



RESEARCH ARTICLE

Effect of School Location on the Adopted Cognitive Style of Primary School Students in Kogi State

Sunday Aboritolli

Department of Integrated Science Kogi State College of Education, Ankpa.

Manuscript Info

Manuscript History

Received: 31 August 2021

Final Accepted: 30 September 2021

Published: October 2021

Key words:-

Cognitive Style, Field Independent,
Field Dependent, School Location

Abstract

Primary education is globally recognized as the foundation laying stage of education. Over the past few decades, researchers have devoted interest to the differences in reasoning, problem-solving, and perception that underlie cognitive style. Numerous researchers have also attributed the differences in cognitive style to various social, cultural, psychological, and demographic factors. However, the purpose of the present study is to examine school location as an environmental factor that could predict children's cognitive styles. Sixty-four primary school students drawn from primary schools in rural and urban communities in the Kogi state participated in the study. The Group Embedded Figure Test (GEFT) was used for data collection. The result of the study revealed that the school location significantly predicted field independent/dependent cognitive style. Thus, the study concluded that the school environment is a positive determinant of adopted cognitive style.

Copy Right, IJAR, 2021, All rights reserved.

Introduction:-

Education is one of the veritable and effective instruments for change and transformation in every nation's socio-political, scientific, and technological spheres (Awhen et al., 2014). In Nigeria, primary education is an essential component to realizing personal and national development (Enaigbe, 2010; Obiweleuzor et al., 2013). Primary education in Nigeria has undertaken tremendous and positive changes in both contents and approaches over the years. Etor et al. (2013) and Ugwoke (2018) noted that primary education is generally accepted as the foundation laying level of education across the universe. The government of Nigeria, including other developing nations, has at different times made frantic efforts in growing the number of children enrolled in primary schools (Julianna & Clinton, 2012).

The governments, including the states and local governments and the private sectors, have constituted prominent actors in Nigeria primary education system through the instrumentality of the Universal Basic Education Commission (UBEC), State Universal Basic Education Board (SUBEB), and Local Government Education Authority (LGEA) (Odewale, 2019). However, the government has made significant efforts to improve primary education management, including content development, educational facilities and infrastructure upgrade, teachers training, and more. Perhaps, Primary education is a crucial stage in the education process, being the foundation for other steps. Research has widely emphasized the significance of primary education to national development (Anero, 2018; Benavot, 2014; Mathooko, 2009; Programme, 2019; Roseline & Matthew, 2020; Sadruddin, 2013; Shohel & Howes, 2011; Ssewamala et al., 2011; Suleiman et al., 2017; Zhou, 2020). Although the present study is not looking

Corresponding Author:- Sunday Aboritolli

Address:- Department of Integrated Science Kogi State College of Education, Ankpa.

at the importance of primary education, it is essential to highlight its relevance while assessing the contributory role of school location of the pupil's cognitive pattern

Over the years, research has provided empirical evidence suggesting that people have a habitual way of attending to tasks and situations in their environment relating to a particular style in cognitive processes (Arifin et al., 2020; Gamboa Mora et al., 2021; Koć-Januchta et al., 2019; Saha & Sharma, 2020). These cognitive processes include attention, decision-making, problem-solving, and perception (Bendall et al., 2016). Cognitive style is conceptualized as one's usual or customary reasoning, remembering, perceptual pattern, and problem-solving approach. Earlier research in cognitive psychology has shown that individuals parade significant individual differences in the mental processing pattern they adopt in problem-solving (Robertson, 1985).

The construct of cognitive styles describes the many ways people consistently vary in their cognitive dimensions in association with constant inter-individual differences in response to stimulus (Boogert et al., 2018; Carere & Locurto, 2011; Griffin et al., 2015; Sih & Del Giudice, 2012). Accordingly, Brown et al. (2006) defined cognitive styles as a psychological construct relating to personal information processing strategies. More so, Amazue (2007) explained the construct of cognitive style as the characteristics of a self-consistent model of functioning found pervasively throughout an individual's perceptual and intellectual activities. Thus, the Cognitive style represents the stable style by which an individual observes, assesses, and reacts to a situation. Tang (2009) noted that cognitive style is considered an essential component of learning style that has significant contributions to language acquisition. For Marai (2007), the concept of cognitive style represents the heuristics that individuals use to process information about their environment.

