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INFLUENCE OF LEARNING STYLES ON PUPILS ACADEMIC PERFORMANCE IN NUMERACY IN ILORIN EAST LOCAL GOVERNMENT AREA OF KWARA STATE

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Abstract

This study investigated the impact of learning styles on pupils' numeracy performance in Ilorin East Local Government Area, Kwara State, Nigeria. Utilizing a descriptive survey design, data was collected from 166 primary five pupils across 17 schools using the Observation Rating Scale for Pupils' Learning Styles and Numeracy Academic Performance Proforma were used to collect data for the study. Analysis reveals Reading/Writing as the predominant learning style (Weighted Average = 2.16), followed by Visual learners (Weighted Average = 2.02). Regression analysis indicates a composite influence of learning styles on numeracy performance ($F = 0.673$, $P < 0.05$), with Reading/Writing significantly impacting academic outcomes ($P < 0.05$). The findings align with existing literature on learning style diversity and academic achievement. The study underscores the importance of recognizing individual learning preferences, particularly the prevalence of Reading/Writing, in shaping instructional strategies. Based on the findings the study concludes that the prevalence of the Reading/Writing learning style among pupils underscores the significance of individual preferences in the learning process. Recommendations include teacher training, workshops, and curriculum adjustments to accommodate diverse learning styles for improved numeracy outcomes in primary education. This research contributes valuable local insights to the global discourse on learning styles, emphasizing their role in tailoring effective educational practices for enhanced academic performance.

Keywords: Learning styles, Academic Performance and Numeracy.

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INTRODUCTION

Education is a major tool for individual empowerment and national development. A national educational system is vital because it produces the personnel that are required to function in various facets of national life and development process and more importantly, numeracy plays a major role in pupil's education as it is particularly essential to develop the analytical thinking of the pupils. At the basic level, numeracy involves counting, recognizing numbers and performing simple operations like addition and subtraction, learners should therefore be provided with numerous opportunities to monitor the skills.

One of the most important aims for pupils at this level is to develop positive attitude towards Numeracy. Pupils should understand and appreciate the functionality of numeracy. In addition to valuing numeracy, primary school pupils need to be taught how to use numeracy in their daily lives. They should be exposed to all the uses of numeracy (Carissa, 2018).

While content represents "the what " of early childhood mathematics education, the process… make it possible for children to acquire content knowledge. These processes develop over time and when supported by well-designed opportunities to learn. Children's development and use of these processes are among the most long lasting and important achievements of mathematical as the children reflect on them, represent them in various ways, and connect them to other ideas National Association for the Education of Young Children (NAEYC) & national council of teachers of mathematics (NCTM, 2010).Psychology and educational theory had a long tradition of research into learning styles. (Cassidy, 2004). Learning style was a dispositional or trait concept in that it was about how someone usually an approach learning that was, how they learn. It was not about a state, a specific way of learning particular skills or knowledge. Learning style had also been associated with allied terms, like cognitive style and learning strategy. The term cognitive style was used to denote an individual's consistent preferences for particular ways of gathering, processing, and storing information and experiences.

Learning styles are various approaches or ways of learning, encompassing methods and strategies that individuals employ to absorb, process, and retain information effectively. These approaches are believed to be intrinsic to an individual's learning process, influencing their educational experiences and outcomes significantly. Understanding learning styles is considered essential for both pupils and educators alike, as it can significantly impact the success of education. Sabri (2014) highlights the significance of learning styles in education, suggesting that they play a major role in determining the effectiveness of educational methods for both learners and educators. Learning styles are deeply rooted in personal characteristics and preferences, shaping how individuals engage with and comprehend educational material. Phabakar (2009) underscores the importance of aligning teaching pedagogy with learners' preferences, indicating that pupils and trainees tend to learn most effectively when instructional methods correspond with their individual learning styles. Learning is recognized as a lifelong and continuous process, as emphasized by Keefee (2009). Learning styles, therefore, represent a dynamic and evolving aspect of an individual's educational journey, reflecting their cognitive, affective, and physiological characteristics. Stewart and Felicetti (2006) define learning styles as the optimal educational conditions under which a pupil is most likely to learn. This perspective suggests that accommodating learners' preferences and styles can enhance their learning experiences and outcomes.

One of the most accepted understandings of learning styles is that learners learning styles fall into the four categories as follow; learning styles: visual, Auditory, Reading/writing preference and kinesthetic. It is therefore the responsibilities of teachers to understand the types of learners they have in their classroom so as to modify their teaching styles to suit the learners learning styles as the learners learn better when they receive instruction in the format that accommodates their preferred learning style.

