INTERNATIONAL JOURNAL OF CONTEMPORARY ISSUES IN INTEGRATED SCIENCE EDUCATION (IJCIISE)

ISSN: 3043-6397

IJCIISE

IJCIISE, Vol. 1, No. 1, 2025

CALL FOR PAPERS
INTERNATIONAL JOURNAL OF CONTEMPORARY ISSUES IN INTEGRATED SCIENCE EDUCATION (IJCIISE)

NOTE TO CONTRIBUTOR

International Journal of Contemporary Issues in Integrated Science Education (IJCIISE) is an annual publication of Integrated Science Educators' Association of Nigeria (ISEAN). The Journal aims at improving the quality of academic and research manuscripts submitted by scholars and researchers, through peer review process, and disseminate the publications through open access to practitioners, educators, educationists, academia, researchers, curriculum planners and policy makers. The manuscripts can have different approaches which are quantitative as well as qualitative.

IJCIISE is an annual and peer - reviewed Journal.

Manuscript submitted to IJCIISE should:

1. have a strong introduction that clearly states the organizing points of the study, acquaints the readers to what is ahead, and makes a direct link between theory, questions and research design
2. have focused literature review that clearly establishes why the topic/problem warrants discussion
3. be prepared according to the style prescribed by the 6th or 7th edition of publication manual of American Psychological Association.

Guidelines for Paper Submission

* Articles should not be longer than 15 A4 - sized pages using Time New Roman, font size of 12. Longer articles will attract additional publication fee.
* Reference style should conform to the American Psychological Association format (6th or 7th Edition). This should be arranged in alphabetical order according to the surname of the authors.
* Footnotes are not allowed.
* Manuscripts' cover should include the title of the paper, author(s) name(s), institution affiliation, contact and E-mail address (es).
* Abstract should not be more than 250 words.
* Articles can be submitted electronically via e-mail to ijisn.2023@gmail.com
* Publication fee of ₦40,000, is a condition for publication that a manuscript submitted to International Journal of Contemporary Issues in Integrated Science Education (IJCIISE) has not been published and will not be simultaneously submitted or published elsewhere.

  All fees must be paid into Integrated Science Educators' Association of Nigeria (ISEAN) Account.

Bank Name: **Polaris Bank**
Account Name: **Integrated Science Educators' Association of Nigeria**
Account Number: **1140280168**

* Submissions are published at the editor's exclusive discretion. Submission that does not conform to these guidelines may not be considered for publication.

EDITORIAL

Dear Readers,

We are excited to announce the launch of International Journal of Contemporary Issues in Integrated Science Education (IJCIISE). This Association Integrated Science Educators' Association of Nigeria (ISEAN) play a vital role in promoting scientific advancement, supporting science education, informing science policy, recognizing science excellence and fostering community engagement. The desire to float this journal was borne out of the passion to organize a yearly conference of Integrated Science by the Integrated Science Educators' Association of Nigeria, of which selected scholarly articles will be published after a thorough review. The journal dedicated to advancing knowledge and fostering dialogue within. Our mission is to publish high-quality research, innovative ideas, and critical analyses that contribute to the understanding and development of Integrated Science. At IJCIISE, we believe in the power of interdisciplinary collaboration and inclusivity. We welcome contributions from scholars, practitioners, and thought leaders worldwide, providing a space for diverse perspectives and groundbreaking work. As we embark on this journey, we invite you to submit your research, engage with our content, and join us in creating a vibrant academic community. Together, we can push the boundaries of knowledge and inspire future generations. Thank you for your support as we launch this exciting new endeavour.

This edition moves around issues that border on **"Enhancing Quality Assurance in Integrated Science in Nigeria."** It is believed that diverse contributions from scholars and researchers expressed in this edition will provoke the understanding of issues that could foster education for societal transformations on a global scale
We look forward to your contributions!

