 5.451 was obtained when the obtained regression coefficient was tested for significance, based on the sig-value of 0.000 which is less than the alpha of 0.05. This result therefore indicates that reading/writing learning style significantly relate with academic self-efficacy of students in public senior secondary schools in Rivers State. The null hypothesis was therefore rejected.

DISCUSSION OF FINDINGS

Visual Learning Style and Academic Self-Efficacy

From the analysis of research question one and the corresponding null hypothesis in table 2, it was shown that visual learning style significantly relate to academic self-efficacy of students in public senior secondary schools in Rivers State. This relationship was found to be

statistically significant when tested at 0.05 level of significance. This result means that students who scored high in the section of visual learning style also scored high in academic self-efficacy while those who scored low in visual learning style also scored low in academic self-efficacy. This result is not surprising to the researcher because visual learning is a mode of learning where students rely on graphic aids to remember and learn material. Visual learners can easily visualize objects, have a great sense of balance and alignment, are very color-oriented and can effortlessly envision imagery. And visual learning style gives the learner very high confidence that he will perform better in any subject.

This result is similar to that obtained by Tehere (2023) who evaluated the effect of learning style and General Self-Efficacy (GSE) on satisfaction of e-Learning in dental student. The correlation between satisfaction and the dimensions of learning style showed that the active dimension of processing information had a significant relationship with the level of satisfaction. In the understanding dimension, a relatively strong correlation was observed in the Global dimension. Moderate significant relationship between the total score of self-efficacy and the level of satisfaction has been found. The results of the present study highlight the necessity of more studies regarding defining effective on student satisfaction during e-Learning. GSES and active learning style in the processing dimension and global learning style in the understanding dimension affect students' satisfaction.

The finding of this study is also similar to the findings of Okonkwo, et al. (2023) who examined self-efficacy and learning styles as predictors of academic performance among secondary school Chemistry students in Ogbaru Local Government Area of Anambra state. Findings show that self-efficacy and learning styles significantly predict academic performance among secondary school Chemistry students in Ogbaru L.G.A of Anambra state. Finally, this result is in disagreement with the findings of Azizollah (2016) who investigated the relationship between Students learning style and self-efficacy? A significant relationship was found between student's gender and their efficacy. Females showed a higher level of efficacy. Despite this there wasn't any significant relationship between student's gender and their learning styles. The ANOVA test showed a significant relationship between student's learning styles and efficacy.

Auditory Learning Style and Academic Self-Efficacy

From the analysis of research question two and the corresponding null hypothesis in table 4, it was shown that auditory learning style had a significant relationship between academic self-efficacy of students in public senior secondary schools in Rivers State. The relationship

is statistically significant at 0.5 level of significance. This result implies that students who scored highly on the section of auditory learning style are prone to score low in their academic self-efficacy. However, the reported relationship indicates that all those who score high in auditory learning style also scored low in academic self-efficacy. The result that auditory learning style relate to academic self-efficacy of students in public senior secondary schools in Rivers State is not surprising to the researcher. Because auditory learning helps a student learns effectively by listening. They would prefer listening to a lecture over reading a textbook, or hearing the instructions for a project instead of figuring it out hands-on.

This result is similar to that obtained by Matthew (2016) who examined learning styles of first year students entering college and school adjustment in Fairfield University to help them incoming students negotiate the high school-to-college transition. Preliminary results indicated a great diversity in the learning styles at the university. Females performed better adjustment than males. Reflective learners had a greater difficulty academically than the active learners. Data also suggest a trend where more reflective learners than active learners are on academic probation. Implications for future research and intervention strategies were also discussed. Also this findings is in line with that of Mutua (2013) who determined the relationship between learning style and academic achievement among secondary school students in Kenya'. The findings indicate that majority of the students are trimodal learners, followed by bimodal (VA) learners and thirdly by unimodal (V) learners. The least preferred learning style is the single kinesthetic modality which was preferred by only 2 female students. There is no significant difference in learning style preference among male and female students and among high and low academic achievement groups. There is strong positive and statistically significant relationship between learning styles and academic achievement for the trimodal learners, and among male and female students.

