

IMPACT OF REDUCED VISUAL ACUITY ON ACADEMIC PERFORMANCE AMONG SENIOR SECONDARY SCHOOL STUDENTS, LAFIA, NASARAWA STATE, NIGERIA

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ABSTRACT

This study examined the impact of reduced visual acuity on academic performance among Senior Secondary (SS1-SS2) School Students in Lafia, Nasarawa State. The study adopted an expo-facto research design and purposive sampling technique to select participants based on a predetermined criterion. From the total population of 1500, 306 were sampled through an online sample size calculator. Data for this study was collected among the selected 92 students with reduced visual acuity using a combination of self-administered and interviewer-administered questionnaires. The questionnaire was structured in three sections: Section A, determined the bio-data of the students, Section B, contained a record of the visual acuity measurements of the students (as determined using the Snellen's chart) while Section C contained the scores of the test questions. An alphabet Snellen's chart was hanged on a wall at a distance of 20 feet away from the students in a well-lit room/ classroom. Only students with a visual acuity from 20/30 and above in both eyes were assessed by making them respond to some questions that were written on the board by the researchers. Three hypotheses were tested and the result of hypothesis one indicated that reduced visual acuity significantly have a relationship with academic performance [$X^2(29) = 60.124, P < .05$]. The result of hypothesis two revealed that there was no gender difference in academic performance among students with reduced visual acuity [$t(90) = .843; p > .05$]. Lastly, the result of hypothesis three indicated that age significantly have a relationship with academic performance among students with reduced visual acuity [$X^2(4) = 12.800; p < .05$]. The study concluded that there was presence of reduced visual acuity among students of Government Secondary Schools, Lafia, Nasarawa and this has contributed significantly to poor academic performance. The study recommended that there should

be periodic school screening programmes to identify students with poor visual acuity so that if identified and helped appropriately, it would avert poor academic performances of students.

Keywords: Impact, Visual acuity, Reduced Visual Acuity, Academic performance, Senior Secondary Students, Lafia.

Introduction

Nowadays, academic performance at different educational levels has become a very important subject of study in local, national and international institutions. The OECD's Program for International Student Assessment (PISA report 2019), which has been carried out annually since 2000, has a great impact, and makes the governments of the different studied propose educational policies to improve the performance of their students.

The academic performance of children is recognized as one of the major indicators of a strong society (Maples, 2001). Historically, the western world's educational system was designed to supply workers for an industrial society. Now, a more service-oriented work force is needed. If children are not prepared for the changing service-oriented society, they may not be able to adequately compete for jobs in the global economy (Clinton, 1999). Not only have the educational needs of Western society changed, but the speed at which the world moves is taking its toll on both the child and the adult. Our society's pace is much faster today than it was in previous generations (Morse, August, Bacon & et al., 2001). Parents who once were involved in child-oriented and school activities find their time taken up with other endeavors. It is clear that education must adapt to the sociological changes in order to address the needs of this society in the twenty first century.

Academic performance is conditioned by many factors; some of them come from the context and others from the person (González, 2003). This makes it necessary that governments propose policies that help to improve all of the aspects that can affect academic performance, rather than simply making changes in syllabi or learning methods. Children's health affects their academic performance, influencing the educational aspiration of adolescents. These aspirations are lower in students that have suffered from health problems (Dobewall, Lindfors, Karvonen, Koivusilta, Vainikainen, Hotulainen, & Rimpelä, 2019).