For further information on future conference activities, visit **http://ijciise.org/index.php/ijciise**

Warm regards,
Professor O. S. Agboola
President, Integrated Science Educators' Association of Nigeria (ISEAN)

TABLE OF CONTENTS

CLASSROOM INTERACTION AND STUDENTS ACADEMIC PERFORMANCE IN BASIC SCIENCE IN JUNIOR SECONDARY SCHOOLS IN ONDO STATE

Festus Oluwatobi AJALA
Adeyemi College of Education, Ondo, Nigeria
E-mail:fajala15@gmail.com

&

Theodora Olufunke BELLO, Ph.D.
E-mail:bledora@yahoo.co.uk
Institute of Education,
Obafemi Awolowo University, Ile-Ife, Nigeria

Abstract

The study investigated classroom interaction and academic performance of students in Basic Science in junior secondary school in Ondo State. The study adopted the descriptive survey research design. The population for the study comprised all junior secondary schools students in Ondo State. The sample size consisted of 18 teachers and 361 junior secondary school two (JSII) students selected from their intact classes using multistage sampling procedure. Two instruments titled "Basic Science Classroom Interaction Rating Scale" (BSCIRS) and "Basic Science Performance Test" (BSPT) were used for the study. The results showed that 38.89% of the schools in the area had low classroom interaction; 55.5% of the schools had moderate classroom interaction and 5.56% of the schools had high classroom interaction. The result also showed that there was a positive correlation between the classroom interaction and students' academic performance in Basic Science, which was statistically significant ($r = 0.133$, $n=361$, $p < 0.05$). The study concluded that classroom interaction in Basic Science classrooms in junior secondary schools in Ondo State was average and that there was relationship between classroom interaction and students' academic performance in Basic Science in Ondo State. It is recommended that teachers should take the time to build positive relationships in the classrooms among the students so that students will be able to develop the desire for success.

Keywords*:* Classroom, Interaction, Academic Performance, Basic Science, Student

Introduction

Science education is the foundations for sustainable development by protecting human societies from ignorance, illiteracy, disease and poverty. For any nation to experience economic development there must be strong, stimulating growth in the teaching and learning of science (Victor, Nafisat & Olufunke, 2023, pp. 249). Science has been defined as a systemic enterprise of gathering knowledge

about the world, organizing and condensing that knowledge into testable laws and theories (Kalu-Uche& Ogbonna, 2021, pp. 14). Also, Mulemwa (2016) said that the fast advancements in science and technology and how much the world relies on them in all aspects of life make it important for every society and country to have them. If they don't, they risk being left behind by the rest of the world. This means that in order for someone to have a good understanding of science and be able to handle the challenges of life in their community, they need to complete a well-organized, monitored, and implemented science program. For Nigeria to realize accelerated development in this 21st century, there is needs for qualitative and quantitative science education in our schools especially in senior secondary schools.

Over the last two decades, there have been repeated calls for reforms and innovations aimed at improving Science Education in Nigeria. Agboola and Olajide (2015) suggested that there are issues in science Education in Nigeria that needs to be improved upon. Among these issues are poor academic performance and students' attitude in science subjects coupled with the low educational standard in the country are parts of the major reasons why most students shy away from the study of science. This negative attitude has encouraged poor performance and low participation of students in the higher science subjects like physics, chemistry and biology. All these problems mentioned above have been conclusively blamed on basic science and its teaching (Animola & Bello, 2019).

Academic achievement is a term used for students that reflects how they are doing in their studies and classes. Mohammed, Ali, Shayibu and Abubakar (2021) stated that poor academic performance in children in a learning situation refers to one who fails to attain a set standard of performance in a given evaluation exercise such as test, examination or series of continuous assessment. This means a candidate who scores less or below a given standard is regarded as poor performing academically. In general, the term poor academic performance is a familiar phenomenon and a common academic problem of students. The level to which a student performs on a given set of multiple measures of academic growth can be defined as student achievement (Finch, 2015). Student achievement is the main goal of schooling. If student achievement were not important, then there would be less reason for school. Schools intrinsically exist for the purpose of student achievement, among others, with every teacher action taken, school policy written, and high stakes examination administered existing for this purpose. There is no clear cut recipe for a teacher to have every student in his class succeed academically. Student achievement is a capricious entity that is influenced by an endless list of factors, both internal to the school and external. The teacher only has control of those factors residing in his classroom.