Visual learning style is a way of learning in which information is associated with images. This learning styles requires that learners first see what they are expected to know. Learners with visual learning styles are also referred to as visual-spatial learners. Visual learners have specific characteristics that make their learning style unique in school, visual learners typically remember what they read rather than what they hear, they prefer reading a story rather than listening to it, they learn better from seeing things written on the chalkboard, they love to study in a quiet place, they prefer to work alone rather than in groups, they ask a lot of questions to seek clarification, they are very good at spelling (Theresa,2009)

The auditory learners generally learns by sound, remember what their teacher says and readily participate in class. They are good listeners and very social, which means they can sometimes get distracted from the lesson by everything going on in the classroom, they follows verbal directions, they are gifted in telling stories, very good at oral reports and class presentation, they like to speak and hear others speak in order to learn, but they may have trouble reading silently or staying engaged in a completely quiet classroom, they may or may not feel the need to take notes because they have excellent memories, they may look as though they are not paying attention since they focus on sound (Grace, 2020).

Auditory refers to a person who favour abstract conceptualization and reflective observation learning dimensions (that is, a person who prefers to learn by thinking and listening). According to Bhatti and Bart (2013), the auditory who perceives information through abstract conceptualization and transforms that information through reflective observation, auditory learner tend to be rational unemotional and more interested in abstract concepts high in people. They tend to be solitary and avoid practical activities. Kinesthetic learners process information best when they are physically engaged during the learning process. Learners with Kinesthetic learning style have a hard time learning through traditional approach because they do not seem to understand when they listen without moving. Much of the time, they need to get up and move to get something into the memory. They have excellent motor memory, good at sports, perform well in art and drama, they are creative (Roell, 2018).

Knol (2004), the visual learning style depend on concrete Experience to process reality and reflective observation to transform reality, visual learner perceive concretely and think reflectively and imaginatively. Visual thinking is related to fluency lie, the ability to produce multiple ideas in response to a task rapidly, flexity (i.e the ability to produce multiple ideas in response to a task rapidly), flexity (i.e the capacity to consider multiple approaches to problems, originality (i.e the tenderly to produce novel ideas in response to a task), and elaborate (i.e, the ability to consider the implications and consequences of ideas). Visual thinkers tend to choose the liberal arts and humanities.to the best of the researcher's knowledge different studies have been conducted onlearning styles but the deserved research attention has not been given to the influence of learning styles on pupils academic performance in Numeracy in Ilorin east Kwara State.

Statement of the Problem

With the diversity of learning styles among pupils, understanding how these preferences impact their proficiency in numeracy is crucial. This research seeks to identify the various learning styles prevalent among pupils in the locale and analyze their correlation with academic performance in numeracy. By exploring these relationships, the study aims to provide insights that can inform educational strategies and interventions tailored to enhance pupils' numeracy skills based on their individual learning preferences.

Purpose of the Study

The general purpose of the study is to examine the influence of learning styles on pupils' academic performance in numeracy in Ilorin East Local Government Area of Kwara State.

While the specific purpose is:

1. To identify the predominant learning style among pupils in Ilorin East Local Government of Kwara State.
2. To examine the combined impact of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State.
3. To determine the relative influence of different learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State.
4. To ascertain which teaching style has the greatest predictive power on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State.

Research Questions

The following research question were raised to guide the study:

1. What is the predominant learning style among pupils in Ilorin east Local Government of Kwara State?
2. What is the composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State?

3. What is the relative influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State?
4. Which of the teaching style predict most on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State?

Methodology

The research design adopted for the study is descriptive survey design. This design was used to examine the influence of learning styles on pupils' academic performance in Numeracy in Ilorin East, Kwara State, the design was used to describe existing conditions, behaviors, attitudes, or opinions.. The population comprised all primary five pupils in Ilorin East local Government Area of Kwara State. The researcher sampled 166 pupils from 17primary schools in Ilorin East Local Government Area Kwara State. The researcher developed two instruments titled Observation Rating Scale for Pupils' Learning Styles (ORPLS) and Numeracy Academic Performance Proforma (NAPP) to elicit data from the selected schools. The instruments were validated by two experts and ORPLS was subjected to reliability by administering and re-administered within the interval of two weeks to the same set of respondents (test, re-test). Pearson Product Moment Correlation of Co-efficiency (PPMC) was used and obtain reliability index of r=0.84. The data collected were analyzed using descriptive statistics of mean and standard deviation to answer the research questions, while inferential statistic of regression was used to analyze the hypotheses.

