

Communication Process in Teaching and Learning in the Classroom

Akhigbe, J. O.

Department of Office Technology and Management, Auchi Polytechnic, Auchi, Nigeria
Email: joajoe1972@gmail.com

Abstract

Communication is central and indispensable in the classroom teaching and learning process. It is a very important component of the teaching and learning, without which it would be impossible to teach or learn. Classroom communication is positive, purposive and pragmatic in nature, it is a systematic and planned activity to share information and knowledge in educational institutions. In school system, some students may fail to cope academically because of ineffective communication in the classrooms. Learning in classrooms occurs through interpersonal communication between teachers among students. Teacher in the classroom requires communication skills to deliver content of learning that could lead to the attainment of educational aims and objectives. This paper discussed concept of teaching, learning and communication process in the classroom. The channels and styles of communication, nonverbal, visual communication, communication and classroom teaching skills. Communication barriers in class room and possible solutions. It was concluded that teachers should therefore try as much as possible to reduce communication barriers' by enabling student to link various information from different sources to the same content being taught will enhance good understanding and ensure attainment of the goals of teaching- learning in schools in Nigeria.

Keywords: Communication, Interpersonal, Skills, Classroom, Teaching/Learning

Introduction

Communication has been an important aspect of human daily living. Its place is so central formal organization in every society. Its importance is now heightened by the fact that the whole world is now a global village due to the development of modern technology. Incidences suggest that larger percentage of crisis in any organization as well as class room, result from breakdown in communication. Teaching is any activities capable of influencing and bringing about changes of behaviour of another person. Teaching process is a two way process and chain of activities where teachers instruct the learners in or outside the classroom and the learner is expected to responds. Teaching and learning as a three-way communication process involves active participation and interaction between the teacher, students, and content. The teacher facilitates understanding by presenting information effectively, while students engage through listening, questioning, and discussing Mark 2023.

There are several processes involved in teaching and learning process which range from teaching methods and approaches. Teachers know education is a two-way process so

learners cannot be treated as an empty vessels waiting to be filled with knowledge, rather they need to be challenged. Jonathan, (2023)

Interpersonal communication is effective communication between teachers and students. educators communicating with students need to pay attention to different ways of learning for each individual, serving students differently according to their needs, interests and interests and conveying ideas freely and directly so as to create a pleasant learning atmosphere, communicative and effective learning. ((Rohana, 2024)

This implies that every individual is a teacher and we all are involved in the business of teaching both formally and informally must involve more than two persons. Communication in teaching and learning process between the sender, who holds the role of the teacher or university professor, and the receiver, who represents the students to achieve this it is important to find a relationship between educational technologies and educational communication and knowledge of all the foundations, elements, and theories related to educational communication.

Since the purpose of teaching is to effects changes in human behaviour, then the direction of the changes depends on the objective and goals of the instructions. Effective communication in education helps create a conducive learning environment and improves student understanding and learning outcomes. Teachers who apply good communication strategies can achieve educational

goals more effectively (Mahdi 2023) communication in classroom is considered group communication because it involves many students, if students actively participate, communication can become two-way or dialogue, where both teacher and learners act as communicators. Students need to realize the importance of their role in this learning process and be active, responsive, ask questions, and participate in discussions. If students listen without contributing, communication will be one-way and less effective.

Learning is the change in behaviour resulting from experience, listening and following instruction which must be permanent. ([Kendra Cherry](#) 2025) Teaching and learning is a multi-dimensional process of activities which complex interactions between the various elements of education. Teaching has made a man to known what was unknown in or der to face the reality of his environment, hence a teachers has to employ various devices in the process of teaching another.

Communication, it is also a communication that occurs between two or more parties to exchange information and send and receive different data to achieve a specific and clear goal. (Rise vision 2023) Where the source of the information is the teacher, the student receives that information. In order for this communication to take place correctly, a response must occur between the two parties. And this is a prerequisite for it to be correct for us to say that communication has taken place in teaching and learning process, there must be

1. Thinking
2. Problem solving
3. Physical expression
4. Understanding and application
5. Demonstration

All these express responses that demonstrate that the student has received specific information and has shown an appropriate response.