However, Basic science is one of the core subjects listed in the National Policy on Education (2014) for Junior Secondary Schools in Nigeria. It is a basic subject that lays the foundation for further study of sciences in the Senior Secondary school level. Basic science, just as the name implies is the foundational aspect of science education that deals with inculcating of basic knowledge needed to understand

science. Basic science is taught at the Basic schools which comprises of classes from Basic one (Primary one) to Basic nine (JSS 3). No nation can advance higher in science and technology without the proper foundation in Basic science. It is an incontestable fact from historical and research evidences that advancement in science and technologies have their roots in Basic science, hence, Basic science is considered as backbone of any scientific and technological undertakings. Many factors have been identified to be responsible for the consistent poor learning outcomes in Basic Science in Nigerian junior secondary schools and among the student-related factors are peer influence, poor background in Basic Science in lower classes, students' level of participation in Basic science lessons and students' attitude towards learning Basic science (Animola & Bello, 2019). Among the student-related factors, students' level of interaction with teacher, fellow students and content is very important since teaching and learning processes are all about interaction.

An important component that can increase students' academic success is the relationship between the teacher and the students in the classroom. According to Thurmond andWambach,(2004) defined interaction as the learner's engagement with the course content, other learners, the instructor and the technological medium used in the course. Neslihas and Mustafa (2016), in their own view, defined classroom interaction as a technique consisting of objective and systematic observation of classroom events for study of the teacher's classroom behaviour and process of interaction going on inside the classroom. Abonyi and Ibe (2014), opined that classroom interaction entails an active encounter of teacher and the taught through verbal, gesture and resource instructionally to bring about effective communication a teaching learning process. Classroom interaction (CI) is the interaction between teacher and students and among students (Zhao, 2016). In his own view, Brown (2015) argued that interaction is the collaborative exchange of thoughts, feelings, or 1dcas between two or more people. These exchanges, they said lead to reciprocal effects. Ali (2013) said that classroom interaction is all communication including teacher-students' exchanges and all formal drills within the classroom. To Al-Rabaani (2014) see it as a process of negotiating communication problems between communicators.

Teacher-Student Classroom Interaction (TSCI) is a type of classroom interaction occurs between teacher and learners. It may be between the teacher and individual learner or a group of learners. Communication flows from the teacher to the learner or learners and also from the individual learner or a group of learners to the teacher. It is a simple form of classroom interaction. Gess-Newsome (2013) explained that interaction occurs in the classroom when the instructors attempt to present subject contents, motivate, evaluate and even provide affective support to learners. Presentation may be in form of explanation, demonstration, experimentation, calculation, illustration, dramatization or motivation. Teacher-learner interaction may be one directional, especially from teacher to learner if the teacher fails to involve or engage learners with classroom activities, whereby the teacher takes it upon him/herself to perform the majority of classroom activities,

leaving the students as passive learners and the teachers as the only repertoire of knowledge. Students have only little participation in the classroom activities, especially in the area of taking notes, asking few questions for clarifications, giving feedback to teachers to assure him/her of whether they understand the subject matter or not. This type of classroom interaction tends towards traditional classroom which uses traditional methods of teaching.