Finally, the findings is in line with the findings of Khalid (2013) who examined the influence of students' learning styles on academic achievements of 101 students' in the arts and science streams in the northern part of West Malaysia. Findings from the data analysis show that respondents prefer the dependent learning style followed by cooperation in all the variables namely gender, class, ethnic, family income and students' academic achievement. Pearson Product Moment Correlation analysis showed no significant relationship between learning styles as a whole with academic achievements, except for avoidance. The main findings also showed no significant relationship between learning styles and academic achievements.

Kinesthetic Learning Style and Academic Self-Efficacy

The study revealed in table 6 that kinesthetic learning style does significantly relate to academic self-efficacy among students in public senior secondary schools in Rivers State. The null hypothesis was therefore rejected. The relationship is statistically significant at 0.5 level of significance. This result implies that students who scored highly on the section of kinesthetic learning style are prone to score high in their academic self-efficacy. However, the reported relationship indicates that all those who score high in kinesthetic learning style also scored high in academic self-efficacy. The result that kinesthetic learning style relate to academic self-efficacy of students in public senior secondary schools in Rivers State is not surprising to the researcher. This is because kinesthetic learning's primary premise is that a student learns best when shown simulations, presentations and videos or when moving around in a hands-on environment.

The result from this study is similar to that obtained by Uzuntiryaki (2017) who carried out an investigation on the effect of students' learning styles on their chemistry achievement, and whether matching between teaching and learning style also affects students' chemistry achievement. Results reviewed a statistically significant difference among students with different learning styles with respect to chemistry achievement. Students in facilitator/personal model/expert teaching style and delegator/facilitator/expert teaching style had better understanding of chemistry concepts, but there was no statistically significant effect of matching between students' learning styles and teachers' teaching styles on students' chemistry achievement. In a similar study, Okonkwo, et al. (2023) who examined self-efficacy and learning styles as predictors of academic performance among secondary school Chemistry students in Ogbaru Local Government Area. Findings show that self-efficacy and learning styles significantly predict academic performance among secondary school Chemistry students in Ogbaru L.G.A.

Also Abdel (2020) who investigated the impact of kinesthetic learning style training on kinesthetic learning style, subjective well-being and academic self-efficacy of 30 Iranian female secondary students which randomly were placed in experimental and control groups. The results showed a significant difference between kinesthetic learning style and well-being scores in pre-test, post-test and follow-up for the experimental group. In addition, kinesthetic learning style training improved math scores in post-test and in the follow-up for the experimental group.

Finally, this result is in line with the finding of Azizollah (2016) who investigated the relationship between Students learning style and self-efficacy? Material and Methods: This is

a cross-sectional study. A significant relationship was found between student's gender and their efficacy. Females showed a higher level of efficacy. Despite this there wasn't any significant relationship between student's gender and their learning styles. The ANOVA test showed a significant relationship between student's learning styles and efficacy.

Reading/Writing Learning Style and Academic Self-Efficacy

From the analysis of research question three and the corresponding null hypothesis in table 8, it was shown that reading/writing learning style does significantly relate to academic self-efficacy of students in public senior secondary schools in Rivers State. This relationship was found to be statistically significant when tested at 0.05 level of significance. This result means that students who scored high in the section of reading/writing learning style also scored low in academic self-efficacy while those who scored low in reading/writing learning style also scored low in academic self-efficacy. This result is not surprising to the researcher because some learners find writing, reading articles, and taking notes to be most helpful when learning. If they find that they understand and retain information better once they have written it down, they are likely to be a reading/writing learner.

The findings of this result are a further confirmation of that obtained by Tehere (2023) who evaluated the effect of learning style and General Self-Efficacy (GSE) on satisfaction of e-Learning in dental student. The results of the reliability test showed that Cronbach's alpha index for the self-efficacy and satisfaction questionnaire was 0.836 and 0.96, respectively. The correlation between satisfaction and the dimensions of learning style showed that the active dimension of processing information had a significant relationship with the level of satisfaction. In the understanding dimension, a relatively strong correlation was observed in the Global dimension. Moderate significant relationship between the total score of self-efficacy and the level of satisfaction has been found. The results of the present study highlight the necessity of more studies regarding defining effective on student satisfaction during e-Learning. GSES and active learning style in the processing dimension and global learning style in the understanding dimension affect students' satisfaction.