One of the major factors that contribute to academic failure is poor sights. The eyes play vital role in our lives and are perhaps the most gift we have. Visual perception or vision is the ability to interpret information and surroundings from the effects of visible light reaching the eye. Vision is a dynamic process that integrates sensory and motor information generated by the brain and body to derive meaning and direct movement. Visual acuity is the acuteness or clarity of vision which is dependent on the shortness of the retinal focus within the eye, and the sensitivity of the interpretative faculty of the brain. Visual impairment has good prognosis if it is detected early as it is amenable to treatment, both through the use of proper eyeglasses and lifestyle modification. Vision allows us to take what we see and process it so we can identify what we see by its characters, store information for future retrieval, and integrate the sight information and other senses (touch, hearing, taste and smell) and compare the information with the previously stored information (College of optometrists, 2011). Visual impairment is any visual condition that impacts an individual's ability to successfully complete the activities of everyday life which include academic activities and other leisure

activities such as playing ball, watching television and involvement in other recreational activities. Students with visual impairments are infants, toddlers, children and youths who experience impairments of visual system that impact their ability to learn. Reduced vision often results in a low motivation to explore the environment, initiate social interaction, and manipulate objects. These students cannot share common visual experiences with their sighted peers, and therefore vision loss may negatively impact the development of appropriate social skills (America Foundation for the Blind, 2011).

Statement of the Problem

There have been a number of high failure rates in schools these days in Nasarawa State. The academic performance of a number of students has not been to their expectations and that of their parents as they have been performing poorly. What else has not yet been done to solve the problem? Emphasis on school and home lesson participation, clinics, and study groups have been put in place by some schools and parents to improve the performance of their children but without much success. Meanwhile, others have incorporated virtual learning as an adjunct to physical leaning in order to combat the alarming poor academic performance of students but all to no avail. In this era, schools have introduced the use of projector in the delivery of lectures to help the myopic and slow learning students catch up easily but the expected returns have not helped much to improve the general academic performance of students.

Visual impairment presents a major area that requires intervention, such that if detected early is amenable to treatment, both through the use of proper eyeglasses, and lifestyle modification. Some surveys have demonstrated the importance of early diagnoses of visual problems, as an essential means of minimizing and preventing severe problems in the future: in developing countries like Nigeria, the scenario is even more worrisome. Data showed that 80% of blindness worldwide occur in developing countries and two-thirds of each case are either preventable or durable (Chuka-Okosa, 2005). It is estimated that 2.3 billion people worldwide suffer from refractive errors. The vast majority of these people could have their sight restored by spectacles, but only 800 million people have access to eye examinations and affordable correction. Children compose about 1/3 of the majority, who cannot access or afford eye examination. Children constitute about 45% of the population of Nigeria with about 15-20% within the age of 10-18 years. School children are a captive population and are relatively accessible to intervention. This facilitates easy and early assistance to any child with visual problems (Chuka-Okosa, 2005). Undetected or under corrected disorder of visual acuity are known to affect the learning abilities of school children who have difficulty to read off what is written on the blackboard (Okoro, & Odepemi, 2013). This can adversely affect a child's learning, health, education needs and socio-economic status for life. Impairment in vision, if not corrected gets worsened with time, and might result in blindness. The rising cases of visual impairment, and its' related complications can be attributable to improper use of eyeglasses, and inadequate knowledge of its risk factors (Okoro, & Odepemi, 2013). Through the process of visual acuity testing, defective school children can be identified, and necessary adjustments effected in such areas, as their sitting arrangements in the classroom, teaching methods, instructional materials in use, and health care services offered to them (Okoro, & Odepemi, 2013).

Visual health can have a great influence on students' academic performance. Shin, Park, and Park, (2009) have already highlighted those visual disorders are one of the best predictors of academic performance. Poor vision may even lead to students to drop out of school as a result of chronically poor academic performance. However, there is little or no evidence on the impact of vision acuity on academic performance among Government secondary school students, Lafia, Nasarawa state which the present study sought to examine.

Literature Review

In the quest to identify factors responsible for poor academic performance among students, various studies have been carried out and one of the major factors identified was poor vision which has even led students to drop out of school as a result of chronically poor academic performance. Take for instance, Kotingo, Daniel, Tochi, Ejime, and Taribo (2020) in their study on effects of reduced visual acuity on academic performance among Secondary School Students in South-South Nigeria, found out that of the population studied had normal visual acuity while 28.29% had reduced visual acuity. 57.77% of those with normal visual acuity had good academic performance ($\geq 50\%$ average academic score). While 42.23% of those with normal acuity had poor academic performance (average academic score less than 50%). Of the 99 students with reduced visual acuity 42.42% had good academic performance ($\geq 50\%$ average academic score), while 57.58% of those with reduced visual acuity had poor academic score (average $< 50\%$). Their study revealed that visual acuity had a significant impact on their academic performance. Similarly, the result of the study conducted by Jan, Li, Kang, Liu, Li, Jin, Qin, Congdon, and Wang (2019) showed that better vision is associated with better scores among children.