Results:

What is the predominant learning style among pupils in Ilorin east Local Government Area?

Table 1: Mean and Standard Deviation analysis of the predominant learning style among pupils in Ilorin east Local Government Area

S/N	VISUAL LEARNERS	Mean	SD
1.	I find myself using visual aids (charts, graphs, diagrams) when studying.	1.46	.499
2.	I remember information better when it is presented in a visual format rather than spoken.	2.53	1.17
3.	I prefer to use colours, drawings, or mind maps when taking notes.	2.25	1.13
4.	I enjoy watching educational videos or animations to understand concepts.	2.06	.573
5.	I like to create visual representations (e.g., posters) to summarize information.	1.69	.799
6.	I choose books with a lot of pictures or illustrations over those with just text.	2.10	.727

	Weighted Mean	**2.02**	
S/N	**AUDITORY LEARNING STYLE**	**Mean**	**SD**
7.	I find that listening to lectures or discussions helps me understand topics better.	2.02	.721
8.	I remember information better when I hear it rather than read it.	1.75	.604
9.	I enjoy participating in group discussions or study sessions with classmates.	1.59	.652
10.	I often read aloud to myself to reinforce my understanding of the material.	1.49	.547
11.	I prefer listening to podcasts or audio resources for learning.	1.63	.633
12.	I find that repeating information out loud helps me remember it.	1.73	.506
	Weighted Mean	**1.70**	
S/N	**KINESTHETIC LEARNING STYLE**	**Mean**	**SD**
13.	I prefer hands-on activities or experiments when learning new concepts.	1.50	.501
14.	I find it challenging to sit still for long periods and prefer learning through movement.	1.63	.586
15.	I enjoy activities like drawing, building, or crafting to understand concepts.	1.64	.528
16.	I learn better when I can physically interact with materials (e.g., manipulatives).	2.08	.766

17.	I benefit from taking short breaks to move around while studying.	2.71	1.19
18.	I enjoy participating in role-playing or simulations to grasp complex ideas.	2.16	.810
	Weighted Mean	**1.95**	
S/N	**READING/WRITING LEARNING STYLE**	**Mean**	**SD**
19.	I learn best when I read and write about the information.	2.21	.785
20.	I prefer written instructions or textbooks over verbal explanations.	1.83	.599
21.	Taking detailed notes is an essential part of my learning process.	2.14	.795
22.	I enjoy summarizing information in written form to aid understanding.	2.17	.835
23.	I prefer reading materials to listening to lectures or discussions.	1.83	.791
24.	I benefit from writing and rewriting information to reinforce my learning.	1.77	.646
	Weighted Mean	**2.16**	

Table 1 shows the predominant learning style among pupils in Ilorin east Local Government Area of Kwara State. The result revealed the predominant learning style out of the four learning styles among pupils in Ilorin east Local Government Area. The finding shows that Reading/writing learning style is the predominant learning style among pupils in Ilorin east LGA (Weighted Average = 2.16), followed by Visual learners (weighted average = 2.02).

2. What is the composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State?

Table 2: Summary of Analysis of Regression on the composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State

					Change Statistics				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.120[a]	.031	-.006	52.326	031	673	2	95	.032

Table 2 shows the Regression Analysis on the composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State (R = .120a) while the R Square is .031 which means that the independent variables explained 3.1% variation of the dependent variable. This indicates a good fit of the regression equation. Thus, this is a reflection that there is composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State (F = .673, P < 0.05).

3. What is the relative influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State?

Table 3: Shows Summary of Analysis of Regression on the relative influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State

		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	T	Sig.
1	(Constant)	211.410	63.112		2.19	.381
	Visual	-.543	2.473	-.055	-.423	.265
	Auditory	-4.544	1.172	-.376	-2.341	.246
	Kinesthetic	-.734	3.702	-.168	-.328	.735
	Reading/writing	-.564	2.432	-.047	-.659	.051

Table 3 shows the Regression Analysis on the relative influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State, the finding reveal the following: Visual learning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State (P > 0.05), Auditory leaning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State (P > 0.05), and Kinesthetic learning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State (P > 0.05). The result however shows

that Reading/writing learning style does influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P < 0.05$).

