UNIJERPS
Unizik Journal of Educational Research and Policy Studies VOL.19 (3);
January-June, 2025 https://unijerps.org
2023 Impact Factor: **6.834;** 2022 ***Impact Factor***: 5.156; ***2021 Impact Factor: 5.641;***
2020 Impact Factor: 5.355. *Indexing and Impact Factor URL: http://sjifactor.com/passport.php?id=21363*

EFFECT OF COOPERATIVE LEARNING STRATEGY ON STUDENTS' ACHIEVEMENT IN BIOLOGY IN ANAMBRA STATE

Amaka Angela Ekwesianya (Ph.D)
Department of Vocational Education,
Chukwuemeka Odumegwu Ojukwu University,
Igbariam Campus, Anambra State, Nigeria
E-Mail: amakaangela70@gmail.com

ABSTRACT

This study examined the effect of cooperative learning on secondary school students' achievement in Biology in Aguata LGA of Anambra State. The purpose of the study was to investigate the effects of cooperative learning on students' achievement in Biology and the study had two specific objectives. The concept of cooperative learning, achievement and gender were explained. Two research questions guided the study as well as two null hypotheses tested at 0.05 level of significance. The quasi-experimental research design was used, specifically the pre-test posttest non-randomized control group design. A sample of 118 Senior Secondary School two (SS2) Biology students from Aguata LGA was used in the study. The instruments for data collection was Biology Achievement Test (BAT) validated by three experts and considered valid. The reliability of the instrument was established using Kudder-Richardson formula 20 which yielded coefficient of internal consistency of 0.92. Teachers were trained as research assistants and they administered the treatment on the students using the designed lesson plans. The method of data collection was by administering the BAT as pretest and posttest. The data obtained were analyzed using mean gain and Analysis of Covariance (ANCOVA). The results revealed among others that there was a significant difference between the mean achievement of students in biology in the cooperative learning group and conventional method in favour of cooperative learning. There were no significant differences in the mean achievement scores of male and female students in the cooperative learning among other findings. The study recommended among others that biology teachers should adopt cooperative learning to involve students in the learning process actively and make them take more responsibility for their own learning.

Keywords: Effectiveness, Cooperative Learning, Achievement and Biology

Introduction

Education is the bedrock of any nation's development and is central to all aspect of any nation's science. It is the most powerful instrument devised by man for his own improvement. Education, according to Onyekwelu, (2021), Abonyi, (2021), Azubuike, (2025), Enwezor and Chukwunonye, (2022) and Ucheagwu-Okoye, (2025) can be regarded as instrument for effecting human learning,

transformation and capacity development. It is the total process of human learning by which knowledge is impacted, faculties trained and skills developed. Thus, it is a means through which man acquires learning and is molded to fit into the society. The major aim of education is to provide individuals with the relevant knowledge, skills, attitudes and ideas to enable them live as effective citizens in the society.

Every educational system is developed and structured according to many diverse and distinct needs and demands of the society that established it. However, education is constantly changing and adapting itself to new demands and circumstances. In the National Policy on Education, the Federal Government of Nigeria (FGN, 2013) had continued to update her educational system to meet up with various educational challenges. The FGN properly placed a significant emphasis on the importance of students acquiring and developing of appropriate skills as equipment for them to live in and contribute positively to the society. Moreover, senior secondary education in Nigeria, on its part, aims at equipping students to live effectively in our modern age of science and technology, hence the inclusion of biology education in the secondary school curriculum in Nigeria.

The importance of biology in the society are many and cannot be over-emphasized. This has been buttressed by Ezeamama, Ofozoba (2023) and Ibe, (2022), Okoye, and Ezeaku, (2025), Ugwaka, and Igbokwe (2020) and Okaforcha and Okeke, (2025), who stated that the study of biology serves a useful purpose in modern life. It helps in the right type of treatment to choose for many diseases and ailment. FRN (2013) emphasized the teaching of biology in Nigerian schools as it is linked to the philosophy of education aimed at; Inculcating national consciousness and national unity; inculcating the right type of attitude for the survival of the individual and the Nigerian society.

Important reasons for studying biology are to understand how cells and organisms work. It involves the study of life and it is very important as it tells us about the natural world. Biology tells us about our body, helping us to develop cures and treatments for many diseases. It also tells us about the bodies of other animals and it can provide clinical treatment for farm animals and also pets (Ogbaga, 2016). In addition to this, Okoro (2011) opined that biology also tells us about plants and how they can be beneficial to human life. He went further to buttress that biology gives us a method to classify animals and help us understand animals. It also tells us do's and don’ts for our planet. It gives us a thorough picture of human body and the organisms inside us, also about the metabolism and other processes inside the human body. Biology also tells us

about the behavioral acts of humans and animals.

Biology as a science helps human life in many ways. It helps in increasing production of food, combating diseases and also aids in protecting and conserving our environment. The advances in the field of biology have resulted in high standard of living in the field of food and health. Okaforcha and Iloka, (2025), Ofozoba, (2020), Ibe, (2019), Anushiem, (2017), Ekwesianya, (2022), Nwankwo and Okoye, (2022) and Osegbue, (2022) averred that production of plants has been increased by improving the varieties and development of high-yield and diseases resistant varieties of plants and animals that are used as food.

Biology is a natural science that studies the living world. It is a prerequisite subject for many fields of learning that contributes immensely to the technological growth of the nation. A lot of reasons are borne in mind while studying biology. These include among others, the understanding of oneself and the environment surrounding us, appreciation of nature as well as pollution control. Sound theoretical and practical knowledge of biology according to Johnson (2005) is very necessary for proper management of natural resources and maintenance of good healthy living habits. Thus, biology and its study are necessary not only for students but the whole of human populace (Okaforcha and Okeke, 2020; Nwankwo, and Ezeibe, 2021).