Furthermore, Wood, Black, Hopkins and White (2018) in their study on vision and academic performance in primary school children indicated that worse eye visual acuity showed the strongest associations with poorer academic performance. However, these associations were limited to the grammar/punctuation and numeracy while reduced better eye visual acuity was significantly associated with poorer Numeracy scores.

In the same vein, Ubajaka, Ebenebe, Nwankwo, Egenti, Adogu, and Ejiofor (2016) in their study on visual acuity status amongst Secondary School Students in South East, Nigeria, indicated that there was a translational relationship between visual impairment and academic performance. The study revealed that out of 134 students whose visual acuity were tested, 111 (82.8%) had academic performance greater than 50%, whilst 23 (17.2%) have academic performance below 50%. Among students with normal VA, 87.9% had satisfactory performance, while among those with a poor VA, only 68.6% had satisfactory performance. In another related study by Bruce, Fairley, Chambers, and et al (2015) indicated that decreased visual acuity at school entry is associated with reduced literacy compared to others without reduced visual acuity.

Furthermore, Chen-AH et al. (2011), in his study conducted among 1, 103 school children in 7 public schools in the Klang valley region of Malaysia, showed that children with average and above average achievement showed a different visual performance profile from those with low academic performance. They had statistically better pass in visual acuity tests. So, children with low academic performance are more likely to exhibit problems in visual acuity. Furthermore, Sarina Goldstand et al (2005), in a study conducted among seventh graders to

compare visual and information processing skills between children with and without mild reading and academic problems and examine the visual defects among them. Visual defects were found among 68% of the participants, non-proficient readers had significant poor academic performance and low vision screening scores than the proficient reader. These findings point to the fact that children with low academic performance are more likely to exhibit problems in visual acuity than children with good academic performance.

Conversely, Alahmar, Ali and Abudlaziz (2018) in their study on the effect of visual acuity and anemia on academic performance of pharmacy students indicated that reduced visual acuity did not predict poor academic performance as compared to students with good visual acuity. Similarly, Dirani, Zhang, Goh, Young, Lee, and Saw (2010) revealed in their study on the role of vision in academic school performance that children without ocular disease, distance visual acuity did not play a significant role in predicting academic school performance.

In attempt to understand the extent to which gender and age differ on academic performance, some literatures were reviewed. Take for example, Orji, Archibong, Ogbonnaya, Nkpoyen, and Edet (2021) in their study which aimed to examine the extent to which gender impact on academic performance of University Nursing Students in South-South and South-East Zone of Nigeria using survey design, indicated that, demographic characteristic, in terms of gender, when considered individually does not significantly influence academic performance. Similarly, Aransi (2018) in his study which sought to examine the impact of age and gender on High School students' academic performance in Economics in Irewole and Isokan Local Government Areas of Osun State, Nigeria adopting expo-facto research design which was qualitative and quantitative in nature and purposeful sampling technique to obtain six-hundred and fifty-six (656) Grade 10 (SSS ONE) students from the target population of the study. The finding of the study indicated that there was no interactive influence of gender and age on the academic performance. However, positive but weak linear relationship existed between age and performance while there was significant difference in the academic performance of the High School students on the basis of gender but in favour of female students. In another related study, Ebinuwa-Okoh (2017) in his study indicated that there was no significant difference in academic performance based on age, gender and financial status. Lastly, Joseph, John, Eric, Yusuf and Olubunmi (2015) in their study which examined the relationship between student's gender and academic performance in computer science in New Bussa, Borgu local government of Niger state, using questionnaire which consist of 30 multiple-choice items drawn from Senior School Certificate Examination past questions as set by the West Africa Examination Council in 2014 multiple choices past question was used as the research instrument consist. The questionnaire was administered to 275 students from both private and public schools in the study area. The students' responses were marked and scored, afterward analysed using independent t-test. The results of the study showed that even though the male students had slightly better performance compared to the female students, it was not significant.