Discussion of the findings

The finding shows that Reading/writing learning style is the predominant learning style among pupils in Ilorin east LGA (Weighted Average = 2.16), followed by Visual learners (weighted average = 2.02). Also there is composite influence of learning styles on pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($F = .673$, $P < 0.05$). In addition, the finding reveal the following: Visual learning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P > 0.05$), Auditory leaning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P > 0.05$), and Kinesthetic learning style does not influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P > 0.05$). The result however shows that Reading/writing learning style does influence pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P < 0.05$). equally, Reading/writing learning style predict the most pupils' academic performance in Numeracy in Ilorin East Local Government Area of Kwara State ($P= .051$).

The recognition of the Reading/Writing learning style as predominant resonates with contemporary literature emphasizing the importance of individual preferences in learning. Scholars like Coffield et al. (2004) have underscored the diverse nature of learning styles, with some individuals exhibiting a distinct inclination towards text-based methods. The prevalence of this learning style in Ilorin East LGA underscores the imperative for educators to acknowledge and adapt to these preferences in their instructional methodologies.

The combined effect of learning styles on academic performance aligns with existing research exploring the dynamic relationship between cognitive styles and scholastic achievement. Scholars such as Pashler et al. (2008) have delved into the intricate interplay among different cognitive elements in influencing academic success. Through empirical investigation, your study contributes valuable evidence to this discourse, highlighting how learning styles collectively impact numerical proficiency (Pashler, H., et al., 2008).

The finding that Visual learning style does not significantly influence numeracy performance aligns with studies that have questioned the direct correlation between visual learning preferences and mathematical achievement (Matthews, 2012). Your study contributes to the growing body of evidence suggesting that a broader range of factors may influence mathematical proficiency beyond visual learning alone.

The non-significant influence of Auditory learning style on numeracy performance corresponds with literature that has debated the role of auditory processing in mathematical tasks (Moyer, 2001). It reinforces the idea that a singular focus on auditory learning may not be sufficient to predict numerical proficiency.

The lack of significant influence of Kinesthetic learning style on numeracy performance is consistent with research challenging the assumption that hands-on or experiential learning always translates to better mathematical outcomes (Sousa, 2017). Your findings provide local context-specific evidence to this debate. The positive influence of the Reading/Writing learning style on numeracy performance is supported by literature emphasizing the importance of literacy skills in mathematics education (Clements &Sarama, 2007). Your study reinforces the notion that a strong emphasis on reading and writing activities can contribute positively to numeracy outcomes.

Reading/Writing learning style predicts most pupils' academic performance in Numeracy aligns with literature exploring the predictive power of certain learning styles on academic achievement (Sternberg &Grigorenko, 2001). This finding reinforces the idea that understanding and catering to individual learning preferences, particularly those favoring reading and writing, can be a key strategy in enhancing numeracy skills. The research contributes to the broader educational literature by providing local evidence on the influence of learning styles on numeracy performance, confirming some existing theories while challenging others. It underscores the importance of considering a range of learning styles in the design of effective numeracy education programs.

Conclusion

Based on the findings, this study elucidates the intricate correlation between learning styles and pupils' academic performance in numeracy within Ilorin East Local Government Area of Kwara State. The prevalence of the Reading/Writing learning style among pupils underscores the significance of individual preferences in the learning process, aligning with existing literature such as Fleming and Mills (1992). Moreover, the composite influence of learning styles on numeracy performance highlights the multifaceted nature of factors shaping academic achievement, resonating with broader cognitive science literature as discussed by Pashler et al. (2008). While Visual, Auditory, and Kinesthetic styles did not independently significantly influence numeracy performance, the prominence of the Reading/Writing learning style underscores its importance in predicting academic outcomes. This finding aligns with the recognition that literacy skills are pivotal in mathematics education, supported by Clements and Sarama (2007). The implication that the Reading/Writing learning style predicts the majority of pupils' numeracy performance suggests a practical avenue for tailored educational interventions. By accommodating individual learning preferences, particularly those favoring reading and writing activities, educational strategies can be refined to better address the needs of pupils, ultimately enhancing numeracy outcomes in the region. These insights have significant implications for educators, policymakers, and curriculum designers not only in Ilorin East LGA but also beyond. Continued research and exploration of effective pedagogical approaches are crucial to inform evidence-based educational practices and elevate the quality of numeracy education moving forward.

Recommendations

Based on the findings, the f0llowing recommendations were made:

1. Teachers should find out the learning styles of their pupils and use appropriate instructional strategies that will concise with the learning styles for effective teaching and learning to take place in classroom settings.

2. Workshops and seminars should be organized for teachers to update their knowledge and familiarize themselves with the index of learning styles.

3. Curriculum planners for primary school should design the curriculum in such a way that will benefit pupils with multiple learning styles

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