Communication in the classroom

Classroom communication is the interaction between teachers and learners and between learners and learners. Communication is key in the classroom: successful teaching is generally considered to require only 50% knowledge to 50% communication skills. As a result, a teacher should be proficient in all four modes of communication – listening, speaking, reading, and writing – and should know how to utilize this proficiency effectively in a school environment. (Sward, 2020). Classroom discourse refers to the language that teachers and students use to communicate with each other in the classroom. Talking, or conversation, is the medium through which most teaching takes place, so the study of classroom discourse is the study of the process of face-to-face classroom teaching. It is generally claimed to form an isolated discourse domain. Teachers and students construct an understanding of their roles and relationships, and the expectations for their involvement in the classroom. To be successful, students must develop the communicative competence.

Communication in the classroom involves the teacher and the learner who share common meanings and experiences of the environment. To be able to communicate effectively the content of the subject matter must be encoded in verbal or symbolic form. This can be transmitted through media and the receiver who is the learner must receive the message and decode and interpret it for understanding. Communication within the classroom is important in order for students to learn effectively and should be put in place from an early stage of learning. Classroom communication is different from group communication because it serves a unique purpose that combines: content delivery, procedures, or behaviour control (Open textbook cc. 2016).

Content Delivery focuses on *what* is to be learned, it describes the material to be delivered and for example, when a teacher explains or elaborates on a concept of new knowledge, it refers to the content (Zoe, S. Gill, C. 2022) Usually content relates to the curriculum and current learning objectives.

Procedure refers to the administrative routines needed to accomplish tasks in teaching and learning in a classroom. It provides information about how students coordinate their

activities in the classroom. Procedures in classroom is to correct unwanted behaviour in the classroom and the school environment in general. (Allison teacher's course.docx 2024). Administrative procedures provide the guidance that students need to coordinate with the teachers as well as the students.

Correcting Misbehaviors. Most times correcting misbehaviours originates from the teacher, but students sometimes engage in it with each other as well as the teacher. One student may look at a nearby classmate and whisper, the teacher may attempt to silence the behavior. Or a student may respond to being teased by a classmate by saying simply, "Stop it!" Whether originating from the teacher or a student, correction of misbehaviours may not totally be effective in the classroom. The purpose is to influence or control inappropriate behaviour, hence it is obviously important for managing class effectively. The goal of the classroom is to keep the focus on learning, while maintaining discipline physically and emotionally for all. To achieve this, teachers should respond to misbehavior by

- Stopping the misbehavior and reestablish positive behaviour as quickly as possible
- Maintain learners' dignity
- Develop learners' self-control and self-regulation skills
- Demonstrate that rules the classroom safe

In classrooms where teachers use this approach, learners respond quickly and respectfully when there is misbehavior. Teachers must address minor problems before such behavior gets out of control. Children are held accountable for their behavior, with teachers guiding their learning so they can make better choices next time. (Responsive classroom 2024)

Many class activities are patterned in such a way that guide class members to learn without being reminded. A Teacher, for example, has a particular participation structure of teaching, or exposing students to the content or materials while, students are responsible for listening and asking questions or comments when called on. The teacher, on the other hand, has the responsibility to teach at length depending on the duration of the lesson. The following is are class activities according to Andrew Jocus (2012).

1. Lecturing
2. Questions and answers
3. Discussion
4. Group work

Each of these influences how communication process in the class room among teachers and students. Classroom communication exists in three categories: verbal, nonverbal, and written.

Verbal communication refers to as oral communication implies communication through vocal sound in oral in form and are accompanied by auditory signals produced by a vibrating organ, such as the larynx in mammals' throats (Akhigbe, 2024). The vocal communication is the process through which teachers express the nonverbal components of their speech to verbal form during classroom lesson, through speeches, presentations, demonstration and discussions. Technically, written words are considered verbal forms of communication because written information can be read out. to learners using vocal sound.