Momanyi, Too and Simiyu (2015) in their study on the effect of students' age on academic motivation and performance among high school students in Kenya. The study adopted the ex-post facto research design. The target population comprised all Form two and Form four students in the sixteen secondary schools in Nakuru municipality from which seven-day

schools were sampled using the stratified random sampling technique. The sample was made up of 489 students. The result of the study revealed that students' age had a significant effect on the student's academic performance. The study specifically indicated that students who were in the youngest category performed better and higher than older students. Furthermore, Eze, Ezenwafor and Obi (2015) reported that age and gender had no linear relationship with academic performance, and even that their joint influence was insignificant. Similarly, John, Jackson and Simiyu, (2015) lamented that the chronological age of a students had a significant bearing on his/her academic performance such that the youngest one had the potential of having higher score than his/her oldest counterpart in the teacher made test.

As we can infer from the studies reviewed, there has not been any known study on the effect of visual acuity on academic performance among students in Nasarawa state of Nigeria. Therefore, this present study will contribute to knowledge and also assists in identifying students with poor visual acuity and proper referrer would be made for proper treatment.

Research Hypotheses:

1. Reduced visual acuity will have a significant relationship with academic performance among secondary school students
2. Gender will significantly differ on the measure of academic performance among secondary school students.
3. Age will significantly have a relationship with academic performance among secondary school students

Method

The study adopted an expo-facto research design. The present study was carried out in three Government Owned Secondary Schools in Lafia, Nasarawa state which were conveniently selected. The total population of SS1-SS2 students in these schools Government Secondary School, Lafia is One thousand five hundred (1500) students. The study adopted an online sample size calculator to calculate the sample size. In this instance, the population was calculated at 5% margin of error, confidence interval of 95%, and predetermined response distribution of 50%. Based on the calculation, a sample size of three hundred and six (306) was generated and the visual acuity of this number of students was assessed in the study. A purposive sampling technique was adopted to select participants. At the end of the exercise, ninety-two (92) students whose visual acuity score from 20/30 were given some questions to answer.

Instrument for Data Collection

Data for this study was collected among the selected students using a combination of self-administered and interviewer-administered questionnaires. The questionnaire was structured in three sections: Section A, determined the bio-data of the students, Section B, contained a record of the visual acuity measurements of the students (as determined using the Snellen's chart) while Section C contained the scores of the test questions. An alphabet Snellen's chart was hanged on a wall at a distance of 20 feet away from the students in a well-lit room/classroom. Visual acuity was measured one eye at a time (monocular) with each student standing and facing the chart, and then reading out the letters on the chart starting from the biggest one to the smallest readable letter. The eye not being measured will be covered by the palm of the student as was indicated by the researcher. In this study normal visual acuity was

20/20. In order to examine the relationship between reduced visual acuity and academic performance, only students with a visual acuity from 20/30 and above in both eyes were assessed by making them respond to some questions that were written on the board by the researcher. The parents of these students were notified and referred to a clinic for specialist assessment and adequate treatment when necessary.

Data Analysis and Results

Test of Hypothesis One: This stated that reduced visual acuity will have a significant relationship with academic performance among secondary school students.