Despite the importance and popularity of biology among Nigerian students, Osuafor & Okonkwo, 2013, Abonyi, (2022), Onyekwelu, (2024) and Obumse and Chinwe, (2021) argued that it is very disappointing to note that students' performance in the subject at both internal and external examinations has remained consistently poor. Okoro (2011), Nwabachili, Iloka and Ucheagwu-Okoye, (2022) and Abonyi, (2020) asserted that for some years the percentage of students who obtained credit pass in biology at West African Senior School Certificate Examination (WASSCE) in Nigeria has been low and their performance is poor. In Aguata Education Zone in Anambra State, statistics from May/June 2014-2018 for senior secondary certificate examination showed the percentage of candidates who passed WASSCE at credit level and above in biology as follows; 59.7% in 2014, 32.9% in 2015, 47.3% in 2016, 70.8% in 2017 and 44.6% in 2018 (Source: Planning, Research, and Statistics Department, Post-primary Education Board, Aguata, 2018). The trend although showed some improvement in the subject, but the performance of students fluctuates with a decline in 2015, 2016 and 2018.

This evidence indicates that secondary school students' academic achievement in Biology is still not at its best. If the grades that students get at the end of a course of study continue to either fluctuate or sometimes decline, the implication is that Nigeria may have inconsistent supply of manpower or facility

for teaching science and technology related disciplines. This may affect Nigeria's vision to become one of the 20 industrialized nations in the world by year 2025. These have raised research interest in order to understand the factors responsible for fluctuations and decline in students' achievement as well as poor students' achievement and proffer solutions to them.

Many factors have been identified by researchers as being responsible for the decline and poor performance of students in biology. Some of these include; lack of teachers, lack of educational facilities like laboratories, overloaded syllabuses, laziness, poor attitude and lack of interest on the part of the students, large class size, family/home background of the students (Osuafor & Okonkwo, 2013; Nwankwo, 2022; Obumse, 2022; Nonyem and Chimaa, 2020). Apart from these factors, poor teaching methods adopted by teachers at senior secondary school level in Nigeria have also been identified as one of the major factors contributing to poor performance of students in biology (Wanbugu, et al, 2013; Anthony, 2014; Adinna and Onyekwelu, 2021; Okaforcha, 2021). If students are not happy with the way biology is taught, they may show disinterest and negative attitudes in and towards biology and its teaching and this would affect their achievement in biology.

Academic achievements respond to a series of variables like gender, school location, teaching methods and teacher's characteristics. A study by Efanga (2014) revealed that students taught certain concepts in technology package achieved more academically than their counterparts taught same concepts using conventional method of instruction. When a concept is taught with a teaching method suited for it, learning increases. Whereas wrong method of instruction yields poor academic achievement of the learner. That is to say, every career area has teaching methods that are best suited for instruction and for a good performance in examinations. Examinations administered by most examination bodies such as WAEC and NECO are cumulative examinations. For instance, WAEC examination which the students take at SSIII educational level is a test on all that the students were taught from SS I to SS III. This implies that the result of such examinations reveals the students' academic performance. Hence poor performance.

Another issue on the poor achievement in biology is the notion of some male students that biology is a subject for the females and not for the males. Some research works have shown contradictory evidence in student's academic achievement in science due to gender (Ogbaga, 2016). Ezeaku (2019), Osegbue, (2019); Okeke, Okaforcha and Ekwesianya, (2019) and Okoye, (2021) found that there was no statistically significant difference in the achievement of male and female students in biology and biology respectively. The teaching methods adopted for teaching biology have been observed to be gender biased. Therefore, one can emphatically state that by the virtue of the importance of biology as a school subject,

there is need for its effective teaching and learning to bring about good achievement and attitude in both male and female students.

The Federal Republic of Nigeria (FRN), in the National Policy on Education stipulates that, biology education should develop in the child well defined abilities and values such as the spirit of inquiry, creativity, objectivity, the courage to question, and an aesthetic sensibility (FRN, 2013). The policy further stated that biology is designed to enable the learner to acquire problem-solving and decision-making skills and to discover the relationship of science with health, agriculture, industry and other aspects of daily life (FRN, 2013). To be able to achieve these objectives requires proper conceptualization of biology concepts. This would require teaching and learning approaches that could make students practice biology knowledge gained, achieve good grades in biology and apply the learned concepts in their daily lives as scientists to be. Two methods that come early to mind of the researcher at this point are cooperative and individualized methods since they are student centred.

Cooperative learning is an aspect of learning which represents a shift away from the typical teacher-centred learning. Teachers who use cooperative learning approaches tend to think of themselves less as expert transmitters of knowledge to students, and more as expert designers of intellectual experiences for students- as coaches or midwives of a more emergent learning process. It is defined as the instructional use of small groups so that students' work together to maximize their own and each other's learning (Rose, 2014). Techniques involved in cooperative learning include: Think-pair-share, Jigsaw, Jigsaw II, Reserve jigsaw, Inside-outside circle and Reciprocal teaching (Schul, 2011). Of all these strategies, studies indicate that the use of Jigsaw strategy increases positive educational outcomes (Sahin, 2010; Enwezor, 2021; Okeke, 2022; Okeke and Okaforcha, 2025). This study will make use of think-pair-share strategy. According to Ethelmary, Nwankwo and Aroh, (2019), Osegbue, (2021), Ekwesianya, (2025), Ezeaku and Okoye, (2025), and Okechukwu, (2025) Jigsaw is a cooperative learning strategy that enables each student of a "home" group to specialize in one aspect of a learning unit. Students meet with members from other groups who are assigned the same task and after mastering the materials, return to the "home" group to teach this material to the group members. Jigsaw can be used whenever materials are segmented into separate components. Each group member becomes an expert on a different concept or procedure and teaches it to the group (Iloka, (2025). Just like jigsaw puzzle, each piece (student part) is essential for the completion and full understanding of the final product. Therefore, each student is essential for the understanding of the whole concept being taught. According to Aronson, one of the advantages of jigsaw strategy is that students perform the challenging and engaging tasks in their experts' groups with enthusiasm since they know they are the only ones with that piece of information when they move to

