SELF-CONCEPT AND LOCATION AS CORRELATE OF STUDENTS' ACADEMIC PERFORMANCE IN MATHEMATICS AMONG SENIOR SECONDARY SCHOOLS IN DELTA STATE, NIGERIA

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Abstract
The study investigated self-concept and location as correlates of students' academic performance in Mathematics among senior secondary schools in Delta State, Nigeria. The study was guided by two research questions. The descriptive survey approach was used in this study to examine mathematics as a subject. This becomes imperative because of the general and compulsory nature of the subject in all schools. The population of the study was 105,566 students in Mathematics in senior secondary schools in Delta State. The multi-stage sampling procedure and stratified random technique was used to select sample size of 1,278 for this study. The instrument for data collection was a self-structured questionnaire. The findings amongst other provide that significant connection existed between self-concept and students academic performance in Mathematics. It was recommended that the school management via the teachers should understand the self-concept of the child he or she is going to teach in order to help him or her to learn and also, government should provide more learning materials to rural schools in order to avoid migration to the urban schools.

Keywords: Self-Concept, Location, Mathematics, Academic Performance

Introduction

Generally, there have been lots of concerns about students' performance in mathematics by parents, teachers, administrators, examination bodies and other stakeholders. This concern is borne of the fact that from both print and electronic media, the percentage of students' performance in examinations particularly external examinations in Mathematics is not encouraging. Mathematics as a core subject in the Nigerian curriculum must be passed at the credit level before a student is admitted into the university or other tertiary educational institutions. This concern for mathematics becomes germane because every parent wants their children to pass mathematics at the credit level in order for them to secure admission into higher institution (Ajmal and Rafique, 2018). However, not every student who enrolls for mathematics in external examination passes it at the credit level. The head of National Office, WAEC, noted that there has been a fluctuating performance in the subject within the last 7 years with a percentage range of between 16% to 32%. From these figures, it has been observed that this trend of the drop in students' performance in Mathematics has become a recurring decimal over the years.

Okafor and Anaduaka as cited by Ugodulunwa (2017) posit that most Nigerian students have phobia for mathematics and this has led to a high failure rate in mathematics by senior secondary school students. A lot of research has been done on both internal and external factors which aid student performance in various subject areas like the study of Adebule (2014) and Ameen (2018). The above studies looked at

some of the factors that determine students' academic performance in a specific subject area such as Mathematics. Mathematics has been a core subject in Nigeria educational curriculum and its importance cannot be overemphasized as it is compulsory for all students to have at least a credit in it before they can be admitted into any tertiary institution. Unfortunately, most Nigerian students have phobia for mathematics. It is noted with dismay the general negative students' attitude towards the subject and their consequent poor performance in it, especially in the West African Senior School Certificate Examination (WASSCE). They then looked at the attributes of a mathematics teacher that can bring about a change in the teaching and learning of mathematics and in the attitude of students towards the subject. They finally considered best practices for mathematics instruction, such practices that can stimulate and sustain students' interest in mathematics learning. Other factors that can be considered includes self-concept, parental involvement and emotional intelligence. Mathematics has being a core subject in Nigeria educational curriculum and its importance cannot be overemphasized as it is compulsory for all students to have at least a credit in it before they can be admitted into a tertiary institution.

The term self-concept according to Lohbeck, Tietjens and Bund (2016) is a general term used to refer to how someone thinks about or perceives him/herself. This definition indicates that self-concept involves evaluation of oneself. It is the ability to become aware of oneself, by implication, self-concept as a concept in educational psychology implies providing opportunities for learners to be able to become aware of their strength and weaknesses academically. The purpose is to improve the individual's performance in school subjects. Thus, self-awareness is an important aspect of developmental process in the three domains of knowledge – cognitive, affective and psychomotor.

The educational interpretation of self-concept provides a framework for accurate judgment of a learners' academic performance. The importance of self-concept stems from its notable contribution to personality formation. This is because, self-concept has to do with social competence since it influences how a person thinks, learns, values him/herself, relates to others and ultimately, how he or she behaves (Nzwili, 2017). The issues explained above have their different impact in correlating with students' performance in mathematics at senior secondary school level. In this light therefore, this paper was designed to examine the relationship between self-concept and location as it correlates senior secondary school students' performance in Mathematics in in the area under review.

Self-Concept and Academic Performance among Students in Mathematics

Learning of the individual could be enhanced or hampered depending to a great extent on the learners' self-concept. Learning is described by the Merrian-Webster Dictionary (2014) as the process of acquiring a modification in a behavioural tendency by the experience such as exposure to teacher conditioning in contrast to modifications occurring because of development or a temporary physiological condition of the learner. If this is true, to get the best in every learner, instructors and classroom teachers ought to understand the personality traits of the individual child

he or she is going to teach. By implication, in order to help students to learn, teachers of education should pay attention to the child's self-concept.