Researches on cognitive styles indicate a positive correlation between cognitive styles and teaching (Kyalová & Vasilyeva, 2015). For instance, Son et al. (2020) found an interactional effect between teaching models and students' cognitive styles. Thus, indicating that the variations in cognitive patterns contribute to student learning. Researchers have studied many cognitive styles, including field-independent and field-dependent cognitive style, analytic and global cognitive style, reflective and impulsive cognitive style, and tolerance and intolerance of cognitive ambiguity style (Altun & Cakan, 2006; Davies & Graff, 2006; Di Sabato et al., 2013; Ford et al., 2002; Mefoh et al., 2017; Ramli et al., 2019; Rosita, 2018; Threadgill, 2020; Witkin et al., 1977).

However, the present study is concerned with field-independent/dependent cognitive style. The concept field dependence-field independence cognitive style theory was first proposed by Herman Witkin (Witkin et al., 1977). The theory contends that the existing perceptual environment significantly shapes an individual's cognitive processes. Thus, the theory classified individuals who perceive situations as embedded in the background as field-dependent. On the other hand, people who observe things as separate from the surrounding environment are field-independent. Field-dependence/independence cognitive style is conceptualized as part of a characteristic of individual differences in processing and organization of social or cognitive information. A recent study (Sutama et al., 2021) noted that individuals with a field-dependent cognitive style adopt a pattern as a whole, thus, finding it difficult to elaborate a perceptual outcome. In contrast, field-independent individuals think more diversely and are more independent in perceptual processes.

Field-dependent/independent cognitive style in the context of this study denotes the variation in perceptual processes of primary school students. Research in education has led to considering the influence of field-dependent/independent cognitive style on academic achievement and various learning behaviors (Atsuwe & Mtoh, 2019; Becerra-Bulla et al., 2019; Guisande et al., 2007; Hayati et al., 2020; Nicolaou & Xistouri, 2011; Onyekuru, 2015; Probosiwi et al., 2019; Sutrisno et al., 2020; Thomson et al., 2015; Vargas et al., 2012; Zhdanovich, 2021). Research in this path provides insight into the significance of cognitive style on student's learning. Thus, the present study explored cognitive style in association with its reliability in predicting academic achievement.

Evidence suggests that the school environment is an essential factor in students' cognitive style (Russo et al., 2001). However, research investigating the relationship between school setting and cognitive style remains scarce in the Nigerian context, hence, the justification for the current study. School location in this study refers to the environmental condition around a school, which could be urban or rural. The school's site is crucial to students' performance, thus, depicting the differences in cognitive patterns. Individual differences in cognitive style emerge earlier in life, and children reared in a creative culture can create their knowledge through experience and cultural tools. Cultural values and beliefs are embedded in children's thought processes, thereby shaping their cognitive

styles. Reference groups, family members and relatives, neighbors, friends, and peer mates with whom children compare themselves and serve as models are essential in comparing cognitive style.

The type and quality of education in a community are essential in shaping a learner's pattern of reasoning. A healthy education is determined by the availability of stimulating materials such as libraries, information communication technology, and quality teachers. The limited access of students in rural communities to quality education may limit their cognitive development. Previous studies have implicated rural and urban influence on student's cognitive style (Khanal, 2016; Rawandale et al., 2020). Therefore, the primary purpose of the present study is to investigate school location (urban and rural) as a scarcely explored variable that could contribute to the adopted cognitive style of the primary school pupils in Kogi State, Nigeria.

Hypothesis

Based on the study's objective, it is hypothesized that school location (urban/rural) will significantly predict the cognitive style of primary school pupils in Kogi State.

Method:-

The design of the study is correlational. The study population constitutes primary school students drawn from public and private primary schools within the urban and rural communities of Kogi State of Nigeria.

Instruments

The Group Embedded Figure Test (GEFT) initially developed by Witkin et al. (1971) was used in data collection. The instrument was subjected to a pilot study for validation, and a Cronbach alpha 0.78 was obtained.