Also this study is in agreement with the finding of Matthew (2016) who examined learning styles of first year students entering college and school adjustment in Fairfield University to help them incoming students negotiate the high school-to-college transition. Preliminary results indicated a great diversity in the learning styles at the university. Females performed better adjustment than males. Reflective learners had a greater difficulty academically than the active learners. Data also suggest a trend where more reflective learners than active

learners are on academic probation. Implications for future research and intervention strategies were also discussed.

Finally, the finding is in line with that of Court and Molesworth (2013) who carried out a study on second year undergraduate Marketing Communication students using three of the six GRSLS learning styles, including dependent, independent, and collaborative. Interviews with a small sample of students were conducted to get deeper information not obtained through the questionnaire. Most online students were dependent learners. They preferred precise direction, their notes contained most of the information given to them in class by a tutor, they wanted detailed notes and hand-outs to reduce ambiguity, and over half of the students relied on lecturers to tell them what they needed to know. These students also preferred highly organized sessions and wanted close supervision on course projects. The information about the students was similar to what Grasha noted as having a dependent learning style.

CONCLUSION

The study concludes that learning styles (visual, auditory, kinesthetic and read/write) significantly relate to academic self-efficacy among public secondary school students in Rivers State. This finding suggests that the way students prefer to receive, process and understand information is associated with their confidence in their ability to successfully perform academic tasks. Therefore, recognizing and accommodating diverse learning preferences may help strengthen students' academic self-efficacy and improve their engagement with learning activities.

Recommendations

Based on the results and findings, the following recommendation were made:

1. Teachers should employ a variety of teaching methods that accommodate visual, auditory, kinesthetic and read/write learning preferences, rather than relying on a single instructional approach.
2. School counsellors should help students identify their preferred ways of learning and guide them on how to use appropriate study strategies to improve their confidence and academic self-efficacy.
3. School administrators should provide adequate instructional materials such as charts, diagrams, audio-visual resources, textbooks, practical materials and digital learning resources to support different learning styles.

4. Teachers should encourage students to participate actively in classroom activities through discussions, demonstrations, practical exercises, note-taking, reading and visual presentations. Such varied activities may enhance students' confidence in their ability to accomplish academic tasks.
5. Parents should provide supportive home-learning environments and encourage students to adopt study techniques that correspond with their learning preferences while also developing flexibility in using other learning approaches.

REFERENCES

1. Abangowe, T. (2017). *Relationship between Learning Styles and School Adjustment in Abia State*. Msc Dissertation University of Port Harcourt.
2. Abdel, K. (2020). The impact of self-confidence training on self-confidence, subjective well-being and academic self-efficacy of 30 Iranian female secondary students. *Procedia - Social and Behavioural Sciences* 5:1447-1450
3. Azizollah, Z. (2016). The relationship between Students learning style and self-efficacy. *Journal of Vocational Behaviour. Elsevier*; 68(1): 73–84.
4. Belfield, W. & Levin, D. S. (2017). Comparison of learning styles and other characteristics of site-based, hybrid and online students. *Dissertation Abstracts International*, 66 (03), 874A. (UMI No. 3166920.
5. Cheng, P. & Chiou, W. (2020). Achievement, attribution, self-efficacy and goal setting by accounting undergraduates. *Psychological Reports*, 106(1), 1-11
6. Claudia, A. (2019). The relationship between level of self-confidence, academic performance and various components of anxiety in a sample of Mexican high school or secondary students. *Journal of Consulting & Clinical Psychology*. 58, 845-854.
7. Court, F. & Molesworth, R. (2013). Undergraduate Marketing Communication students using three of the six GRSLSS learning styles, including dependent, independent, and collaborative. *The Iranian Journal of Education in Medicine*, 7(1), 137-142.
8. Fenollar, P., Roman, S. & Cuestas, P. (2017) University students' academic performance: an integrative conceptual framework and empirical analysis, *British Journal of Educational Psychology*, 77(4), 873–891.
9. Fleming, N. (2011). *Teaching and learning styles: VARK strategies*. ND Fleming.
10. Gardner, H. (2016), *Frames of mind: A Theory of multiple intelligences*. Basic Books.
11. Hayashi, K. (2020). Students with learning disabilities in higher education: Academic strategies profile. *Journal of learning disabilities*, 36(3), 248-258.