Non-verbal communication entails conveying information, ideas or messages through visual elements, such as body language, images, charts, diagrams, videos, and may others (Akhigbe, 2024). Non-verbal communication has a role to play in education, such as teaching and demonstration using diagram, videos chats and may others. This is very relevant in engineering, advertising and so on. Having a good baseline of visual communication skills is very important, as it can be one of the most effective forms of communication for keeping people engaged and helping them retain new information in graphic and in pictorial form. For example, if a teacher is nodding their head while a student is speaking, this can be encouraging or show that they agree with the student. Non-verbal communication refers to any communication between two or more people that involves the use of facial expressions, hand motions, body language, postures, and gestures. These non-vocal cues can provide insights, supplementary information and significance in addition to spoken communication in teaching and learning process

Written communication in the classroom refers to the exchange of information or subject content through written text. It's an essential component of **Communication** encompassing everything from assignments and emails to interactive digital platforms. This form of communication disseminates knowledge and plays a critical role in evaluating student understanding and progress. Effective written communication skills are crucial for success in various class room settings, each highlighting a specific aspect of written communication from *academic report writing* to *interactive whiteboard usage*. The following are areas where written communication is used in the class room: Lab Reports, The use of Whiteboards, Group Projects, Research Assignments and Creative Writing/ Essays. Written communication is the sending or receiving information in written forms. For example, a teacher may arrange a written assignment for students to test their knowledge or present lecture slides or notes for complicated information.

Teachers may propose several different classification schemes of communication, which are organized in a hierarchical order or in a multidimensional space following a set of levels of representation that are potentially related

1. Teacher - Student

2. Students - Students
3. Small peer group
4. Teacher — All Classroom Students
5. All students of the classroom

Visual communication is the use of graphics images, videos to represent information. Visual communication is mainly used to add better meaning and understanding to the information communicated. Individuals use visual communications to help them depict emotions in the audience, thus making the communication more relatable. Videos form of visual communication is popular and assists in relaying information about a new idea concerning a company new product, a video can tell the company's stakeholders about it (Study.com 2025) Visual communication has a role to play in teaching and learning process. Having a good baseline of visual communication skills is important, as it is one of the most effective forms of communication for keeping learners engage on new content with the help of graphics, info graphic, chart, maps, pictures, gifs and animations.

Teacher/Class Communication. Teacher/class communication exists when a teacher communicates with his entire class. Verbal communication exists when a teacher tells students information they need to know. For example, if a teacher asks a student to "stop talking," this is a direct form of verbal communication. There are ways for teachers to communicate nonverbally with their classes, such as through their posture, gesticulations and proximity to the students. Instead of telling a student to stop talking, a teacher could use nonverbal communication by moving toward the disruptive student's desk. Not only does the disruptive student receive the message, but other students in the class who observe the intervention receive it as well. Written instructions for an assignment are given from the teacher for the whole class

Teacher/Student Communication. Teacher/student communication occurs when a teacher interacts directly with a particular student. Since a teacher interacts with her students mostly in front of the whole class, it can be difficult to distinguish teacher/student communication from teacher/class communication. Teacher/student communication requires that the teacher act one-on-one with a student, such as in a conference during class activities, before or after class or after school. This type of communication is effective for teachers who want to communicate a private message, such as a talk about constant inappropriate behavior or about taking more of a leadership role in class.

Student/Teacher Communication. Student/teacher communication is also direct communication between a student and the teacher, but this time it is the student who initiates the conversation. Also, this can occur during whole-class participation. For example, a student who asks a teacher a question during class discussion engages in

student/teacher communication because it is a single student communicating with a single teacher. The reason the reverse situation constitutes teacher/class communication and not teacher/student is that the teacher's actions and messages are directed toward the whole class while the student's questions here are only directed at the teacher. When students write emails to their teacher on graded assignments, this constitutes a written form of student/teacher communication

Student/Student Communication. Student/student communication occurs when two or more students interact with one another. Successful whole-class discussion stimulates student/student communication because students should talk to each other and not just to the teacher. Two students may disagree and talk back and forth to each other during such discussions. Student/student communication also occurs when students work in groups or pairs to complete assignments.

Student/Class Communication. Student/class communication exists when a student or group of students direct their information to the entire class. Whole-class discussion can also stimulate this type of communication. For example, if a student asks the class a question during a discussion, the student's message is directed at the entire class. Individual or group presentations also constitute student/class communication, and it is this type of communication about which students feel most nervous or self-conscious.