Summary of Chi-Square Results Showing the Relationship between Reduced Visual Acuity and Academic Performance

			Exams Scores Regrouped					Total
			Extremely Poor	Poor	Average	Good	Excellent	
Visual Acuity	20/30-Poor Visual Acuity	Count	19	0	1	0	0	20
		% Within Visual Acuity	95.0%	0.0%	5.0%	0.0%	0.0%	100.0%
		% Within Exams Scores Regrouped	27.9%	0.0%	25.0%	0.0%	0.0%	21.7%
	20/40-worse Visual Acuity	% Of Total	20.7%	0.0%	1.1%	0.0%	0.0%	21.7%
		Count	49	13	3	4	3	72
		% Within Visual Acuity	68.1%	18.1%	4.2%	5.6%	4.2%	100.0%
		% Within Exams Scores Regrouped	72.1%	100.0%	75.0%	100.0%	100.0%	78.3%
	Total	% Of Total	53.3%	14.1%	3.3%	4.3%	3.3%	78.3%
		Count	68	13	4	4	3	92
		% Within Visual Acuity	73.9%	14.1%	4.3%	4.3%	3.3%	100.0%
Total	Within Exams Scores Regrouped	Count	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
		% Of Total	73.9%	14.1%	4.3%	4.3%	3.3%	100.0%

Dependent Variable: Academic Performance; [$X^2(29) = 60.124, P < .05$]

The table above presents the results of the hypothesis stating the relationship between reduced visual acuity and academic performance among secondary school students in Lafia, Nasarawa State. As indicated in the table above, it was reported that there was a total of 92 students from the three schools with abnormal visual acuity. From the table, 68 (73.9%) of students with reduced visual acuity extremely performed poorly in the tests given, 13 (14.1%) performed poorly in the tests given, 4 (4.3%) had an average score in the tests given, 4 (4.3%) performed good in the tests given, and lastly, 3 (3.3%) performed excellently. The Chi-Square analysis revealed that reduced visual acuity significantly had a relationship with academic performance [$X^2(29) = 60.124, P < .05$].

Test of Hypothesis Two: This stated that gender will significantly differ on the measure of academic performance among secondary school students.

Summary of T-Test Indicating Gender Difference on The Measure of Academic Performance of Secondary School Students with abnormal visual acuity

Gender & Academic Performance	N	Mean	SD	df	t	P
Male	47	32.17	18.085	90	.843	>.05
Female	45	31.40	19.215			

The table above presents the result of the independent sample t-test showing the difference between male and female on the measure of academic performance. As shown above, Male students (Mean= 32.17; SD= 18.085) slightly differ in mean than Female students (Mean= 31.40, SD= 19.215). In order to establish the significance of the mean difference, an independent sample t-test was used. The result indicated that there was no significant difference male students and female students on academic performance [$t(90) = .843$; $p > .05$]. This signifies that once there is abnormal or reduced visual acuity without proper care, academic performance is negatively affected regardless of gender differences.

Test of Hypothesis Three: The hypothesis stated that age will significantly have a relationship on academic performance among secondary school students.

Summary of the Chi-Square Showing the Relationship between Age and academic performance among secondary school students

		Exams Scores Regrouped					Total
		Extremely Poor	Poor	Average	Good	Excellent	
Age Regrouped	Younger Adolescents	53(81.5%)	6(9.2%)	3(4.6%)	3(4.6%)	0	65
	Older Adolescents	15(55.6%)	7(25.9%)	1(3.7%)	1(3.7%)	3(11.1%)	27
Total		68	13	4	4	3	92

[$\chi^2(4) = 12.800$; Sig= .012; $p < .05$]

As shown in the table above, those in younger adolescents' category, 53 (81.5%) performed extremely poor, 6 (9.2%) performed poorly, 3 (4.6%) performed averagely, 3 (4.6%) had a good score, while non in the category had an excellent score. In the older adolescents' category, 15 (55.6%) performed extremely poor, 7 (25.9%) performed poorly, 1 (3.7%) performed averagely, 1 (3.7%) had a good score, while 3 (11.1%) performed excellently. The result of the chi-square

analysis indicated that age significantly have a relationship with academic performance [$X^2(4) = 12.800$; Sig= .012; $p < .05$]

Discussion of Findings

The study sought to examine the impact of visual acuity on academic performance among students of some selected senior secondary schools in Lafia, Nasarawa State. The result of hypothesis one indicated that visual acuity significantly had a relationship with students' academic performance. The result of the finding supports the findings of Kotingo et al. (2020); Jan et al. (2019); Wood et al. (2018); Ubajaka et al. (2016); Chen-AH et al. (2011); and Goldstand (2005) whose independent findings indicated that poor academic performance is related to poor visual acuity. Although, the result of the present finding disagrees with the findings of Alahmar et al. (2018); and Dirani et al. (2010) whose findings revealed that poor visual acuity did not predict academic performance.