12. Honigsfield, A. & Dunn, R. (2016). *Learning style characteristics of adult learners*. Delta Kappa Gamma Bulletin.
13. Hsieh, P., Sullivan, J. R., & Guerra, N. S. (2017). A closer look at college students: Self-efficacy and goal orientation. *Journal of advanced academics*, 18(3), 454-476.
14. Kahyaoglu, B. (2013). The comparison between gifted students and non-gifted students learning style and their motivation style. *Community mental health Journal*, 54, 1245-1252.
15. Khalid, S. (2013). The influence of students' learning styles on academic achievements of 101 students' in the arts and science streams in the northern part of West Malaysia. *Journal of Clinical Psychology*, 36, 364-429
16. Khanal, J. C., Agars, M. D., & Lopez-Wagner, M. C. (2019). The role of personality and motivation in predicting early college academic success in non-traditional students at a Hispanic-serving institution. *Learning and Individual Differences*, 18(4), 492-496.
17. Klassen, R. M. (2020). Confidence to manage learning: The self-efficacy for self-regulated learning of early adolescents with learning disabilities. *Learning Disabilities Quarterly*, 33, (Winter, 2020), 19-30.
18. Loo, C. W., & Choy, J. L. F. (2023). Sources of self-efficacy influencing academic performance of engineering students. *American Journal of Educational Research*, 1(3), 86-92
19. Matthew, U. (2016). Learning styles of first year students entering college and school adjustment in Fairfield University. *African journal of science, Technology and Mathematics Education*, 1(1), 96-102.
20. Michaelides, M. (2018). Emerging themes from early research on self-efficacy beliefs in school mathematics. *Electronic Journal of Research in Educational Psychology*, 6(1), 219-234
21. Mutua, D. (2013). The relationship between learning style and academic achievement among secondary school students in Kenya. *Iranian Journal of Medical Education*, 7(1), 137-142.
22. Okonkwo, I. G., Egolum, E. D & Samuel, N. N. C. (2023). Self-efficacy and learning styles as predictors of academic performance among secondary school chemistry students in Anambra State, Nigeria. *UNIZIK Journal of STM Education*, 6(1), 149-157.
23. Pajares, F. (2022). Gender and perceived self-efficacy in self-regulated learning. Theory into Practice, *Creative Education*. 6(11), 116-225.

24. Putwain, D., Sander, P., & Larkin, D. (2013). Academic self-efficacy in study-related skills and behaviours: Relations with learning-re-lated emotions and academic success. *British Journal of Educational Psychology*, 83(4), 633-650.
25. Sander, R. & Sanders, J. O. (2018). The impact of motivation on secondary school student's achievement in mathematics in Ishielu local government area of Ebonyi state. *Educational Research and reviews* 5(5): 213-217.
26. Schunk DH. (2013). *Self-efficacy and academic motivation*. Educ Psychol. 26:207–231.
27. Sen, A. (2019). Primary schooling in West Bengal. *Prospects quarterly review of comparative education*, 155(3), 311-320.
28. Tehere, M. (2023). The effect of learning style and General Self-Efficacy (GSE) on satisfaction of e-Learning in dental student. *BMC Medical Education*, 21(463), 55-64
29. Uzuntiryaki, S. (2017). The effect of students' learning styles on their chemistry achievement, and whether matching between teaching and learning style. *Cognitive therapy and research*, 1, 287-310