Student-Student Classroom Interaction (SSCI) is a category of classroom interaction includes that of learner and a peer or learner and a group or the learner (Lap & Thy, 2017). Learner-learner interaction is considered as the "communication between and among peers with or without the teacher present" (Viriyavejakul, 2020). There is more cooperation among learners when they work together, share ideas, contribute to learning of class members, give feedback, ask and answer fellow learner's questions, assist mates with their learning difficulties and so on. The level of interaction among learners seems to be very high when teacher is not involved because they may not fear being blamed or flogged for giving wrong responses and their mates may not crucify them for asking questions that seem foolish to teacher. Some learners do not feel comfortable facing crowd, so when they are in small groups, the phobia for crowd may disappear and participation in classroom may increase tremendously. So learners feel freer with their mates and therefore, learning may take place more effectively in this case. Teacher has significant role to play in learner-learner classroom interaction setting. The role will be that of coordinator and moderator. Peer tutoring and cooperative learning are teaching strategies that may enhance-learner interaction in classrooms. Peer tutoring is an instructional strategy that consists of pairing students together to learn or practice an academic task. It can also be regarded as the process between two or more students in a group where one of the students acts as a tutor for the other group-mate(s) (Ogundola, 2017).

Success of Basic Science teaching and learning depends largely on the efficiency of the teacher since the teacher, with their knowledge domains, is expected to facilitate knowledge acquisition among students. Hence, the nature of interaction that occurs between teacher and students, student and students and student and learning content adds to both the teacher related and students related factors. Previous studies identified poor teaching strategies, inadequate qualified teachers, unfavourable school environment, lack of instructional materials and availability of some perceived difficult topics in Basic Science curriculum among other factors responsible for students' poor performance in the subject (Agbidye, 2015; Funtua, 2015; Laleye, 2018). Research studies had proffered solutions with a view to solving students' learning problems in Basic Science yet, students' poor performance still abound in Basic Science examinations. Hence, among all the factors responsible for student's poor learning outcomes in junior secondary school Basic Science are teacher-related and student-related factors which have been worked on. Previous studies have focused on teacher-learner type while they neglected student-student and student-content interactions and learning outcomes, hence this study. There is need to investigate the classroom interaction levels on students' academic

performance in Basic science in junior secondary schools in Ondo State.

Objectives of the Study

Two objectives of the study are:

(a) determine the levels of classroom interaction that exist in Basic Science classroom in junior secondary schools in Ondo State; and

(b) examine the influence of classroom interaction on students' academic performance in Basic Science in junior secondary school Science in Ondo State.

Research Question

One research question was raised to guide the study;

(a) What are the levels of classroom interaction that exist in Basic Science classroom in junior secondary schools in Ondo State?

Hypothesis

One hypothesis was formulated to guide the study;

H_o1: There is no significant influence of classroom interaction levels on students' academic performance in Basic Science.

Methodology

The study adopted the descriptive survey research design. The research design is a type that describes and presents objects and variables under study as they are seen without manipulating anyone in the form of introducing any kind of intervention. The population of the study comprised all the Junior Secondary School Two (JSS II) students and their Basic Science teachers in Ondo State. The sample consisted of (18) Basic Science teachers and (361) junior secondary School Two (JSS II) students in their intact classes in Ondo State. The sample was selected using multistage sampling procedure. All the three senatorial districts in the state were selected. Three LGAs were selected from each senatorial district using simple random sampling technique to make nine LGAs. Two public junior secondary schools were selected from each of the LGAs by using simple random sampling technique to make eighteen (18) public junior secondary schools. Selection of any school in a LGA meant automatic selection of the JSS II Basic Science teachers of the school and the population of a class taught by the teacher were automatic member of the sample. Eighteen (18) JSS II Basic Science teachers were selected for the study with students in their intact classes. Junior secondary school II students were used for the study based on the fact that they are in their intermediate class and not in the final junior class where the students will be preparing for their junior examinations such as Basic Education Certificate Examination (BECE).

Two research instruments used for data collection are; 'Basic Science Classroom Interaction Rating Scale' (BSCIRS) and "Basic Science Performance Test" (BSPT). The two instruments were validated at different levels. Face and

content validity were carried out by giving the instruments to the experienced Basic Science teachers and experts in Tests and Measurement to make sure the language is clear, easily understood and within the students' range of vocabularies. Based on their reaction and comments, some test items were deleted since they tested similar concepts, some reworded for clarity and a few others were included to vary the concepts the items examined. Pilot testing was carried out by administering the instruments on some JSS II students from an intact class of a co-educational secondary school selected outside the study area, but had similar characteristics as the sample schools. For BSCIRS and BSPT the instruments were administered once; Cronbach's Alpha was used to calculate the reliability coefficient of BSCIRS and Kuder-Richardson formula was use for BSPT which yielded 0.86 and 0.78 respectively. Data collected were analysed using appropriate descriptive and relevant inferential statistics. The research question was analysed using mean and standard deviation while the hypothesis was tested using correlation analysis. Significance level of 0.05 was used to test the null hypotheses.

