

## ***Influence of Learning Style Preferences on the Academic Performance of Secondary School Students in Zaria Metropolis, Kaduna State, Nigeria***

**<sup>1</sup>Busari Akeem**

[abdulhakeembusari@gmail.com](mailto:abdulhakeembusari@gmail.com)

**<sup>1</sup>Prof A. I. Mohammed**

[aishaindo@gmail.com](mailto:aishaindo@gmail.com)

<sup>1</sup>*Department of Educational Psychology and Counselling  
Faculty of Education  
Ahmadu Bello University, Zaria*

### **Abstract**

*This study examined the influence of learning style preferences on the academic performance of secondary school students in Zaria Metropolis, Kaduna State, Nigeria. Two objectives, two research questions and two null hypotheses guided the study. Survey design was used. A sample of 361 students was drawn from Senior Secondary II (SSII). Instrument used for data collection was Learning Style Inventory. The generated data was analyzed using Pearson Product Moment Correlation (r) and ANOVA. The findings show that positive significant relationship exists between auditory learning style and academic performance ( $r=.625, p=.002$ ), and significant difference exists among academic performance mean scores of students using kinaesthetic, visual and auditory learning style preferences ( $f=17.154, p=0.000$ ). From the result of the findings, it was recommended that teachers in secondary schools should develop and encourage other learning styles of their students.*

**Keyword:** Kinaesthetic, Visual, Auditory, Learning, Style, Academic, Performance

### **Introduction**

Academic performance has for the past decades been the centre of interest in educational research. Exploring the issue of performance has extended beyond simple issues of intelligence and prior academic performance to how learners interact with the learning material.

Learning styles, by definition, are learning strategies peculiar to an individual which help that individual to learn well. However, Snowman and Biechler (2003) believed that learning styles are preferences for dealing with intellectual tasks in a particular way. In addition, Dunn and Dunn (2003) defined learning styles as the way in which each person begins to concentrate, process, and remember new and difficult academic content.

There are many types of learning styles today in literature, such as, emotional, environmental, psychological, sociological and physical learning styles but, Rochester Institute of Technology (2011) classified learning styles of adult learners as auditory, visual, kinaesthetic and environmental. Learning is a comparatively perpetual change in a person's awareness or behaviour due to familiarities. The concept of learning includes strengthening correct responses and weakening incorrect responses. Fleming theory is considered to be one of the classical learning theories in the educational field; it is best known as VAKT, implying Visual (V), Auditory (A), Kinaesthetic-Tactile (KT) (Mackay, 2010).

Fleming is best known worldwide for the design of the Visual, Auditory, Kinaesthetic-Tactile (VAKT) model, which expanded upon earlier Neuro-linguistic programming (NLP) models. His Visual, Auditory, Kinaesthetic-Tactile (VAKT) model was launched in 2015 through work done at Lincoln University. Prior to Fleming's work, VAK was in common usage. Fleming split the Visual dimension (the V in VAK) into two parts: symbolic as Visual (V) and text as Read/write (R) (Fleming, 2009). This created a fourth mode, Read/write and brought about the word Visual, Auditory, Kinaesthetic-Tactile (VAKT) for a new concept, a learning-preferences approach, a questionnaire and support materials.

Visual learning style is a learning style in which learners acquire class lessons best by seeing it presented in objects like charts, graphs, pictures and other visual learning tools. Rochester (2011) defined visual learning style as a learning style in which ideas, concepts, data and other information are processed with images and visual techniques. Rochester went further to state that visual learners process information best when it is visually demonstrated or illustrated.

Auditory learning style is a learning style in which a person learns best through listening, sounding out lessons, memorization and other instructions. Coffield, Moseley, Hall and Ecclestone (2004) defined auditory learning style as a process by which individuals learn best via listening to tapes, radios and lectures. They went further to say that auditory learners depend on hearing and speaking as their main way of learning.

Kinaesthetic learning style involves students actually carrying out physical activities, rather than listening to instructor; students with kinaesthetic learning style are commonly known as doers. A kinaesthetic-tactile learning style requires that students manipulate or touch material to learn. Kinaesthetic-tactile can be viewed as one term, but sometimes they are viewed as separate terms. Kinaesthetic-tactile techniques are used in combination with visual and/or auditory study techniques, producing multi-sensory learning (Laskey & Gibson, 1997). It also involves movement and action,

emphasis on doing, direct involvement, demonstrating, showing and so on. Individuals that are kinaesthetic learn best with an active “hands-on” approach. These learners favour interaction with the physical world. Most of the times, kinaesthetic learners have a difficult time staying on target and can become unfocused effortlessly (Bethel-Eke & Eremie, 2017).