Types of Classroom Interaction

1. Collaborative learning Interaction
2. Discussion And Debate Interaction
3. Interactive Session Interaction
4. Conversation With Learners Interaction
5. Loud Reading Interaction
6. Story Telling Interaction
7. Role-play Interaction

Nature of Classroom Communication

1. Power belongs to both teachers and students.
2. Teacher and student bring their own agenda to the classroom.
3. Human interaction creates a context in which further interaction occurs.
4. Some of the resources teachers and students use as they built a of structure relationship.

Significance of Communication in the Classroom

According to Everstudy Classes (2025), the significance of communication in the classroom is that:

1. It brings clarity and distinctiveness in the speech.
2. During interaction teachers have the scope to identify the talent, intelligence and excellence of the learners.
3. Learners can be prompted to think and do something new in subject area.
4. It provides learners the scope of speaking and probing into his/her subjects.
5. Learners-can-acquaint-themselves with the—new—topics—of interactions.

Classroom Communication

Classroom communication is the type of discourse in form of narration (stories), exposition, persuasion, demonstration, instruction etc. According Shah (2021) posited that a typical process of communication in the classroom includes the following five distinct stages:

1. Formulation of message
2. Message encoding
3. Message transmission
4. Message decoding and interpretation
5. Feedback and evaluation

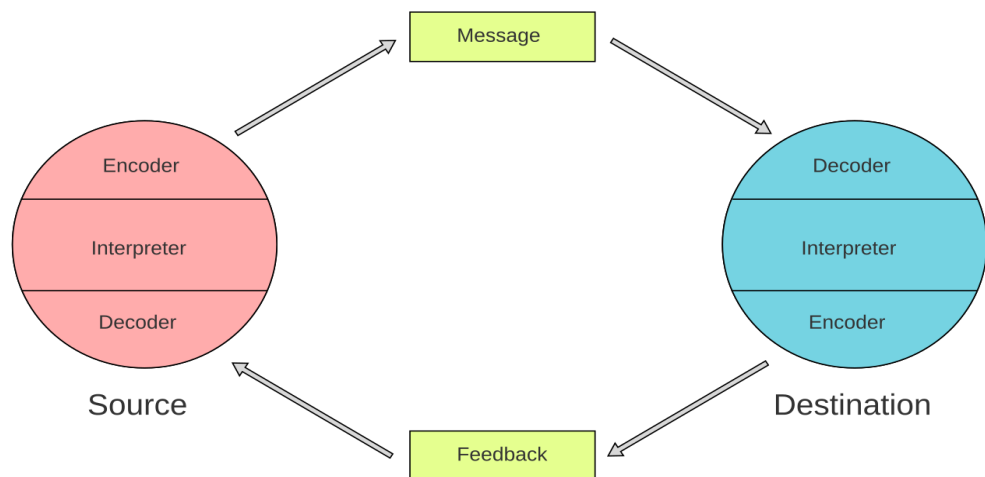


Figure 1: Schramm's model https://en.wikipedia.org/wiki/Schramm%27s_model_of_communication

Schramm's model of communication was proposed by Wilbur Schramm in 1954 it is one of the earliest interactive models of communication. It holds the view that communication occurs in a circular way, which implies that both the sender and the receiver exchange roles and participate equally in communication in the same environment and are subject to the same experience. This differentiates it from other models, which view communication as linear. Communication in teaching and learning involves elements such as the sender, the message, the medium or channel and the receiver in the classroom environment, where both the receiver and sender are subject to the same experiences. The sender in the teaching and learning situation encode, decode and interprets responses from the learners while in the same way, the receiver decode message from the sender, interprets and encode responses as feedback to the sender.

Classroom communication is mainly on the message and feedback, as the main focus of the teaching and learning situation. The purpose of classroom communication it to educate others: through communication, the teacher is able to pass information or instruction to the learner, which help to educate inform and transform the learned. As indicated by Kumar (2021) and Everstudy Classes (2025), communication during teaching and learning focus on the following:

1. Content of the subject matter
2. The goal of the communication should be clearly and specifically stated
3. Receiving reactions and a response from the receiver or learners
4. Instilling the motives of the content for all parties to understand.
5. The knowledge of the teacher about the content and subject matter
6. Language used by the teacher during interaction
7. Teachers teaching methodology and style
8. Teaching learning material and teaching aids
9. Physical and social environment of the class room
10. Teachers' communication skills (gestures/ body language etc)
11. Teacher and students' relationship.
12. The use of technologies

When teachers observe the factors above it means teaching and learning will be successful and the success will depend directly on communication skills, without having a good communication the teacher cannot interact positively with students.