their respective groups. Students who tutor each other must develop a clear idea of the concept they are presenting and orally communicate it to their partners (Sahin, 2010).

Research-based evidence seem to show that cooperative learning improves students' learning outcome and educators have recognized cooperative learning as a beneficial teaching-learning technique for different subjects (Zakaria, et al, 2013). Cooperative learning was reported by Wayne (2013) to have positive effects on academic achievement when students are accountable only to themselves, when they are accountable to both themselves and their group, and when students are solely accountable to their group. Rose (2014), Anushiem, (2023), Azubuike, (2024), Okeke, Okaforcha and Ekwesianya, (2019), Nwakoby, (2025), Nwakoby and Iloka, (2025) and Enwezor and Obi, (2022) further revealed that cooperative learning had positive effect on students' mathematics achievement.

The conventional method involves other methods used by the teacher in lesson delivery which are teacher-centered. Typical examples are the lecture method and chalk talk method. Lecture method is a teacher-centred approach to teaching and learning in which the teacher is seen as an authority, dispensing knowledge to students who contribute little or nothing to the instruction. Lecture method has been criticized by Adegoke (2011) who posited that only hardworking students can benefit from it.

The classrooms in Nigeria according to Ekwesianya, Okaforcha and Okeke, (2020), Enwezor, (2021) and Ojimba, (2024) are predominantly dominated by conventional method like the lecture method of instruction which does not encourage students-students interaction. The common use of conventional method is obviously due to the fact that it is suitable for teaching a large number of students and saves a lot of time. It also requires lesser skill on the part of the teachers who use the approach. Conventional method as a teacher-centred approach makes for students' passivity and therefore leads often times to poor academic achievement in school subjects.

Cooperative learning strategy have been reported in a number of studies to bear characteristics that could improve on the students' achievement (Neboh, 2009; Rose, 2014; Zakaria, et al, 2013), they are however, not without limitations. For teachers, stepping out of the teacher-centred method and engaging students in group activity is hard work, especially when doing it for the first time. Designing group work requires a demanding yet important rethinking of the syllabus, in terms of course content and time allocation. Cooperative learning strategy hold many benefits for the students due to the nature of students' involvement. These benefits of cooperative learning strategy are accessible to both genders of the students. The findings of Muhammad (2014) and Okpala and Onocha as cited in Izuchukwu, Ugwaka, Arazu and Ezechi, (2023), indicated that achievement in biology of students

towards the subject could be influenced by some learner characteristics such as gender.

Gender is an important variable in educational research and it has continued to be an issue of concern to educators and researchers. Onyekwelu, and Adinna, (2022), Okaforcha and Okeke, (2019), Anthony, (2019) and Anushiem and Anushiem, (2023) noted in their studies that gender has impact on biology. Gender can be considered to be sexual classification into male and female. Gender issues in the context of education is referred to as the differences, both real and perceived between boys and girls and their relative achievements and opportunities (West Minister Institute of Education, 2006). Gender-related issues have attracted the attention of many researchers in biology for male and female in secondary schools. Ucheagwu-Okoye, (2025), Ojimba, (2020), Onyekwelu, (2024); Osegbue, and Nnubia, (2020) found that gender has no influence on students' achievement in biology and their attitude. Also, Okechukwu, (2025), Iloka and Nwakoby, (2025), Enwezor, and Obi, (2022), Ezeaku, (2025) in their study found no significant difference between male and female students' achievement. The influence of gender on achievement and in attitude is therefore still a controversial issue among biology researchers. The reports on gender as a group factor in students' achievement in sciences are mixed. While some findings indicated no significant effect of gender in biology achievement (Ucheagwu-Okoye, 2021; Okoye, 2025), some researchers reported significant influence of gender on academic achievement with boys having better scores than girls in the study. This study therefore sought to examine the influence of gender on the achievement of students.

These contradictive evidences in academic achievement and lack of clear trend on gender influence in the study of biology has resulted in the need to carry out a study with a view to determine the effect of cooperative learning strategy on secondary school male and female biology students' academic achievement. To this background, it is imperative to investigate effects of cooperative learning strategy on students' achievement in Biology in Anambra State.

Purpose of the Study

The purpose of this study was to examine the effects of cooperative learning method on students' achievement in Biology Anambra state. The specific objectives of the study were to find out the:

1. Mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method.
2. Mean achievement scores of male and female students taught Biology using cooperative learning method.

Research Questions

The following research questions will guide the study:

1. What are the mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method?
2. What are the mean achievement scores of male and female students taught Biology using cooperative learning method?

Hypotheses

The following null hypotheses will be tested at significant level of 0.05:

1. There is no significant difference between the mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method.
2. There is no significant difference between the mean achievement scores of male and female students taught Biology using cooperative learning method.