The result of hypothesis two revealed that there was no gender difference on the measure of academic performance among senior secondary school students. The result of the present finding is in consonance with the results of Orji, Archibong, Ogbonnaya, Nkpoyen, and Edet (2021); Aransi (2018); and Ebinuwa-Okoh (2017); and Joseph et al. (2015) whose independent results revealed that gender difference is insignificant in predicting academic performance among students.

Lastly, the result of the third hypothesis indicated that age had a significant relationship with academic performance. The result is in tandem with the results of Momanyi, Too and Simiyu (2015); and John, Jackson and Simiyu, (2015) whose findings showed that age influence academic performance indicating that younger students tend to perform better than older students. The result of the present study did not agree with the finding of Eze, Ezenwafor and Obi (2015) which indicated that there was no age difference in academic performance among students meaning that age had no influence on academic performance

Conclusion and Recommendations

This study examined the impact of visual acuity on academic performance among secondary school students in Lafia. The study concluded that poor visual acuity negatively affects academic performance. Based on the study, we recommend that there should be immediate referral of children with suspected visual problem for proper investigation and treatments. Also, there should be periodic school screening programmes to identify students with poor visual acuity so that if identified and helped appropriately, it would avert poor academic performances of students.

References

- Alahmar, A.T., Ali, A. & Abudlaziz, F. (2018). The effect of visual acuity and anemia on academic performance of pharmacy students. *J Blood Disord Transfus*. Volume 9 DOI: 10.4172/2155-9864-C2-03
- America Foundation for the Blind, (2011). Statistics and sources for Professionals. Retrieved from <http://www.afb.org/section.asp?SectionID=15&DocumentID=13>