Another relevant model to classroom communication is the interactive model. The interaction model of communication includes physical and psychological contexts. The physical context refers to the environmental factors like temperature, layout, size and lighting of a place and how it has an impact on the communication.

The psychological context refers to the emotional and mental factors like anxiety and stress in the interactive communication process. For instance, a student is set to appear in his final examinations and he comes to know that his father is ill, this will have an impact on his emotional and mental state that can lead to anxiety and stress. Thus, he will not be able to utilize his full potential and write his examination paper properly. In both examples, the physical and psychological contexts have created an impact on communication. Examples of the interactive models of communication include:

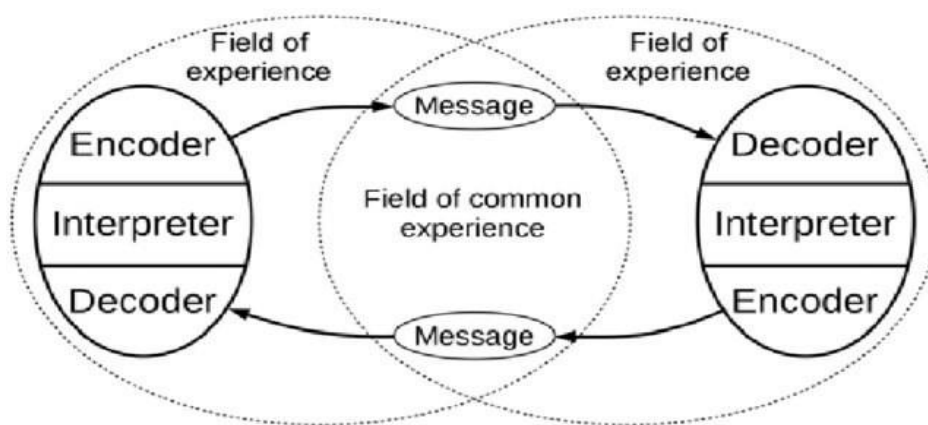


Figure 2: The Interactive Model: Adoted from Adoted from https://www.researchgate.net/publication/311739283_A_Multimodal_Nonverbal_Human-Robot_Communication_System/figures?lo=1)

The interactive model is also regarded as Osgood –Schramm model because it was developed by the two of them (Wilbur Schramm and Charles Osgood) in 1950. It is a combination of the linear model and the cyclic model which emphasize that communication is continuous and dynamic and interactive rather than pone way process. Important components of the Interactive model for communication are as follows-

Encoder-Source-Decoder: In this component of interactive communication, the source is the person who originally sends the message and the encoder and decoder is the same source or person. The second source is also referred to as encoder and decoder. The source while sending a message will act as an encoder and while receiving it will act as a decoder. The second source in communication will decode the message and again originate another message. It will then encode it and transmit it to the first source. It is the source who is referred to as encoder and decoder when encoding and decoding take place.

Message: The information that is sent and received in the interactive communication process is referred to as message

Feedback: After the decoder receives the first message he/ she will responds to the message which form a second message and known as feedback.

Field of Experience. The field of experience in the interactive communication process refers to the knowledge and experience that the sources already has. It has a direct impact on the way the message is formed and how it is interpreted. An example will be how the behaviour, values, psychology and culture will affect a person's interpretation of the actual message.