Procedure

The researchers sought permission from the heads of the selected primary schools. The study was conducted during the break period. A simple random sampling technique was used to draw the participant to allow full and equal participation of students. The students were exposed to the GEFT following the ethical enlightenment. They were given instructions in vernacular to benefit the students who may not understand the instructions before the instrument was administered to them by the research assistants. In all, seventy-two primary school pupils were selected for the study. However, sixty-four instruments were adequately filled and used for the analysis.

Result:-

To test the study's hypothesis, which states that school location will significantly predict the adopted cognitive style of the participants. The result of the simple linear regression conducted on the data indicates that the study's assumption was found to be confirmed at $\beta = .944$, $p < .05$, with R^2 of .891. The result demonstrates that school location contributes significantly to the variations in the adopted cognitive styles between the rural and the urban pupils in Kogi State.

Table 1:- Table Showing the simple linear regression analysis for the predictive effect of school location on the adopted cognitive style of primary school pupils.

	B	Std. Error	β	t	Sig.
(Constant)	-1.89	.085		-22.36	.000
S L	.94	.033	.944	29.07	.000
R^2	89.1				

a. Dependent Variable: Cognitive style. * $p < .000$. S L= School Location.

Discussion:-

The current study aimed to examine the variations in the adopted cognitive styles of primary school pupils based on their school location (rural/urban). A simple linear regression was conducted on the data to test the assumption that school location would significantly account for the variance in the adopted cognitive styles of the pupils at $\beta = .944$, $p < .05$, with the adjusted R^2 indicating that the independent variable contributed 89.1 % of the variance in the adopted cognitive styles of the pupils. Thus, the assumption of the study is affirmed. The research result supports the

findings of previous studies (Khanal, 2016; Rawandale et al., 2020), which suggests that the pupils' field-dependent/independent cognitive styles are contingent upon the socio-cultural environment of the pupils. In other words, the physical environment might stimulate particular habitual approaches to information processing. Thus, the variation in cognition that underlies cognitive styles is likely to be altered when the physical or socio-cultural environment itself changes in fundamental ways. The result of the study corroborates the previous study by Amazue (2007), which found that the socio-cultural environment significantly shapes an individual's field-dependent/independent cognitive style. Similarly, de Frias and Schaie (2001) contended that perceived work environment predicted cognitive style. Hence, school location underlies the social environment, which significantly affects cognitive style.

Conclusion:-

The study was conducted to ascertain the role of school location on cognitive style. As expected, the result of the study demonstrated that school location (i.e., urban/rural location) predicted the respondent's cognitive style. Because of the outcome, it is concluded that the school location significantly determines the cognitive pattern. Despite this revelation, the study is challenged with some limitations; firstly, caution should be applied in generalizing the result due to the sampling method and the study's inability to establish cause-effect. However, future researchers should continue exploring factors capable of influencing cognitive style and expanding the scope to understand cognitive styles fully.