Academic performance is the extent to which a student, teacher or institution have achieved their short or long term educational goals. Cumulative Grade Point Average (CGPA) and completion of educational degrees, such as bachelor’s degree, Secondary School Certificate Examination (S.S.C.E), represents academic achievement. This is commonly measured through examinations or continuous assessment. The outcomes of many examinations and continuous assessment have raised concern among parents, guardians, government and teachers. According to Rajshri (2013), factors responsible for or influencing academic performance may include: individual differences in terms of learning styles preferences, cognitive functions like attention, memory and reasoning; self-control which include self-discipline, self-regulation, delay of gratification and impulse-control. There are students who are able to maximize their learning style; there are also students who have not been able to maximize their learning style because they have not realized the learning style they have (Sahabuddin, 2018). According to the sociological elements, individuals’ learning styles differ when learners are either alone or with adults, peers or related combination of those (Karalliyadda, 2017).

### **Statement of the Problem**

One of the things a teacher should consider is the nature of instructions and pupils’/students’ various learning personalities. It is very common that instructions are passed without considering learning styles of pupils/students and that posed a serious challenge to the academic performance of students in schools. There are many students with different learning behaviours and such behaviours are what teachers should give cognizance to for the attainment of credible academic performance. Students’ learning choices vary in the classroom and they are to be given priorities for the attainments of behavioural objectives. Different behaviours are shown in the classroom between teachers and students. It is the good relationship between teachers’ competence, teaching aids and effective rapport with the pupils/students that will enhance learning and academic performance. Therefore, the problem of the study is the academic performance which is influenced by various learning styles. These researchers therefore seek to find out the relationship of Neil Fleming’s learning styles preference with academic performance of secondary school students in Zaria metropolis, Kaduna State.

### **Objectives**

The following objectives are formulated to guide the study:

1. To examine the relationship between visual learning style and academic performance of secondary school students.
2. To investigate the differences among academic performances of students using auditory, visual and kinaesthetic learning styles.

### **Research Questions**

The following research questions guided the study:

1. What is the relationship between visual learning style and academic performance of secondary school students?
2. Are there differences among academic performances of students using auditory, visual and kinaesthetic learning styles?

### **Hypotheses**

The following hypotheses guided the study:

**Ho1:** There is no significant relationship between visual learning style and academic performance of secondary school students.

**Ho2:** There is no significant difference among academic performances of students using auditory, visual and kinaesthetic learning styles?

### **Methodology**

Survey research design was used for this study. This was used for collecting information from large population in natural setting. This design, according to Belue (1995), is a form of descriptive research undertaken when dealing with systematic collection of data or information from a population through the use of personal interview, opinion scale, questionnaire and/or observation. Survey involves an investigation of entire population of people or items under study by collecting data from sample drawn from the population and assuming that these samples are true representation of the entire population. Since the population of this study is large, and samples are to be drawn to represent the entire population, survey method is appropriate to that effect.

The population of this study is made up of all senior secondary II (SSII) students of public senior secondary schools in Zaria Metropolis, Kaduna State. There were thirty-one (31) public senior secondary schools in Zaria Metropolis with six thousand, seven hundred and seventy two (6,772) males and females senior secondary II students (SSII). However, ten (10) schools were selected from the thirty-one (31) schools using simple random sampling technique of balloting method; while proportionate sampling technique was used to select three hundred and sixty-one (361) students from the ten (10) schools by simple percentage since the number of students in each school varies.

The sample for this study is 361 students of public senior secondary II (SSII) in Zaria metropolis. The sample selection was guided by Krejcie and Morgan (1970).

Academic performance tests in mathematics and English language were adapted and were used for this study. Learning style inventory was adapted from Andrew (2013). The instrument measured each individual's learning style. They include kinaesthetic, visual and auditory learning styles. Kinaesthetic learning style measured how students learn in situation through movement of the body, hands on objects, trying things out, use hands to describe what they learnt. Auditory learning style measures how pupils/students prefer to be learning using audio materials, prefer to sound out words, prefer to only listen; visual learning style measures how pupils prefer to learn using visual images and prefer diagram and picture for aiding understanding of concepts. The instrument has 30 items with five (5) points likert scale ranging from Strongly Agreed (SA), Agreed (A), Not Sure (NS), Disagreed (D) and Strongly Disagreed (SD).

The data collected was analyzed using descriptive and inferential statistics. The descriptive statistics of mean and standard deviation were used to answer research questions; while the inferential statistics was used to test the hypotheses. Pearson product moment correlation ( $r$ ) was used to test hypothesis 1 while ANOVA was used in testing hypothesis 2. All hypotheses were tested at 0.05 alpha level of significance.

### **Presentation of results**

**Ho1:** There is no significant relationship between Visual Learning style and Academic performance among secondary school students.

**Table 1:** Pearson Product Moment correlation coefficient ( $r$ ) on the relationship between Visual Learning style and academic performance of secondary school students

<b>Variables</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>df</b>	<b>r</b>	<b>p</b>
Visual Learning Style	190	40.40	10.48	188	0.792**	0.010
Academic performance		39.64	13.31			

\*\* . Correlation is significant at the 0.05 level (2-tailed).  $P < 0.05$

Results of the Pearson Product Moment Correlation ( $r$ ) statistic revealed that strong, positive and significant relationship exists between Visual Learning style and Academic performance of secondary school students ( $r=0.792$ ,  $p= 0.010$ ). The one

hundred and ninety (190) sample is the number of students who adopted visual learning styles which was observed from the responses given on the instrument. This shows that the higher and efficient the Visual Learning style is, the higher Academic performance of students and vice versa. This implies that the relationship between Visual Learning style and Academic performance of secondary school students is directly proportional. Therefore the null hypothesis which states that there is no significant relationship between Visual Learning style and academic performances of secondary school students, is hereby rejected.