Barriers to Communication in Teaching and Learning Process

1. Using the same old traditional methods without taking into account individual differences among the learners.
2. The inability to control the student's attention and focus, and mind wandering most of the time of educational communication
3. The presence of the student and the teacher in a study environment that is not equipped with the necessary tools to facilitate communication process.
4. Semantics: Semantics refer to messages that are unclear, ambiguous, or lacking necessary context that can lead to misunderstandings and misinterpretations such as the concept of subject-verb agreement and gender pronouns.
5. Information Overload: Excessive information can overwhelm learners and make it challenging to prioritize essential information in regard to a content. It can led to decreased attention to retain information due to too many assignments, engagements and notifications.
6. Denotation and Connotation: Confusion may arise from the use of language by a teacher from different educational levels, culture, and dialect. Some words may have a certain connotation for a group of persons that is not shared, for instance "That's sick!" could be a compliment or an insult, depending on the listener.
7. Emotional Disconnects: Emotional factors such as stress, hunger, anxiety, frustration, or conflict can hinder listening skills, and it can result in cloud judgment.
8. Credibility of the teacher: In academics, the validity of learning depends on the reputation of the teacher/the instructor. If learners do not trust the capability of the teacher, they will view the teaching and learning process with skepticism and suspicion.

How to communicate effectively in Teaching and learning process

There are different skills and approaches that make Communication in Teaching and Learning Process more valuable, they are:

1. Teachers should focus on the tools used to communicate in the classroom, innovate in them, and also use modern technologies.
2. Teachers must be able to make clear the content and goal of the curriculum and focus on it, when delivery lecture.
3. Taking into consideration individual differences among learners or students in terms of behavior, culture and social life is very crucial for classroom communication.
4. Finding distinctive tools and methods to attract learners' attention and arouse their interest is also very important.
5. Choosing a suitable place that is free from noise that may enhance students' concentration.
6. Teaching the student how to search and obtain information is important because information is constantly evolving.
7. Enabling the student to link various pieces of information from different sources to the same topic is essential.
8. Courses and textbooks are not the only source of knowledge, there are many ways, including e-mail, social media, discussions and debates, online research, and browsing trusted blogs.
9. The learner's skills and ability to link different fields and ideas are what develops education and enriches educational communication.

References

- Abdullahi, M. (2019). Effects of visual instructional materials on students' performance in Agricultural Science of senior secondary schools in Taraba State, Nigeria. *Ahmadu Bello University Repository*. Retrieved from <https://kubanni.abu.edu.ng/items/4081dcee-de7b-4dd0-97b1-71e9bd8b590b>
- Abubakar, A., Musa, A., & Waziri, H. (2021). The impact of audiovisual materials on student learning and retention. *Journal of Educational Technology and Innovation*, 12(3), 45–57.
- Abubakar, H., Arilesere, J., Jemilat, O., & Oluranti, H. (2021). The role of technology in enhancing teaching and learning. *Journal of Educational Research*, 12(3), 45-58.

- Anrijs, J. (2020). Reliability testing in educational research: An overview of Cronbach's Alpha. *Springer*.
- Badmus, I. O., Adekunle, T. A., & Yusuf, B. O. (2019). Challenges of science education in Nigeria: A case study of secondary school students. *African Journal of Science Education, 10(1)*, 112–126.
- Badmus, T., Akanmu, M., & Akanbi, S. (2019). Challenges in science education in Nigerian schools. *African Journal of Science and Technology, 8(2)*, 112-129.
- Barai, B. (2018). Effectiveness of audio-visual aids in the teaching-learning process: A study at Darsh College of Education, Gohana, Haryana, India. *International Journal of Educational Research, 15(2)*, 78–92.
- Ehiem, E. (2023). Effect of audio-visual instructional materials on senior secondary students' achievement in Agricultural Science in Abia State. *Michael Okpara University of Agriculture Repository*. Retrieved from <https://repository.mouau.edu.ng/work/view/effect-of-audio-visual-instructional-materials-on-senior-secondary-students%60-achievement-in-agricultural-science-in-abia-state-7-2>
- Eze, S. M., Eze, I. R., & Ugwu, A. N. (2021). Effects of multimedia application on students' academic achievement in Agricultural Science. *ResearchGate*. Retrieved from https://www.researchgate.net/publication/376596448_effects_of_multimedia_application_on_students%27_academic_achievement_in_agricultural_science
- Ikehi, M. E., Onu, F. M., & Oats, A. (2021). Agricultural science education and its role in food security. *Journal of Agricultural Education and Extension, 27(4)*, 265–280.
- Ikehi, M. E., Paradang, B. S., & Zimoghen, J. (2021). Agricultural science education and resource utilization. *International Journal of Agricultural Research, 15(1)*, 89-104.
- John, B., Musa, H., & Waziri, S. (2018). Comparing conventional and audiovisual instructional methods in secondary school agricultural science. *Journal of Science and Technology Education, 14(2)*, 78–89.
- Karadeniz, S., & Akpınar, B. (2015). Effects of audiovisual instructional materials on student achievement: A meta-analysis. *European Journal of Educational Studies, 7(2)*, 101–120.
- Kumar, R., Jaafar, A., & Yahaya, N. (2016). Gender and multimedia learning: An assessment of learning outcomes and motivation. *International Journal of Educational Multimedia, 9(3)*, 55–67.