Method

The quasi-experimental design was used, specifically the pre-test posttest non-randomized control group design. A sample of 118 Senior Secondary School two (SS2) Biology students from Aguata LGA was used in the study. The instrument for data collection which is Biology Achievement Test (BAT) was validated by one lecturer in science education, one lecturer in measurement and evaluation, Nnamdi Azikiwe University, Awka, and one experienced biology teacher in British Spring College, Awka. The reliability of the instrument was established using Kudder-Richardson formula 20 which yielded coefficient of internal consistency of 0.92. Teachers were trained as research assistants and they administered the treatment on the students using the designed lesson plans. The method of data collection was by administering the BAT as pretest and posttest. The data obtained were analyzed using mean gain to answer the research questions and Analysis of Covariance (ANCOVA) to test the null hypotheses at 0.05 level of significance.

Results

Research Questions 1: What is the mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method?

Table 1: The Mean Achievement Scores of Students taught Biology using Cooperative Learning Method and those taught with Conventional Lecture Method

Source of variation	N	Pretest Mean	Posttest mean	Gain Mean	Pretest SD	Posttest SD	Remark
Cooperative Learning	38	29.47	80.92	51.45	10.95	12.78	Effective
Conventional Lecture method	41	27.07	62.80	35.74	11.29	14.14	

Table 1 reveals that the students taught biology with cooperative learning had pretest mean score of 29.47 and posttest mean score of 80.92 with gained mean 51.45 in biology,

while those in the control group taught with conventional lecture method had pretest mean score of 27.07 and posttest mean score of 62.81 with gained mean 35.74. With posttest mean score of 51.45, Cooperative learning method is effective in enhancing students' achievement in biology. Table 1 show from the standard deviation scores that the spread of scores increased in cooperative method in moving from the pretest to the posttest with the conventional method group having the highest standard deviation.

Research Questions 2: What is the mean achievement scores of male and female students taught Biology using cooperative learning method and those taught with conventional lecture method?

Table 2: Mean Achievement Scores of Male and Female Students taught Biology using Cooperative Learning Method and those taught with Conventional Lecture Method

Source of variation	Gender	N	Pretest Mean	Posttest mean	Gain Mean	Pretest SD	Posttest SD	Remark
Cooperative Learning	Male	18	29.17	81.39	52.22	10.06	11.61	Effective
	Female	20	29.75	80.50	50.75	11.97	14.04	Effective

Table 2 indicates that cooperative learning is effective in enhancing both male and female students' achievements in biology. Table 2 also shows from the standard deviation scores that the spread of scores increased in both male and female in moving from the pretest to the posttest with the females having the highest spread of scores.

Hypothesis 1: There is no significant difference between the mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method.

Table 3: ANCOVA on the significant difference between the mean achievement scores of students taught Biology using cooperative learning method and those taught with conventional lecture method.

Source	SS	Df	Mean Square	F	Sig.	Decision
Corrected Model	6682.488[a]	4	1670.622			
Intercept	56664.322	1	56664.322			
Pretest	47.870	1	47.870			
Method	6310.553	1	6310.553	33.753	.000	S
Gender	46.481	1	46.481	.249	.620	NS
Method * Gender	111.647	1	111.647	.597	.442	NS
Error	13835.234	74	186.963			
Total	424600.000	79				
Corrected Total	20517.722	78				

Table 3 shows that at 0.05 level of significance, 1df numerator and 78df denominator, the calculated F is 33.753 with P-value of 0.000 which is less than 0.05. Therefore, the null hypothesis one is rejected. So, the effect of cooperative learning on the biology achievement scores of secondary school students is significant.

Hypothesis 2: There is no significant difference between the mean achievement scores of male and female students taught Biology using cooperative learning method and those taught with conventional lecture method.

Table 3 also reveals that at 0.05 level of significance, 1df numerator and 78df denominator, the calculated F is 0.249 with P-value of 0.620 which is greater than 0.05. Therefore, the null hypothesis two is accepted. So, gender had no significant influence of the achievement of the male and female students taught using cooperative learning and conventional method.

Summary of Findings

1. Cooperative learning significantly enhanced achievement in biology
2. Cooperative learning is significantly more effective than conventional lecture method in enhancing students' achievement in biology
3. The influence of gender on the achievement of students is not significant.

Discussion of Findings

The findings of the study revealed that Cooperative learning significantly improved the students' Biology achievement. The students in the Cooperative learning group had mean gain significantly higher than their counterparts in the conventional group. Cooperative learning was also more effective than individualized instruction as shown by the mean gain. This improvement in the achievement of biology students through the use of Cooperative learning can be explained from the fact that Cooperative learning increased personal, social and intellectual development, academic attainment and positive interaction among students; cooperative instructions engage students in group and thereby increase learning, education, knowledge and skills (Brown & Ciuffetelli, 2009). The improved achievement can be further explained in the views of Ke and Grabowski (2007), Enwezor, and Chukwunonye, (2021) and Ugwaka and Igbokwe (2023) who reported that Cooperative instruction enabled students of different levels and ability to use available learning activities and those known to improve their understanding in biology owing to the interaction among students in small teams. Thus, in their interaction, students who understand a particular concept in the subject of study help the others to understand the same. In this exchange of knowledge, all students within a group with time may come to master the subject matter content under study, achieve the required

learning objectives and improve their achievements.

Conclusion

The findings of this study revealed a significant positive effect of Cooperative learning on students' achievement in biology. This led to the conclusion that Cooperative learning method significantly and positively enhanced the students' achievement in biology. Also, there was no significant differences in the mean achievements of male and female students taught using Cooperative learning method. Thus, the method significantly improved the students' biology achievement uniformly regardless of their gender. More so, there are no significant interaction effects of gender and teaching method as measured from the Biology achievement test.