Wilson (2012) as cited by Zarick and Stonebraker (2019) tends to associate academic ability to students' self-concept. He believes that the measure of ability and achievement of learners should be tracked from the learner's self-concept. According to him, ability and achievements are important concept in the determination of a successful educational programme. He views ability as the capacity that a student has for intellectual and/or academic endeavour, while achievement is the level to which a student is performing within his or her academic programme. From the foregoing, it is clear that students' self-concept is related to their academic achievement. This assertion is based on the assumption that students with lower levels of academic achievement have lower self-concept than students with high levels of academic achievement. Thus, it is assumed that students with more positive self-perception of their academic ability tend to do better in school than students who consider themselves to be poor learners. Therefore, for a better and improved learning environment, students consider to be experiencing low level of self-concept should be enhanced. There is the possibility towards enhancing a students' self-concept, using variety of classroom intervention techniques. Utilization of such intervention approaches by the teacher can improve the self-concept of low performing students or learning disabilities. Most refereed approaches in this regard consist of; the self-enhancement approach and the skill development approach

According to Salami and Aremu (2016), self-enhancement is the desire to maintain and cultivate positive feelings of oneself. That is the driving force behind the search for self-knowledge. In the opinions of Sedikides and Gregg as cited by Anyanwu (2018), self-enhancement involves a preference for positive over negative self-views. One of the approaches suggested by Salami and Aremu (2016) for self-enhancement includes strategic construal. This method involves creating a concept of the word based on the individual's strength and weakness. In which case, the individual is led to diagnose abilities they hold as being more telling of their selves than skills they lack.

Advancing the above idea, Herrera, Al-Lai and Mohamed (2019) notes that self-concept is often considered as the cognitive or thinking aspect of self. According to him, it generally refers to the totality of a complex, organized and dynamic system of learned beliefs, attitudes and opinions that each person holds to be true about his or her personal existence. This held notion is often transmitted and exhibited in the classroom during teaching and learning process. Hence, the classroom is seen as the ideal environment for enhancing students' self-concept that is noticed to be negative which affect learning outcome in subject-matter.

Location and Academic Performance

The impact rural or urban location bears on students' self-concept and their academic achievement in school subjects will continue to be studied especially with arrival of new findings from demographic analytical data. Eme (2014) for instance examines academic self-concept and academic

achievement of African America students transitioning from urban to rural schools. The result of the study indicated that there is a significant relationship between academic self-concept and academic achievement measures among urban and rural students. The finding suggests that the drift is always from rural areas to urban cities. Ajaero and Onokala (2013) examine the effects of rural-urban migration on rural communities of Southeastern Nigeria and found out that rural-urban migration contributes significantly towards the development of their rural communities through monetary remittance and the involvement of the rural-urban migrant in community projects. This findings support the notion that there is differentiation in perspective held about rural in Nigeria.

The concept of rural in Nigeria according to Herrera, Al-Lai and Mohamed (2019), is that part of the country which is characterized by lack of pipe borne water or water from the bore holes, abundance of guinea worm infested water, absence of electricity, lack of accessible roads or means of communication, absence of educational institutions as where they exist, the distance between the institution and inhabitants are such that only very determined students could take advantage of it, lack of basic health facilities, absence of courts of law, absence of lawyers, about 80% of Nigerian resides there, the major economic activity is subsistence farming, poverty is the order of the day, the standard of living is very low. The indices contained in the description of rural Nigeria provides a leverage for the unavoidable drift of the youth, including school age young adults to consider moving to the urban cities which

supposedly provides the opportunity for lifelong learning facilities.

A study by Achuonye (2015) in an attempts to compare the literacy of students in urban and rural primary schools in River State, Nigeria using computers, found that computers are more available in urban schools than rural schools even though in both areas, pupils' access to computers is very low. In addition, the finding indicates that more teachers in the urban school were computer literate than those in rural areas. The indication from this finding shows that urban area tends to support learning because of the availability of social amenities found almost everywhere in the cities. Alordiah and Akpadaka (2015) agree with the fact that school facilities are potent to high academic achievement of students and thus recommend that government should provide adequate material resources to rural/urban locations to enhance teaching and learning process. The belief that the material resources are supplied to urban school in high quantity is not in doubt. This is so because of the rapid transformation being experienced in the urban setting as against the rural setting in the state.