References:-

1. Altun, A., & Cakan, M. (2006). Undergraduate students' academic achievement, field-dependent/independent cognitive styles, and attitude toward computers. *Educational Technology and Society*, 9(1).
2. Anero, N. (2018). Relevance and challenges of primary education to the overall development of the child and the Nigerian society. *Global Journal of Educational Research*, 13(2). <https://doi.org/10.4314/gjedr.v13i2.1>
3. Arifin, S., Setyosari, P., Sa'dijah, C., & Kuswandi, D. (2020). The effect of problem-based learning by cognitive style on critical thinking skills and students' retention. *Journal of Technology and Science Education*, 10(2). <https://doi.org/10.3926/JOTSE.790>
4. Atsuwe, B. A., & Mtoh, T. T. (2019). Effect of Cognitive Style on Students Achievement and Retention in Physics in Senior Secondary School in Gwer-West Local Government Area, Benue State, Nigeria. *International Journal of Advanced Research and Innovation*, 7(2).
5. Awhen, F., Timipre, F., & Agyngwuye, J. (2014). Improving the standard and quality of primary education in Nigeria for national development. *Ijrre*, 1.
6. Becerra-Bulla, F., Vargas-Zarate, M., & Trujillo-Oyola, L. (2019). Field dependence-independence cognitive styles in university professors of human nutrition in bogotá d.C., colombia. 2016. *Revista Facultad de Medicina*, 67(3). <https://doi.org/10.15446/revfacmed.v67n3.68277>
7. Benavot, A. (2014). Education for Sustainable Development in Primary and Secondary Education. University at Albany State University of New York, October.
8. Bendall, R. C. A., Galpin, A., Marrow, L. P., & Cassidy, S. (2016). Cognitive style: Time to experiment. In *Frontiers in Psychology* (Vol. 7, Issue NOV). <https://doi.org/10.3389/fpsyg.2016.01786>
9. Boogert, N. J., Madden, J. R., Morand-Ferron, J., & Thornton, A. (2018). Measuring and understanding individual differences in cognition. In *Philosophical Transactions of the Royal Society B: Biological Sciences* (Vol. 373, Issue 1756). <https://doi.org/10.1098/rstb.2017.0280>
10. Brown, E., Brailsford, T., Fisher, T., Moore, A., & Ashman, H. (2006). Reappraising cognitive styles in adaptive web applications. *Proceedings of the 15th International Conference on World Wide Web*. <https://doi.org/10.1145/1135777.1135827>
11. Carere, C., & Locurto, C. (2011). Interaction between animal personality and animal cognition. *Current Zoology*, 57(4). <https://doi.org/10.1093/czoolo/57.4.491>
12. Davies, J., & Graff, M. (2006). Wholist-analytic cognitive style: A matter of reflection. *Personality and Individual Differences*, 41(6). <https://doi.org/10.1016/j.paid.2005.09.011>
13. de Frias, C. M., & Schaie, K. W. (2001). Perceived work environment and cognitive style. *Experimental Aging Research*, 27(1). <https://doi.org/10.1080/036107301750046142>
14. Di Sabato, F., Buonfiglio, M., & Mandillo, S. (2013). Analytic information processing style in migraineurs. *Neurological Sciences*, 34(7). <https://doi.org/10.1007/s10072-012-1193-8>
15. Enaigbe, P. (2010). Strategies for Improving Supervisory Skills for Effective Primary Education in Nigeria. *Edo Journal of Counselling*, 2(2). <https://doi.org/10.4314/ejc.v2i2.60864>