Recommendations

The following recommendations are made in the light of the above findings:

1. Biology teachers should adopt Cooperative learning strategies to involve students in the learning process actively and make them take more responsibility for their own learning.
2. The school administrators should provide facilities such as internets, library materials and well-equipped laboratories so that Biologystudents could have enough educational resources in the course of cooperative learning.
3. Frequent training on how to use Cooperative learning effectively in teaching and learning biology should be organized for Biology teachers by the government and stakeholders in education. Such training should be supervised and evaluated to make sure that Biology teachers have mastered the strategies for use in the classroom.

REFERENCES

Abonyi, A. U. (2022). Organ Harvesting: A Critical Review of Nigerian Law and Lessons from International Instruments. *IJOCLLEP*, *4*, 45.

Abonyi, A. U. (2022). Sustaining a Claim or Counterclaim for a Declaration of Title to Land: A Review of David Nwankwo Egemonye v Peter Obichukwu Egemonye. *IRLJ*, *4*, 160.

Abonyi, A. U. (2022). The Constitutionality of RUGA as a Land Policy in Nigeria. *AJLHR*, *6*, 52.

Abonyi, A. U. (2023). The Protection of Prisoners of War under International Humanitarian Law. *LASJURE*, *4*, 115.

Adeyemi, B. A. (2008). Effects of cooperative learning and problem-solving strategies on junior secondary school students' achievement in social studies. *Electronic Journal of Research in Educational Psychology*, *6*(3), 691–708.

Adinna, I. P., & Onyekwelu, R. A. (2021). Evaluation Of Supervision Related Challenges on The Implementation of National Policy on Secondary Education in Anambra State Nigeria. *Online Journal of Arts, Management and Social Sciences (OJAMSS);* 5(2), pg.272 – 281

Ahmed, M. A., & Abimbola, I. O. (2011). Influence of teaching experience and school location on biology teachers' rating of the difficult levels of nutrition concepts in Ilorin, Nigeria. *JOSTMED, 7*(2), 52- 61.

Anthony, O. C. (2014). The United States and Political Revolution in Africa: A Study of the 2011 Revolution in Egypt. Humanities and Social Sciences Review, CD-ROM.; 3(2):269–281.

Anthony, O. C. (2019). Implementation of vision 20: 2020 agricultural policy and food production in Nigeria, 2007–2015. International Journal of Research and Innovation in Social Science; *3*, 42-64.

Anushiem, M.I. & Anushiem, U.M.J. (2023). Leave to Sue a Company in Liquidation Under section 580 of Companies and Allied Matters Act 2020: Imperative for Legislative Intervention. *Frontline Bar Journal (FBJ); 1(2),* available in google scholar at http:// www. nigerianjournalsonline.com.

Anushiem, U. M. (2025). Education Law in Nigeria: Imperative for Fundamental Rights Provision. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *15*(1).

Anushiem, U. M. (2023). The intervention of finance act on taxation of non-resident companies in Nigeria: An appraisal. *Chukwuemeka Odumegwu Ojukwu University Journal of Private and Public Law*, *4*(1).

Anushiem, M. U. (2019). The Constitutionality of The Exclusive Jurisdiction of The Investments and Securities Tribunal (IST). *African Journal of Constitutional and Administrative Law*, *1*, 64-77 available in google scholar at http:// www.journals.ezenwaohaetorc.org

Anushiem, U.M.J. (2022). Intervention of Finance Act (2019) as Amended on Taxation of Dividends in Nigeria: A Legal Appraisal' *Nnamdi Azikiwe University, Journal of Commercial and Property Law*, 9 (1); available in google scholar at http:// www.journals.unizik.edu.ng

Anushiem, U.M.J. (2022). The Intervention of Finance Act on Taxation of Non-Resident Companies in Nigeria: An Appraisal', *Chukwuemeka Odumegwu Ojukwu University Journal of Private and Public Law (COOUJPPL)* 4 (1).

Anushiem, U.M.J. (2023). Appraisal of the Prospects for Taxation of Digital Economy in Nigeria', *Unizik Law Journal*, 19 (2), available on online on journals.ezenwaohaetorc.org.

Azubuike, O. R. (2024). Perceived Influence of Principal Leadership Styles on Teachers' job Performance in Public Secondary Schools in Awka South LGA. *Top Educational Review Journal;* 15(12);24-32. ttps://zapjournals.com/Journals/index.php/terj

Azubuike, O. R. (2024). Perceived Influence of Welfare Packages on Teachers Job Performance in Public Secondary Schools in Anambra State. *International Journal of Education, Research and Scientific Development;* 5(3), 1-14. https://www.ijresd.org

Azubuike, O. R. (2024). Principals' school Plant and Personnel Management Practices as Predictors of School Improvement in Secondary Schools in Anambra State.

Azubuike, O. R. (2025). Utilization Of Learning Resources for Teaching in Primary Schools in Udi LGA of Enugu State. *Irish J. Edu Pract*, *8*(01).

Durukan, E. (2011). Effects of cooperative integrated reading and composition (CIRC) technique on reading-writing skills. *Educational Research and Reviews*, *6*(1), 102–109.

Efanga, M. L. (2014). *Effect of mastery learning on the learning of chemistry*. (Unpublished Thesis). Imo State University: University Press.

Ekwesianya, A. A. (2022). Principals' school-Community Relationship Management Strategies for School Plant Maintenance in Secondary Schools in Awka Education Zone of Anambra State. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *6*(1), 191-200.

Ekwesianya, A. A. (2025). Towards Effective Integration of Artificial Intelligence in Teaching Profession in Nigeria: Issues and The Way Forward. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *14*(1).