- Lari, F. S. (2019). Effective teaching strategies and their impact on student learning outcomes. *Journal of Modern Educational Research*, 6(2), 39–52.
- McNaught, C. (2007). The use of multimedia in education: A review of best practices. *Educational Technology Review*, 14(3), 98–112.
- National Literacy Trust (2025). *Ministers urged to add audiobooks to England's new schools curriculum*. The Guardian. Retrieved from <https://www.theguardian.com/education/2025/feb/25/audiobooks-england-new-schools-curriculum-reading-national-literacy-trust-poll>
- Ngozi, C. N., Obinna, R. T., & Okechukwu, F. (2021). The effect of instructional materials on student performance. *West African Journal of Education*, 20(1), 59-74.
- Ngozi, P. U., Adeyemi, T. B., & Chukwu, J. O. (2021). Instructional materials and student performance: An analysis of learning outcomes in Nigerian secondary schools. *Journal of Curriculum Development*, 18(1), 123–138.
- Ode, E. (2014). The role of instructional materials in effective teaching and learning. *Nigerian Journal of Educational Research and Development*, 11(2), 65–78.
- Ojelade, S. A., Adewale, K. T., & Oyewole, P. (2020). The impact of audiovisual instructional materials on student engagement and comprehension. *Journal of Educational Innovations*, 9(1), 88–101.
- Ojelade, O., Aregbesola, M., Adams, F., & Aiyedun, S. (2020). The virtual generation and educational transformation. *Contemporary Learning Journal*, 18(3), 87-102.
- Onu, F. M., & Ikehi, M. E. (2021). Enhancing agricultural science education through the use of instructional materials. *International Journal of Vocational and Technical Education*, 13(3), 176–190.
- Onu, F. M., & Oats, A. (2020). The importance of agricultural science in secondary education. *Journal of Agricultural Studies*, 25(4), 211–225.
- Onu, P., & Ikehi, M. (2021). The role of instructional materials in vocational education. *Journal of Vocational Studies*, 14(2), 67-81.
- Onu, P., & Oats, R. (2020). Agricultural science education and sustainable farming. *Journal of Agricultural Education and Development*, 11(4), 54-73.
- Olayinka, A. (2021). Effects of technology-enhanced instruction on Agricultural Science students' learning outcomes in senior secondary schools in Ekiti State, Nigeria. *International Journal of Research and Scientific Innovation*, 8(1), 45-50. Retrieved from <https://rsisinternational.org/journal/ijrsi/articles/effects-of->

[technology-enhanced-instruction-on-agricultural-science-students-learning-outcome-in-senior-secondary-schools-in-ekiti-state-nigeria/](#)

- Samreen, A., Khan, M. A., & Rehman, S. (2012). The effectiveness of audiovisual aids in enhancing student learning: A case study of secondary schools. *Pakistan Journal of Educational Research*, 5(2), 35–49.
- Singh, R., Sharma, K., & Upadhy, D. (2019). Enhancing learning capacities through technology. *International Journal of Education and Learning*, 27(2), 101-119.
- Talathi, P. S., & Mandavkar, R. (2019). Agricultural production and technological advancements. *Asian Journal of Agriculture*, 16(1), 23-39.
- Talathi, P., & Mandavkar, M. (2019). Agricultural science education: Bridging the gap between theory and practice. *Journal of Rural Education*, 6(3), 112–130.