16. Etor, C. R., Mbon, U. F., & Ekanem, E. E. (2013). Primary Education as a Foundation for Qualitative Higher Education in Nigeria. *Journal of Education and Learning*, 2(2). <https://doi.org/10.5539/jel.v2n2p155>
17. Ford, N., Wilson, T. D., Foster, A., Ellis, D., & Spink, A. (2002). Information seeking and mediated searching: Part 4. Cognitive styles in information seeking. *Journal of the American Society for Information Science and Technology*, 53(9). <https://doi.org/10.1002/asi.10084>
18. Gamboa Mora, M. C., Vera-Monroy, S. P., Mejía-Camacho, A., & Guerrero Rueda, W. J. (2021). Perception channels and cognitive styles: opponents, followers, or learning allies? In *Heliyon* (Vol. 7, Issue 2). <https://doi.org/10.1016/j.heliyon.2021.e06242>
19. Griffin, A. S., Guillette, L. M., & Healy, S. D. (2015). Cognition and personality: An analysis of an emerging field. In *Trends in Ecology and Evolution* (Vol. 30, Issue 4). <https://doi.org/10.1016/j.tree.2015.01.012>
20. Guisande, M. A., Páramo, M. F., Tinajero, C., & Almeida, L. S. (2007). Field dependence-independence (FDI) cognitive style: An analysis of attentional functioning. *Psicothema*, 19(4).
21. Hayati, S. N., Sujatmiko, P., & Kurniawati, I. (2020). An analysis of students' written mathematical communication in learning limits of functions through the dependent field and independent field cognitive style at the eleventh grade of SMAN 1 Surakarta. *Journal of Physics: Conference Series*, 1465(1). <https://doi.org/10.1088/1742-6596/1465/1/012038>
22. Julianna, A., & Clinton, I. (2012). Basic issues in primary education delivery in Nigeria. *European Scientific Journal*, 8(1).
23. Khanal, B. (2016). Learning Strategies Used by Urban and Rural School Students in Mathematics. *IRA International Journal of Education and Multidisciplinary Studies* (ISSN 2455-2526), 4(3). <https://doi.org/10.21013/jems.v4.n3.p5>
24. Koć-Januchta, M. M., Höffler, T. N., Eckhardt, M., & Leutner, D. (2019). Does modality play a role? Visual-verbal cognitive style and multimedia learning. *Journal of Computer Assisted Learning*, 35(6). <https://doi.org/10.1111/jcal.12381>
25. Kykalová, M., & Vasilyeva, E. A. (2015). On the Problem of Categorizing Students Based on their Cognitive Styles and Teaching Strategies. *Procedia - Social and Behavioral Sciences*, 176. <https://doi.org/10.1016/j.sbspro.2015.01.513>
26. Mathooko, M. (2009). Actualizing Free Primary Education in Kenya for Sustainable Development. *Journal of Pan African Studies*, 2.
27. Mefoh, P. C., Nwoke, M. B., Chukwuorji, J. B. C., & Chijioke, A. O. (2017). Effect of cognitive style and gender on adolescents' problem-solving ability. *Thinking Skills and Creativity*, 25. <https://doi.org/10.1016/j.tsc.2017.03.002>
28. Nicolaou, A. A., & Xistouri, X. (2011). Field dependence/independence cognitive style and problem-posing: An investigation with sixth-grade students. *Educational Psychology*, 31(5). <https://doi.org/10.1080/01443410.2011.586126>
29. Obiweluzor, N., Momoh, U., & Ogbonnaya, N. O. (2013). Supervision and inspection for effective primary education in Nigeria: Strategies for improvement. *Academic Research International*, 4(4).
30. Odewale, A. D. (2019). Local Government and Primary Education in Nigeria: An Overview. *AFRREV IJAH: An International Journal of Arts and Humanities*, 8(4). <https://doi.org/10.4314/ijah.v8i4.13>
31. Onyekuru, B. U. (2015). Field Dependence-Field Independence Cognitive Style, Gender, Career Choice and Academic Achievement of Secondary School Students in Emohua Local Government Area of Rivers State. *Journal of Education and Practice*, 6(10).
32. Probosiwi, W. I., Suyitno, H., & Dwidayati, N. K. (2019). Mathematical Creative Thinking Ability Based on Intellectual Intelligence and Cognitive Style in SSCS Learning with Open-Ended Problems. *Unnes Journal of Mathematics Education Research*, 11(2).
33. The program, U. N. D. (2019). Background of the Sustainable Development Goals | UNDP. In *Fragile States Index*.
34. Ramli, Boeriswati, E., & Emzir. (2019). The effect of metaphor mind teaching method on field-independent/dependent learners in writing an essay. *Asian EFL Journal*, 23(63).
35. Rawandale, T., Achuthan, S., Doss, S., V. A., & B, V. (2020). Learning style preferences among the urban and rural schoolchildren. *National Journal of Physiology, Pharmacy, and Pharmacology*, 0, 1. <https://doi.org/10.5455/njppp.2020.10.02053202007032020>
36. Robertson, I. T. (1985). Human information-processing strategies and style. *Behavior and Information Technology*, 4(1). <https://doi.org/10.1080/01449298508901784>
37. Roseline, C. O., & Matthew, A. (2020). Pre-primary education: a foundation for achieving sustainable development in Nigeria. *Capital-Journal of Educational Studies (CAJES)*, 6(2).