Ekwesianya, A. A., Okaforcha, C., & Okeke, N. I. (2020). Principals' Capacity-Building Needs for Conflict Resolution in Secondary Schools in Anambra State. *International Journal of Innovative Science and Research Technology; 6 (5); 513-516.*

Enwezor, C. H. (2021). Relationship Between Principals' human Resource Management Practices and Teachers' job Satisfaction in Secondary Schools in Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *2*, 137-150.

Enwezor, C. H., & Chukwunonye, M. N. (2021). Principals' application of Code of Ethics in The Management of Examination Malpractice in Secondary Schools in Anambra State. *COOU Journal of Educational Research*, *6*(2).

Enwezor, C. H., & Obi, E. (2022). Academic Staff Work Environment and Work Orientation as Correlates of their Job Satisfaction in Colleges of Education in South East, Nigeria. *Unizik Journal of Educational Research and Policy Studies*, *11*, 81-93.

Enwezor, C. H., & Obi, E. (2022). Work Environment and Orientation of Male and Female Academic Staff as Correlates of Their Job Satisfaction in Colleges of Education in South East, Nigeria. *UNIZIK Journal of Educational Research and Policy Studies*, *10*, 168-179.

Enwezor, H. C. (2021). Perceived Impact of School Climate on Academic Performance of Secondary School Students in Onitsha North Local Government Area, Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *4*, 117-136.

Enwezor, H. C., & Chukwunonye, N. M. (2022). Employability Skills Applied by Principals for Managing Generated Revenue for Effective School Management in Anambra State, Nigeria. *The Pacific Journal of Science and Technology*, *23*(2), 66-73.

Ezeaku S. N (2019). Creative Quality of Educational Managers in functional Education as a panacea to Achieving Sustainable Development in Anambra State, Nigeria. *Journal of Education, Society and Behavioral Science* Vol. 31 (issued) (Pg 1-9).

Ezeaku, S. N. (2025). Instructional Leadership in The Era of Ai: Correlates to Open School Climate in Secondary Schools in Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *19*(1).

Ezeaku, S. N., & Okoye, A. C. (2025). Best Strategies for Ensuring a Good Organizational Climate in Secondary Schools in Anambra State. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Federal Republic of Nigeria. (2013). *National policy on education.* Abuja: NERDC Press.

Ibe, I. U. (2019). An Appraisal of The Legal and Administrative Framework for Taxation in Nigeria. *African Journal of Constitutional and Administrative Law*, *1*.

Ibe, I. U. (2022). An Analysis of The Legal Framework for The Administration of Companies Income Tax in Nigeria. *Chukwuemeka Odumegwu Ojukwu University Law Journal*, *6*(1).

Ibe, I. U. (2022). legal responses to tax evasion and avoidance in Nigeria. *Chukwuemeka odumegwu ojukwu University Journal of Private and Public Law*, *1*(1).

Iloka, P. C. (2025). Teaching Integrity: Strategies for Fostering Ethical Behavior in Students. *UNIZIK Journal of Educational Research and Policy Studies*, *19*(1).

Iloka, P. C., & Nwakoby, C. S. (2025). Examination Of the Legal Rights of Teachers: A Case Study of The Anambra State Legal Provisions. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Iloka, P. C., & Nwakoby, C. S. (2025). Safety And Security in Managing School Facilities. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Izuchukwu, V.C., K.A. Ugwaka, V. Arazu and C.U. Ezechi, 2023. Quality evaluation of commercial fish ponds in Uli, Anambra State and their health implications. *International Journal of Agricultural Research;* 18(2), 56-63.

Johnson, D.W. & Johnson R.T. (2010). Cooperation and competition: *Theory and research.* Edina, MN: Interaction Book Company.

Johnson, G. B. (2005). *Biology, Visualizing Life. New York*: Holt, Rinehort and Winston.

Ke, F. & Grabowski, B. (2007). Game playing for math learning: co-operative or not? *British Journal of Educational Technology*, *38*(2), 249-259.

Neboh, O. I. (2009). *Effect of learning activity package (lap) on students' achievement and retention in senior secondary school biology.* Unpublished Thesis. Department of Science Education Faculty of Education University of Nigeria, Nsukka.

Nneka Anthonia Obumse & Uju P. Egenti (2021). Influence of mental health status on academic achievement of public secondary school students in Anambra State. *African Journal of Educational*

Management, Teaching and Entrepreneurship Studies.

Nneka Anthonia Obumse, Uju P. Egenti (2021). Influence of psychosocial variables on campus adjustment of first-year students of Colleges of Education in Delta State, Nigeria. *Unizik Journal of Educational Research and Policy Studies.* Vol. 9. (2021).

Nwakoby, C. S. (2025). Leadership In Educational Management. *UNIZIK Journal of Educational Research and Policy Studies*, *19*(1).

Nwakoby, C. S., & Iloka, P. C. (2025). Examining Education Law of Torts in Public Secondary Schools in Anambra State. *UNIZIK Journal of Educational Laws and Leadership Studies*, *1*(1).

Nwakoby, C. S., & Iloka, P. C. (2025). Regulatory Challenges in Implementing Digital Education in Anambra State for Sustainable Development. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Nwankwo, A. A. (2022). Green business strategies and performance of breweries in South-East Nigeria. *International Journal of Innovative Social Sciences & Humanities Research*, *10*(1), 127-138.

Nwankwo, I. N. (2020). Assessment of principals' implementation of education management information systems in staff personnel management in secondary schools in South-East states of Nigeria. *International Journal of Innovative Science and Research Technology; 5 (10)*, 398 - 404.