- Aransi, W.O. (2018). Impact Of Age and Gender on High School Students' Academic Performance in Economics: A Case Study Analysis. *International Journal for Innovative Research in Multidisciplinary Field*, Volume - 4, Issue – 1
- Bruce A, Fairley L, Chambers B, et al. (2015). Impact of visual acuity on developing literacy at age 4–5 years: a cohort-nested cross-sectional study. *BMJ Open* 2016;6: e010434. doi:10.1136/bmjopen-2015-010434
- Chen Al-Hong, et al. (2011). Relating Vision Status to Academic Achievement Among year -2 School Children in Malaysia. *Journal of the America optometric Association*. Volume 82 Issue 5.
- Chuka-Okosa, C.M. (2005). Refractive errors among students of a post primary institution in a rural community in south-Eastern Nigeria. *WAJM*; 24(1).
- Clinton, W.J. (1999). No challenge is more important: The United States: The president sees education as a crucial issue for America's future. *Newsweek (Special edition)*; 134:18
- College of optometrists in vision development, (2011). What is vision? College <http://www.visionanderaing.org/whatisvision08.html>.
- Dirani, M., Zhang X., Goh, L.K., Young, T.L., Lee, P., & Saw S.M. (2010). The Role of Vision in Academic School Performance. *Ophthalmic Epidemiol.* Vol 17(1): 18–24. doi:10.3109/09286580903450320.
- Dobewall, H., Lindfors, P., Karvonen, S., Koivusilta, L., Vainikainen, M.P., Hotulainen, R. & Rimpelä, A. Health and educational aspirations in adolescence: A longitudinal study in Finland. *BMC Public Health* 2019, 19, 1447. [CrossRef] [PubMed]
- Ebenuwa-Okoh, E.E. (2017). Influence of Age, Financial Status, and Gender on Academic Performance among Undergraduates. *Journal of Psychology Volume 1*, 2010 - Issue 2
- Eze, T.I., Ezenwafor, J.I. & Obi, M.N. (2015). Effects of Age and Gender on Academic Achievement of Vocational and Technical Education (VTE) Students of a Nigerian University. *Journal of Emerging Trends in Educational Research and Policy Studies*, 6(1): 96-101.
- Goldstand, S. (2005). Vision, Visual-Information processing and Academic Performance among seventh Grade Children. A more significant relationship than we thought? *America Journal of occupational therapy*, Vol 59, 337-389
- Jan, C., Li, S-M., Kang, M-T., Liu, L., Li, H., Jin, L., Qin, X., Congdon, N., & Wang, N. (2019). Association of visual acuity with educational outcomes: a prospective cohort study. *British Journal of Ophthalmology*. <https://doi.org/10.1136/bjophthalmol-2018-313294>
- John, M.M., Jackson, T. & Simiyu, C. (2015). Effect of Students' Age on Academic Motivation and Academic Performance among High School Students in Kenya. *Asian Journal of Education and e-Learning*; 3(5), 337- 342.
- Joseph, A., John, O., Eric, I., Yusuf, S. & Olubunmi, A. (2015). Effect of Gender on Students' Academic Performance in Computer Studies in Secondary Schools in New Bussa, Borgu Local Government of Niger State. *Journal of Education and Practice*, Vol.6, No.33.
- Kotingo, E.L., Obodo, D.U., Iroka, F.T., Ebeigbe, E., & Amakiri T. (2020). Effects of Reduced Visual Acuity on Academic Performance among Secondary School Students in South-South Nigeria. *International Journal of Science and Research (IJSR)* Volume 3 Issue 4.
- Maples, W.C. (2001). A comparison of visual abilities, race and socio-economic factors as predictors of academic achievement. *Journal of Behavioural Optometry*, 12:60-5.
- Momanyi, J.M., Too, J. & Simiyu, C. (2015). Effect of Students' Age on Academic Motivation and Academic Performance among High School Students in Kenya. *Asian Journal of Education and e-Learning* (ISSN: 2321 – 2454) Volume 03 – Issue 05.

- Morse, J., August, M., Bacon, J.U., et al. (2001). When parents drop out: too many harried moms and dads have been playing hooky, but schools are luring them back.
- OECD, PISA. (2019). Results (Volume III): What School Life Means for Students' Lives; PISA, OECD Publishing: Paris, France.
- Okoro, V.A., Odepemi, R.A. (2013). Visual Acuity in primary school pupils in Lagos, Nigeria. *Journal of Community Medicine and Primary Health care*. Vol 25(7):51-57.
- Orji, E.A., Archibong, E.P., Ogbonnaya, N.P., Nkpoyen, F. & Edet, A.F. (2021). Gender Influence on Academic Performance Of Nursing Students in Nigerian Universities. *Journal of Critical Reviews*, Vol 8, Issue 01.
- Shin, H.S.; Park, S.C.; Park, C.M. Relationship between accommodative and vergence dysfunctions and academic achievement for primary school children. *Ophthalmic Physiol. Opt.* 2009, 29, 615–624. [CrossRef] [PubMed]
- Snellen, H., (1862). Repeated international editions (with texts in Dutch, French, German (gothic and roman type), English, Italian, and Latin), incl. 23rd edition.
- Ubajaka, C.F., Ebenebe, U.E., Nwankwo, L.O., Egenti, N.B., Adogu, P.O., & Ejiofor B.S. (2016). Visual Acuity Status amongst Secondary School Students in South East, Nigeria. *American Journal of Medicine and Medical Sciences* Vol 6(5): 152-159 DOI: 10.5923/j.ajmms.20160605.02
- Wood, J.M., Black, A.A., Hopkins, S. & White, S.L.J. (2018). Vision and academic performance in primary school children. *Ophthalmic PhysiolOpt* Vol 38: 516–524. <https://doi.org/10.1111/opo.12582>