38. Rosita, N. T. (2018). Analysis of algebraic reasoning ability of cognitive style perspectives on field-dependent field-independent and gender. *Journal of Physics: Conference Series*, 983(1). <https://doi.org/10.1088/1742-6596/983/1/012153>
39. Russo, P., Persegani, C., Carucci, C., Vallini, I., Papeschi, L. L., & Trimarchi, M. (2001). Interaction between cognitive style and school environment: Consequences on self-evaluated anxiety and depression. *International Journal of Neuroscience*, 110(1–2). <https://doi.org/10.3109/00207450108994223>
40. Sadruddin, M. M. (2013). Millennium Development Goals: Are we really achieving Universal Primary Education? *The Dialogue*, 8(1).
41. Saha, S., & Sharma, R. R. K. (2020). The impact of leaders' cognitive style and creativity on organizational problem-solving. *Benchmarking*, 27(8). <https://doi.org/10.1108/BIJ-09-2019-0398>
42. Shohel, M. M. C., & Howes, A. J. (2011). Models of Education for Sustainable Development and Nonformal Primary Education in Bangladesh. *Journal of Education for Sustainable Development*, 5(1). <https://doi.org/10.1177/097340821000500115>
43. Sih, A., & Del Giudice, M. (2012). Linking behavioral syndromes and cognition: A behavioral ecology perspective. In *Philosophical Transactions of the Royal Society B: Biological Sciences* (Vol. 367, Issue 1603). <https://doi.org/10.1098/rstb.2012.0216>
44. Son, A. L., Darhim, & Fatimah, S. (2020). Students' mathematical problem-solving ability based on teaching models intervention and cognitive style. *Journal on Mathematics Education*, 11(2). <https://doi.org/10.22342/jme.11.2.10744.209-222>
45. Ssewamala, F. M., Wang, J. S. H., Karimli, L., & Nabunya, P. (2011). Strengthening Universal Primary Education in Uganda: The potential role of an asset-based development policy. *International Journal of Educational Development*, 31(5). <https://doi.org/10.1016/j.ijedudev.2010.11.001>
46. Suleiman, A. S., Yat, Y., & Iddrisu, I. (2017). Education Policy Implementation: A Mechanism for Enhancing Primary Education Development in Zanzibar. *Open Journal of Social Sciences*, 05(03). <https://doi.org/10.4236/jss.2017.53015>
47. Utama, S., Anif, S., Prayitno, H. J., Narimo, S., Fuadi, D., Sari, D. P., & Adnan, M. (2021). Metacognition of Junior High School Students in Mathematics Problem Solving Based on Cognitive Style. *Asian Journal of University Education*, 17(1). <https://doi.org/10.24191/ajue.v17i1.12604>
48. Sutrisno, S., Rahayuningsih, D., & Purwati, H. (2020). The Impact of Cognitive Style-based Learning Models on Students' Problem-Solving Abilities. *Tadris: Jurnal Keguruan Dan Ilmu Tarbiyah*, 5(2). <https://doi.org/10.24042/tadris.v5i2.5873>
49. Thomson, K., Watt, A., & Liukkonen, J. (2015). Cognitive style and teaching style influence the motor skill performance of 11 and 12-year-old physical education students. *Journal of Physical Education and Sport*, 15(3). <https://doi.org/10.7752/jpes.2015.03077>
50. Threadgill, J. A. (2020). The Relationship of Field-Independent/Dependent Cognitive Style and Two Methods of Instruction in Mathematics Learning. *Journal for Research in Mathematics Education*, 10(3). <https://doi.org/10.5951/jresmetheduc.10.3.0219>
51. Ugwoke, D. I. E. (2018). Repositioning Primary Education in Nigeria: Implications for Mathematics and Science Education. *International Journal of Science and Research (IJSR)*, 7(1).
52. Vargas, O. L., Martínez, C. H., & Uribe, Á. C. (2012). Academic achievement in hypermedia environments, scaffolding self-regulated learning, and cognitive style. *Revista Latinoamericana de Psicología*, 44(2).
53. Witkin, H., Oltman, P., Raskin, E. & Karp, S. (1971). *A Manual for The Group Embedded Figures Test*. In Consulting Psychologists Press, Palo Alto, CA.
54. Witkin, H. A., Moore, C. A., Goodenough, D., & Cox, P. W. (1977). Field-Dependent and Field-Independent Cognitive Styles and Their Educational Implications. *Review of Educational Research*, 47(1). <https://doi.org/10.3102/00346543047001001>
55. Zhdanovich, O. A. (2021). An Experimental Study of Cognitive Styles Incorporation in Teaching Russian as a Foreign Language Online. *Vestnik of Kostroma State University. Series: Pedagogy. Psychology. Sociokinetics*, 27(1). <https://doi.org/10.34216/2073-1426-2021-27-1-197-204>
56. Zhou, R. (2020). Education for sustainable development (ESD) in China's local primary schools: A pilot study. *European Journal of Sustainable Development*, 9(4). <https://doi.org/10.14207/ejsd.2020.v9n4p118>