Result

Research Question: What is the level of classroom interaction that exist in Basic Science classroom in junior secondary schools in Ondo State?

This research question was answered using mean. As it was described in research question one, the total BSCIRS score represented classroom interaction levels (student-student & student-content interactions) for each school and each score have been converted to percentage (%). The sample size for this particular analysis was 18 (n = 18).Tables 1 below display the BSIRS mean for each school.

Table 1

Descriptive analysis of classroom interaction levels that exist in Basic Science classroom in Junior Secondary Schools in Ondo State

School	Mean ($\bar{x}$)	Standard Deviation	Remark
School 1	58.70	6.03	Average
School 2	40.10	13.17	Low
School 3	54.60	13.26	Average
School 4	48.90	5.93	Low
School 5	34.00	5.35	Low
School 6	39.50	11.18	Low
School 7	42.00	8.83	Low
School 8	83.80	8.14	High
School 9	69.30	16.68	Average
School 10	70.40	14.17	Average
School 11	68.10	8.88	Average

School	Mean ($\bar{x}$)	Standard Deviation	Remark
School 12	49.80	24.33	Low
School 13	53.40	13.63	Average
School 14	56.20	9.18	Average
School 15	56.20	9.88	Average
School 16	55.90	15.73	Average
School 17	59.60	8.00	Average
School 18	46.00	15.19	Low

80> High; 50-79 Average; <50 Low

Student BSCIRS mean value of their responses were evaluated based on the following range: Low interaction was 20 to 50; Average interaction was 51 to 80; High interaction was 81 to 100.

The result in table 1 showed the descriptive analysis of classroom interaction levels that exist in Basic Science classroom in junior secondary schools in Ondo State. It can be observed that, of the 38.89% or 7 schools' classrooms rated their interactions as low; while 55.56% or 10 schools' classrooms that rated their interactions as average and 5.56% or 1 school classroom that rated the interactions as high. The overall rating of these classroom interaction levels showed that they are average. In order words, the classroom interaction level in Basic Science classroom in junior secondary schools in Ondo State was average.

Testing of hypothesis

H_o2: There is no significant influence of classroom interaction level on students' academic performance in Basic Science.

This hypothesis was tested using a Pearson correlation. As was described in research question one, the total BSCIRS score represented classroom interaction and the students' Basic Science scores were used to represent academic performance. Pearson correlations are calculated in terms of bivariate pairs, analysis was restricted to only students who had a total score for both variables. The sample size for this particular analysis was 361 (n = 361). The total BSCIRS scores and their performance distribution are presented in Table 2 below.

Table 2

Pearson correlation of the relationship of between classroom interaction and students' academic performance in Basic Science

Variable	n	Mean	S.D	r	Sig.(2-tailed)
Classroom Interaction	361	54.61	22.33	0.133*	.011
Academic Performance	361	56.24	17.02		

(r = 0.133, *p < 0.05)

Results in Table 2 showed the relationship between classroom interaction level and students' academic performance in Basic Science in Ondo State. There was a positive correlation between the classroom interaction level and students' academic performance in Basic Science, which was statistically significant ($r = 0.133$, $n=361$, $p < 0.05$). Thus, the null hypothesis that states that there is no significant influence of classroom interaction levelon students' academic performance in Basic Science in Ondo State is hereby rejected.