Herrera, Al-Lai and Mohamed (2019) revealed that urban secondary school teachers had an average weekly workload of 16 periods, while their rural or their remote counterparts had 26 periods. Indicating that the rural secondary teachers were not only adequately utilized but they were more utilized than the urban secondary school teachers, meaning that there is less workload for urban teachers due to availability of teachers in urban schools. The implication is that workload variation is associated with teacher location, while urban teachers seem less stressed, rural teachers are more

stressed. The education implication of this finding is that, there is likelihood that academic performance will be negatively affected in the rural areas due the possibility of non-commitment by instructors. This is in addition to students' attitude towards learning in the rural setting, that can best be describe as discouraging to say the least.

Statement of the Problem

Several factors have been adduced for students' poor performance in mathematics. Some of such factors are poor attitude of students towards mathematics, attitude of teachers and their professional qualification, deficiency in some instructional materials, socio-economic background (environmental factors) among others. Several researches have also been carried out to find solution to students decline in Mathematics performance, yet the problem persists. As already stated by Eme (2014), that most students have phobia for Mathematics which to a large extent is associated with their self-concept with regards to their physical, mental and social well-being within and outside the school setting. These issues tend to influence their Mathematics performance, leading to a poor performance and by extension, a high failure rate in the subject. However, this present study wants to address the problem of students poor performance in Mathematics from the perspective of self-concept and location. Thus, the problem of the study is to examine the connection of self-concept and location as correlates of students' academic performance in Mathematics at the senior secondary schools level in Delta State. Put more succinctly, how do self-concept and location influence the academic performance of students in

Mathematics in senior secondary schools in Delta State?

Research Questions

The following research questions are raised to guide the study.

- To what extent does self-concept influences students' performance in Mathematics?
- Which of the location affects students' performance in mathematics?

Methodology

The study is a descriptive survey design. The target population cuts across the three senatorial district in Delta State which consists of 105,566 students in Mathematics in senior secondary schools (Delta Central – 41, 310; Delta North – 40, 603 and Delta South – 23, 653) drawn from 25 local government areas of Delta State. The sample of this study consisted of 1,278 students chosen by means of stratified and multi-stage sampling procedure. This was done by dividing the state in their various senatorial districts. The instrument for data collection is a questionnaire developed by the researcher. The questionnaire is titled: "self-Concept, Location and Academic Performance in Mathematics (SCLAPM). Mean and standard deviation was used to answer the research questions, employing a mean score benchmark of 2.50 and above for acceptance and a mean less than 2.50.

Results and Discussion
Research Question 1

To what extent does self-concept influences students' performance in Mathematics?

Table 1: Mean and Standard Deviation on Self-concept influences on students' performance in Mathematics

S/N	Item	N	$\overline{x}$	St.D	Decision
1.	My ability to learn the subject hampered by many factors which in turn influences my performance	1278	3.33	0.82	Accepted
2.	My physical, mental and spiritual disposition enhances my comprehension of the subject	1278	3.20	0.86	Accepted
3.	The behaviour of my classmates and teachers in school affects my performance in Mathematics	1278	3.02	0.84	Accepted
4	I perceive myself as been able to understand Mathematics irrespective of the methods adopted	1278	3.32	0.83	Accepted
5	Finance is a major problem affecting my performance in the subject	1278	3.65	0.64	Accepted

From Table 1, it was revealed that all the item measuring self-concept influences on students' performance in Mathematics was accepted as reflected in the mean score above the benchmark of 2.50. The implication from the above is that self-concept of students play a large role in their comprehension of Mathematics. Implicit here is that, instructors should take cognizance of students self-concept in the pedagogical process as this will go a long way in enhancing performance in the subject.

Research Question 2

Which of the location affects students' performance in Mathematics?

Table 2: Mean and Standard Deviation of the effect of location on students' performance in Mathematics

S/N	Item	N	Urban		Decision	Rural		Decision
			$\overline{x}$	St.D		$\overline{x}$	St.D	
1.	My residential environment is a problem to my comprehension of Mathematics	1278	3.33	0.82	Accepted	3.00	0.84	Accepted
2.	Location has no effect in my Mathematics performance in school	1278	3.20	0.86	Accepted	3.30	0.81	Accepted
3.	The lack of some amenities in my school has effect on my performance in the subject	1278	3.02	0.84	Accepted	2.49	0.59	Rejected
4	The physical facilities in my school enhance my performance in the subject	1278	3.32	0.83	Accepted	2.68	1.10	Accepted
5	The qualification of teachers in my school influences performance in the subject	1278	3.65	0.64	Accepted	2.16	0.47	Rejected

From Table 2, it was revealed that, urban as a location influencing students' performance in Mathematics has items measuring the variable accepted by the respondents as reflected in the high mean score achieved ranging from 3.02 to 3.65. The implication here is that, urban as a location does not affect students comprehension and performance in the subject under review. Also, rural as a location influencing students' performance in Mathematics has three (3) of the items measuring the variable accepted while two (2) were rejected. This entails that the rural setting in which students reside affect their comprehension and performance in

Mathematics. Implicit here is that urban and rural setting, with regards to learning of Mathematics affect students comprehension and performance differently in the area under review.