**Ho2:** There is no significant difference among the academic performance mean scores of students using visual, auditory and kinaesthetic learning styles.

**Table 2:** Descriptive Statistics on the difference of the mean scores among the three learning styles

	<b>N</b>	<b>Mean</b>	<b>SD</b>
Auditory	134	47.30	10.18
Visual	190	41.88	8.82
Kinaesthetic	37	39.16	10.70
Total	361	43.61	9.96

Table 2 shows the academic performance mean scores and standard deviation of the three learning styles. From the mean scores, differences were observed among the learning styles which show that students preferred auditory learning style to others. Also from table 2, the mean score of auditory learning style is 47.30 while kinaesthetic learning style is 39.16. The difference between the two learning style is 8.14. This implies that auditory learners performed better than kinaesthetic learners. Also, the mean score of visual learning style is 41.88 while the mean score of kinaesthetic learning style is 39.16. The difference between the two styles is 0.28. This shows that their performances are almost equal.

**Table 3:** Summary of ANOVA table for the analysis presentation of the academic performance means scores of the learning styles

	<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>f</b>	<b>Sig.</b>
Between Groups	3126.357	2	1563.179		
Within Groups	32623.122	358	91.126	17.154	.000
Total	35749.479	360			

Table 3 shows the results of the Analysis of Variance statistics, indicating that significant differences exist in the performance of students using Auditory, Visual and Kinaesthetic learning styles. Reasons being that the computed p-value of 0.000 is lower than the 0.05 alpha level of significance, and the computed F value of 17.154 is higher than the F critical value of 3.000. Therefore, the null hypothesis is hereby rejected.

**Table 4:** Scheffe’s post hoc method of analysis of difference in mean scores among the learning styles

<b>learning style groups</b>	<b>(J) learning style groups</b>	<b>Mean Difference (I-J)</b>	<b>Std. Error</b>	<b>Sig.</b>
Auditory	Visual	5.42066*	1.07687	.000
	Kinaesthetic	8.14008*	1.77283	.000
Visual	Auditory	5.42066*	1.07687	.000
	Kinaesthetic	2.71942	1.71536	.286
Kinaesthetic	Auditory	8.14008*	1.77283	.000
	Visual	2.71942	1.71536	.286

Table 4 shows the multiple comparisons between the mean scores of learning styles. Significant difference exists between auditory and visual learning style in their mean scores with  $p=.000$ . From tables 2 and 4, the mean score of auditory learning style is 47.30 while mean score for visual learning style is 41.88. The difference between the two learning styles is 5.42 this implies that auditory learners performed better than visual learners.

### **Summary of Findings**

The following are the summaries of major findings:

1. Positive significant relationship exists between visual learning style and academic performance of secondary school students.
2. Significant differences exist among academic performances of students using auditory, visual and kinaesthetic learning styles; and auditory learning style students do better than other students.

### **Discussion of the findings**

The present research examined the influence of learning styles on academic performance of secondary school students in Zaria metropolis of Kaduna State, Nigeria. One of the findings of the study shows that positive relationship exists between visual learning style and academic performance of secondary school students in Zaria Metropolis. This shows that the use of visual learning material improves academic performance. This study affirms the findings of Sahabuddin (2018) who reported that there existed positive relationship between visual learning style and academic performance on learning entrepreneurship. Sahabuddin (2018) maintained that individuals' visual learning style potential should be unleashed because 71% performance of students revolves around visual learning and teaching.

Another finding of this study indicated that significant difference exists in the academic performance of students with kinaesthetic, visual and auditory learning style. This finding supported the findings of Karalliyadda (2017) who revealed that substantial differences existed between the learning styles – kinaesthetic, auditory and visual. It was maintained that availability of multimodal learning styles are suitable to use blended teaching aids such as lectures, videos and illustrations as well as to encourage students to take self-notes etc. Karalliyadda (2017) also suggested that this study can be performed using aid to understand the learning style in different angles.

### **Conclusion**

Based on the findings, it was concluded that significant relationship existed between visual learning styles and academic performance. It was also concluded that auditory learning style influence academic performance. However, the findings of the study revealed that significant difference existed among the three learning styles, with kinaesthetic learning styles being the dominant learning style of students.

### **Recommendations**

The following recommendations are given on the bases of the findings of the study:

1. Since there is a positive relationship between visual learning style and academic performance, teachers should encourage, promote and dominate their class



lessons/lectures with the availability of visual learning tools. This will motivate other students who do not learn best using visual materials.

2. Modern teaching and learning aids should centre on all learning styles of students: Kinaesthetic, Visual and Auditory.

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