Discussion of Findings

The result of the overall rating of these classrooms interaction levels showed that the classroom interaction level in Basic Science classrooms in junior secondary schools in Ondo State was average. This result supported the findings of Nair and Patil (2012), who submitted that there was good interaction between students in discussion forums and course messages in sharing ideas during lesson. However, this result negated the result of Zhao (2016), who reported a quantitative study conducted on students' turn-getting behaviour and finds that her Asian learners take less turns than the others and have different "bidding" patterns in comparison with the non-Asians in the classroom.

Lastly, the results of hypothesis showed that there was a positive correlation between classroom interaction level and students' academic performance in Basic Science in Ondo State. It can be inferred from this result that close interaction between student-student and student-content in classrooms encouraged students to improve their knowledge and skills by using a variety of techniques of learning and materials in diversity of activities. The result agreed with Oloyede, Adebowale and Ojo (2012), who examined classroom interaction using cooperative interaction strategy and the result showed that students' learning outcomes are better promoted by the cooperative strategy, but rather minimally, by individualistic and conventional strategies of teaching Mathematics. The finding was also in uniformity with Ogot, Micah and Mary (2020), who reported significant relationship between student-student academic interaction and academic achievement. Lastly, the finding supported Oviawe (2020), who revealed that there was significant effect of student-interaction patterns on students mean performance score in Basic Technology.

Conclusion

The study concluded that the classroom interaction level in Basic Science classrooms in junior secondary schools in Ondo State was average and there was a significant relationship between classroom interaction and students' academic performance in Basic Science.

Recommendations

Based on the findings of this study, the following recommendations were made:

Teachers should be provided with the appropriate resources and assistance to meet

the needs of their students beyond academic instruction.

Teachers should take the time to build positive relationships in the classrooms among the students so that students will be able to develop the desire for success.

Schools head should try to identify the forces at play within a child's life and provide a support system to positively interact with these forces for his or her success in school.

The study recommended that those in charge of Curriculum Development should develop a curriculum or teaching methods that seeks to improve students' academic interaction for better academic achievement.

References

Abonyi, O. S & Ibe E. (2014). Effects of exposure to constructivist instruction on interest of male and female science students. *International Journey of Scientific and Engineering Research*, *5*(2), 1558-1561.

Adesoji, F. A., & Idika, M. I. (2015). Effects of e-learning cycle model and case-based learning strategy on secondary school students' learning outcomes in chemistry. *Journal of International Society for Teacher Education*, *19*(1), 7-17.

Agbidye, A. (2015). Challenges and prospects in the teaching of basic science at the upper basic level in Nigeria. *Journal of Qualitative Education*, *11*(1), 1-8.

Agboola, O. S., & Olajide, S. O. (2015). Influence of students' feedback on the quality of science teaching among undergraduates in South-West Nigerian Universities. *Journal of Emerging Trends in Educational Research and Policy Studies*, *6*(7*)*, 229-235.

Ali, S. (2013). Factors affecting academic achievement of students. *American Journal of Educational Research, 1*(8), 283 – 289.

Al-Rabaani, A. (2014). The acquisition of science process skills by Omani's pre-service social studies teachers. *European Journal of Educational Studies*, 6(*1*), 13-19.

Animola, O. V., & Bello, T. O. (2019). Comparative effectiveness of mastery and peer-to-peer learning strategies in improving junior secondary students' learning outcomes in basic science. *Asian Journal of Advanced Research and Reports*, *3*(4), 1-12.

Brown, W., J. (2015). Examining four processes of audience involvement with media personae: Transportation, para social interaction, identification, and worship. *Communication Theory*, *25*(3), 259-283. https://doi.org/10.1111/comt.12053

Finch, S. T. (2015). *Beyond instruction: measuring academic acheivement through use of instructional models* (Doctoral dissertation, Capella University).

Funtua, I. A. (2015). The impact of multi-grade teaching approach in teaching of basic science. *International Journal of Social Sciences*, *1*(1), 1252-1260.

Gess-Newsome, J. (2013). Pedagogical content knowledge. In J. Hattie, & EM, Anderman (Eds.) *International Guide to Student Achievement* (pp. 27-43). Routledge.