Discussion

The result in research question 1 showed that self-concept influences students' academic performance in Mathematics in senior secondary schools in Delta State. Self-concept is considered as the cognitive or thinking aspect of self that could be seen as the totality of organized and dynamic system of learned beliefs, attitude and opinions that each person held to be true about his or her personal existence which is extended to the subject under review. The finding supports the studies of Anyanwu (2018) and Nuthana and Yenagi (2015) who respectively reported a significant relationship between self-concept of students and their academic performance and who also stated that self-concept is a strong facilitator of academic achievement and that a positive or negative change in self-concept tends to produce a commensurate change in academic achievement or performance. This is also in line with Ajmal and Rafique (2018) who revealed that self-concept significantly relates to academic performance as shown in students' positive leaning towards Biology as a subject.

The finding from research question 2 indicated a differential disposition between urban and rural location where the study was undertaken; with the urban location favouring students' comprehension and performance in the subject, while the rural setting records some positive learning and some negative learning with regards to the subject under review. Thus, it could be deduced that location has both positive and negative effect with regards to students' comprehension and performance in Mathematics. The finding is in line with Alordiah and Akpadaka (2015) who observed that there exists a significant difference between academic performance of students in rural and urban area in public examination. The study also supported the work of Eme (2014) who found that significant difference exists in the academic performance of students in urban and rural secondary schools.

Conclusion

The study is on self-concept and location as correlates of students' academic performance in Mathematics among senior secondary schools in Delta State, Nigeria. From the findings above, the study established that self-concept of students have a positive connection to students' academic performance in Mathematics in the area under review; while location as an influencing variable has a differing effect on students' performance, with the urban setting achieving a positive connection as against the rural setting with a mixed outcome in performance. It is safe to say that students in the urban areas perform academically better than their rural counterparts when taught Mathematics

Recommendations

In line with the findings, the following recommendations were made:
i.   The school management via the teachers in secondary school system should understand the self-concept of a child he or she is going to teach in order to help the student to learn.
ii.   Government should provide more learning materials to rural

schools in order to avoid migration to the urban schools, which can lead to overcrowding that can affect the pedagogical process.

References

Adebule, S. O. (2014). Self-concept and academic performance in mathematics among secondary school students in Ekiti State. *Scholars Journal of Engineering and Technology (SJET),* 2(2), 348-351.

Ajmal, M. & Rafique, M. (2018). Relationship between academic self-concept and academic achievement of distance learners. *Pakistan Journal of Distance and Online Learning,* 4(2), 225-244.

Alordiah, C. C. & Akpadaka, G. (2015). The Influence of gender, school location and socio- economic status on students' academic achievement in mathematics. *Journal of Education and Practice*, 6(17), 130-136.

Ameen, K. (2018). Perception and self-assessment of university librarians regarding collection management (CM): A case of Pakistan. *Collection Building* 24(4), 167- 173.

Anyanwu, R. I. (2018). Impact of study habits on self -concept and academic performance in biology among senior secondary school students in Zaria, Kaduna State, Nigeria. Unpublished MEd dissertation [School of Post Graduate Studies], Ahmadu Bello University, Zaria, Kaduna State.

Eme U. J. (2014). School variables and mathematics performance among students in Akwa Ibom State. *International Journal of Development and Sustainability*, 3(7), 1558-1568.

Herrera, L., Tietjens, M. & Bund, A. (2016). Physical self-concept and physical activity enjoyment in elementary school children. *Early Child Development Care*, 186, 1792-1801

Merriam-Webster Dictionary (2014). *Learning*. www.merriam-webster.com

Nzwili, K. M. (2017) availability of resource materials and facilities for ICT integration in the public primary school curriculum in Kitui County, Kenya. *Saudi Journal of Humanities and Social Sciences*, 2(5), 362-368. DOI: 10.21276/sjhss

Salami, S.O. & S. Aremu (2016). Relationship between problem-solving ability and study behaviour among school-going adolescents in southwestern Nigeria. *Electronic Journal of Research in Educational Psychology* 4 (1), 139-154

Ugodulunwa, C. A. (2017). The attitude of students to cheating in examination. In: Aghenta, J. A. & Lassa, P. N. (Eds). Proceeding of the 16th annual congress of the Nigerian Academy of Education. Jos: University of Jos

Zarick, L. M., & Stonebraker, R. (2019). I'll do it tomorrow. *College Teaching*, 57(4), 211- 215.