Nwankwo, I. N. (2022). Management practices for controlling fund wastages and misappropriation in secondary schools In Anambra State. *Unizik Journal of Educational Research and Policy Studies*, *14*(1), 177-190.

Nwankwo, I.N. (2022). Management Practices for Controlling Fund Wastages and Misappropriation in Secondary Schools in Anambra State. *Unizik Journal of Educational Research and Policy Studies (UNIJERPS) 14 (1)*; 177-190.

Nworgu, B. G. (2015). *Educational research: Basic issues & methodology* (3rd ed.). Nsukka, Nigeria: University Trust Publishers.

Obumse, N. A. (2022). Influence of Parents Socio-Economic Factors on Psychosocial Adjustment Levels of Anglophone Adolescents Residents in Burkina-Faso, Francophone Speaking West Africa. Sapientia Global Journal of Arts, Humanities and Development Studies (SGOJAHDS), 5(3) p.g. 147 – 161

Obumse, N. A. (2022). Relationship Between Family Levels of Expenditures and Socio-Cognitive Adjustment Levels of Adolescents in Anambra State Nigeria. *Sapientia Foundation Journal of Education, Sciences and Gender Studies*, *4*(3). pg. 213 – 223

Obumse, N. A. P. (2022). Influence of Parenting Styles and Nurturance on the Psychosocial Development of Adolescents in Enugu State: Implication for Employability and Global Competitiveness in The New Normal. Sapientia Global Journal of Arts, Humanities and Development Studies (SGOJAHDS), 5(3); p.g. 59– 68

Obumse, N. A., & Chinwe, T. (2021). Sexual Violence Among Female Undergraduates in Anambra State: Prevalence, Patterns and Counselling

Practices. *Journal of Educational Research & Development*, *4*(1).

Ofozoba C. A. (2020), "*A Philosophical Reflection on Gender Inequality and the Status of Women in the 21st Century Nigeria Social Environment".* The International Journal of Humanities & Social Studies; 8(10) DOI No: 10.24940/theijhss/2020/v8/i10/HS2010-036. www.theijhss.com

Ogbaga, O. A. (2016). *Effects of brainstorming on the interest and achievement of secondary school biology students in Awka Education Zone*. Unpublished Maters thesis, Nnamdi Azikiwe University Awka.

Ojimba, C.C. (2020). Legal Implications of Technology Transfer to Nigeria. *Chukwuemeka Odumegwu Ojukwu University Journal of Commercial and Property Law*, *2*(1).

Okaforcha, C. C. (2021). Relationship Between Principals' staff Personnel Practices and Teachers' job Commitment in Secondary Schools in Anambra State. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *4*(1), 191-198.

Okaforcha, C. C., & Iloka, C. P. (2025). Disciplinary Measures as Correlates of Students' misbehaviour in Public Secondary Schools in Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *19*(1).

Okaforcha, C. C., & Okeke, I. N. (2020). School Leadership as A Correlate of Teachers' job Satisfaction in Public Secondary Schools in Awka Education Zone of Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *1*, 1-7.

Okaforcha, C. C., & Okeke, N. I. (2025). Towards Effective Safety Management in Secondary Schools in Nigeria. *Unizik Journal of Educational Research, Science and Vocational Studies*, *1*(1).

Okaforcha, C., & Okeke, N. I. (2019). Extent of principals' human resource management practices for teachers' job involvement in secondary schools in Anambra State. *African Research Review*, *13*(2), 145-155.

Okechukwu, E. (2025). Legal Protections of Teachers for Sustainable Workforce. *Unizik Journal of Educational Laws and Leadership Studies (UNILAWS), 1 (1).*

Okechukwu, E. (2025). Principals' Effective Communication Strategies for Improving Teachers' Job Performance in Secondary Schools in Anambra State. *Unizik Journal of Educational Research and Policy Studies VOL.19 (2).*

Okechukwu, E. (2025). Teachers Rights and Responsibilities and Societal Expectations. *Unizik Journal of Educational Laws and Leadership Studies (UNILAWS), 1 (1).*

Okeke, N. I. (2022). Principals' organizing Strategies for School Plant Maintenance in Secondary Schools in Awka Education Zone of Anambra State. *UNIZIK Journal of Educational Research and Policy Studies*, *13*(1), 167-173.

Okeke, N. I., & Okaforcha, C. C. (2025). Towards Effective Management of University Education in Nigeria. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Okeke, N. I., Okaforcha, C., & Ekwesianya, A. (2019). Attrition and strategies for teacher retention in secondary schools in Anambra State. *Global Journal of*

Education, Humanities and Management Sciences, 1(1), 148–156.

Okeke, N. I., Okaforcha, C., & Ekwesianya, A. (2019). Principals' School Self-Assessment Practices for Secondary School Improvement in Awka Education Zone of Anambra State. *Global Journal of Education, Humanities and Management Sciences* (GOJEHMS); 1(1), pg.128 - 136

Okoro, A.U. (2011). *Effect of interaction patterns on achievement and interest in Biology among Secondary School Students in Enugu State.* (Unpublished Master's thesis), Department of Science Education, University of Nigeria, Nsukka.

Okoye, A. C. (2021). Strategies for developing sustainable business education for economic development. *International Journal of Management Studies and Social Science Research*, *3*(2), 76-81.

Okoye, A. C. (2025). Digitalization Of Secondary School Personnel Management Practices for Managerial Effectiveness in Public Secondary Schools in Anambra State. *UNIZIK Journal of Educational Laws and Leadership Studies*, *1*(1).

Okoye, A. C., & Ezeaku, S. N. (2025). Digitalization in Teaching and Learning and The Challenges Hampering Its Smooth Flow. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *14*(1).