Kalu-Uche, N., & Ogbonna, N. G. (2021). Effect of peer tutoring instructional strategy on secondary school slow learners' academic achievement and retention in biology. *Rivers State University Journal of Education*, *24*(1), 13-24.

Laleye, A. M. (2018). Effects of a computer-programmed instructional strategy on basic science students' learning outcome in two instructional settings in Ondo State, Nigeria. *Turkish Online*, 144.

Lap, T. Q. & Thy, H. V. U. (2017). EFL Teachers' challenges in maximizing classroom interaction. *Open Journal Systems*, *5*(4) 29-72. https://doi.org/10.22158/selt.v5n4p695

Mohammed, L. B., Ali, G. K., Shayibu, G. & Abubakar, U. (2021). Influence of socio-educational factors on students' academic performance in some government secondary schools in Yobe State, Nigeria. *IOSR Journal of Humanities and Social Science*, *26*(04), 40-44.

Moore, C. D. (2005). Three types of interaction. *American Journal of Distance Education*, *3*(2), 1-7.

Mulenwa C. T. (2016). The challenge of providing quality school science in Africa. In M .A. G. Akale (Ed.), 43rd Annual Conference. *Proceedings of Stan on Science*, *Technology and Mathematics Education for Sustainable Development in Africa*.

Nair, R. & Patil, R. (2012). A study on the impact of learning management systems on students of a University college in Sultanate of Oman. *International Journal on Curriculum Studies*, *2*(3), 34-42.

Neslihas, F. & Mustafa, E. R. (2016). The effects of student-content interaction on academic performance in distance-learning courses. *International Journal on New Trends in Education and their Implications, 7*(3), 60 – 68.

Nwagbo, C. R. & Ovuve, A. D. (2011). Teachers 'knowledge of the content and activities in the new basic science curriculum: Implications for the new science teacher. *Nigerian Journal of Curriculum Studies*, *18* (1), 194-200.

Ogot, A. W., Micah, C. & Mary, K. (2020). Relationship between students-student academic interactions and academic achievement in public secondary schools in Nakuru County, Kenya. *Journal of Education and Practice*, *11*(16). https://doi.org/10.7176/JEP/11-16-06

Ogundola, P. (2017). Effects of peer tutoring strategy on academic achievement of senior secondary school students in technical drawing in Nigeria. *British Journal of Education, Society &Behavioural Science*, *19*(1), 1-10.

Okebukola, P. A. (2002). Beyond the stereotypes to new trajectories in science teaching. *Special Lecture Presentation at the 43th Annual Conference of STAN and CASTME*.

Oloyede, E. O., Adebowale, O. F. & Ojo, A. A. (2012). The effects of competitive, cooperative and individualistic classroom interaction models on learning outcomes in Mathematics in Nigerian senior secondary schools. *International Scholarly Research Network ISRN Education*, 1-8.

https://doi.org/10.5402/2012/263891
Oviawe, J. I. (2020). Effect of student-interaction patterns on students' academic performance in basic technology in Edo State secondary schools. *Journal of Technology and Operations Management*, *15*(1), 1-14. https://doi.org/10.32890/jtom
Thurmond, V., & Wambach, K. (2004). Understanding interactions in distance education: A review of the literature. *International Journal of Instructional Technology and Distance Learning*, *1*(1), np.
Victor, A. O., Nafisat, O. O., & Olufunke, B. T. (2023). Influence of parents 'variables on lower primary school pupils' academic achievement in basic science and technology in Ona Ara local government area, Oyo state. *Ife Journal of Theory and Research in Education*, *24*, 248-261.
Viriyavejakul, C. (2020). Adaptive technologies based on learning styles for distance education. In *INTED2020 Proceedings* (pp. 4703-4707). IATED.
Zhao, C. M. (2016). Factors influencing student participation in classroom interaction. *Higher Education of Social Science*, *11*(3), 20-23. http://dx.doi.org/10.3968/8804