Onyekwelu, R. A. (2021). Principals' administrative Measures for Enhancing Instructional Effectiveness in Anambra State Public Secondary Schools. *COOU Journal of Educational Research*, *6*(1).

Onyekwelu, R. A. (2024). Enhancing the Quality of Secondary Education Through Professional Development of Teachers in Nigeria. *British Journal of Multidisciplinary and Advanced Studies*, *5*(1), 194-205.

Onyekwelu, R. A. (2024). Students' use of Search Engines as Correlate of Students Academic Performance in Senior Secondary Schools in Ogidi Education Zone. *Multi-Disciplinary Research and Development Journals Int'l*, *5*(1), 11-11.

Onyekwelu, R. A. (2024). Teachers' Professional Competencies as correlates of Student's Academic Achievement in Public Secondary Schools in Anambra State. AJSTME, Volume. 10 (3); 404-411; https://www.ajstme.com.ng

Onyekwelu, R. A., & Adinna, P. I. (2022). Influence Of Covid-19 On the Nigeria Secondary Education System: Effective Virtual Learning, The Way Forward (A Case Study of Anambra State). *Journal of Educational Research & Development*, *5*(2).

Osegbue, G. C. (2025). Crisis intervention and response in educational institutions: developing and implementing plans in developing countries. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *15*(1).

Osegbue, G. C. (2025). Early childhood education in Nigeria: challenges and prospects. *Unizik Journal of Educational Laws and Leadership Studies*, *2*(1).

Osegbue, G.C. (2019). Perceived impact of effective educational planning on education system for national cohesion and global competitiveness. *International Journal of Educational Practice (IISTE)*, 10(11), 108-117.

Osegbue, G.C. (2021). Principal' management of students' personnel services for attainment of educational goals in Anambra State. *Journal of Educational Research and Development, 4(1*), 85-92.

Osegbue, G.C. (2022). Effectiveness of visual video tutoring on students' learning in coping with COVID 19 in the new normal. *International Journal of Educational Practice (IISTE),* 13(21) 110-122.

Osegbue, G.C., & Nnubia, J.N. (2020). Adequacy of strategic plan implementation in secondary schools' administration for sustainable educational development in Anambra State, Nigeria. *Unizik Journal of Educational Management and Policy, 4(1)*, 104-114.

Osuafor, A. & Okonkwo, (2013). *Influence of family background on academic achievement of secondary school biology students in Anambra State*.

Rose L. R. (2014). *Effects of a cooperative learning strategy on post-secondary students' mathematics achievement.* Unpublished Thesis. Department of Curriculum and Instruction State University of Fredonia, New York.

Şahin, A. (2010). Effects of jigsaw II technique on academic achievement and attitudes to written expression course. *Educational Research and Reviews*, *5*(12), 777–787.

Schul, J.E. (2011). Revisiting an old friend: The practice and promise of cooperative learning for the twenty-first century. *The Social Study*, 102, 88-93.

Ucheagwu-Okoye, O. M. (2021). The Need for Arbitration as An Alternative Dispute Resolution Mechanism in Tax Disputes Resolution in Nigeria. *Idemili Bar Journal*, *2*.

Ucheagwu-Okoye, O. M. (2025). Educational Laws and Their Impact on Inclusive Education for Students with Disabilities in Anambra State: Implications for Sustainable Development. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Ucheagwu-Okoye, O. M. (2025). Role Of School Leaders in Promoting Mental Health Awareness Among Secondary School Students in Anambra State for Sustainable Development. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *14*(1).

Ucheagwu-Okoye, O. M. (2025). The Role of Artificial Intelligence (AI) in Student Assessment and Evaluation in Educational Leadership in Tertiary Institutions in Anambra State. *Unizik Journal of Educational Laws and Leadership Studies*, *1*(1).

Ugwaka, K. A. (2025). Availability, accessibility and utilization of e-learning resources in teaching agricultural science in senior secondary schools in Anambra state. *African Journal of Educational Management, Teaching and Entrepreneurship Studies*, *15*(1).

Ugwaka, K. A. (2025). Integrating digital agriculture into the undergraduate agricultural education programmes in Nigerian universities for vocational development. *Unizik Journal of Educational Research, Science and Vocational Studies* 2 (1); 229-241.

Ugwaka, K.A. and Igbokwe S.O. (2020). Effect of ration level on the growth and development of clarias gariepinus. *International Journal of Agricultural Research and Food Production,* 5(3); 1-9.

Ugwaka, K.A. and Igbokwe, S.O. (2023). Effect of Phthalates from Plastic Culture Materials on the Growth and Survival of African Catfish. *International Journal of Agricultural Research; 18 (1): 36-44.*

Wanbugu, P.W., Changeiywo, J.M., & Ndiritu, F.G. (2013). Investigations of experimental cooperative concept mapping instructional approach on secondary school girls' achievement in physics in Nyeri County, Kenya. *Journal of Education and Practice, 4*(6), 120-130.

Wayne, S. (2013). *Effects of cooperative learning on the academic achievement, social interaction, behavior, and effect of secondary English and social studies students.* Unpublished Master's Thesis. Faculty of the Education, Evergreen State College, United States.

Zakaria, E., Solfitri, T., Daud, Y. & Abidin, Z. Z. (2013). Effect of cooperative learning on secondary school students' mathematics achievement. *Creative Education, l4*(2), 98 - 100.

Zywno, M.S. & Waalen, J.K. (2002). The effect of individual learning styles on student outcomes in technology-enabled education. *Global Journal of Engng. Education, 6*(1), 35-44.