
Utilization of Resources for Effective Teaching and Learning of Science

By

Abu, Alice Oladehinde

Faculty of Education

Department of Science Education

Kogi State University, Anyigba, Kogi State

Email: dehincaleice@gmail.com

ABSTRACT

This paper examined the resource materials for teaching and learning of science. The paper also looks at various types of resources available to teachers in schools to pact knowledge. Different definitions of resource material were mentioned for example resource materials are potent tools which can be used to effectively communicate science, while enhancing the learning experiences of learners and achieving the lesson objective. Some of these resources include material, human and physical resources among others. Example of resource materials include motion pictures, television, model, while human resources include resource person or resource individual and physical resources include an abandoned farm, a wood of forest field and Printed materials like Learning Activity Package (LAP) etc. The advantages of these resources include making learning more enjoyable, meaningful and permanent. In the absence of these resources, teachers are advised to improvise. It was recommended among others that teaching and learning of science cannot successfully be implemented without adequate science resources or facilities. There is need for the government, parents, and voluntary organizations to join hands in procuring necessary facilities or resources in schools.

INTRODUCTION

Teaching and Learning of science can only be meaningful and effective if backed by the necessary resource materials. The materials are teaching facilities or resources, which would make the learning of science effective (Sandetur 1976). Victoria (2006) viewed the use of resource materials to facilitate teaching of science should be a welcome development. The dimensions and characteristics of science are designed among other things to develop in an individual an inquiring mind and scientific approach to problems, hence since science teachers should shift from memorization or rote learning to process learning through effective teaching (Joshi, 2008). There is a need to integrate teaching with activities that will promote academic achievement of learners. Use of resource materials in teaching is one of such ways (Abdudulahi, 2009). Resource materials as teaching are very useful and dependable in capturing students' imagination if used correctly. If effective selection is made, it will motivate students to learn and remember what is learnt, whenever there is need for recall (Atadoga 2008).

WHAT ARE RESOURCES?

Resources otherwise called instructional materials are educational input such as object of study which facilitates teaching and learning process and bring about success in the classroom (Usman, 2007). Learning becomes real and immediate because resource material aids utilization, emphasizes understanding and practical activities. Resource material

stimulates a learner to develop interest thereby achieving the desired goal. According to Ojo (1995) defined resources for communicating science as human and non- human resources that promote or enhance interactive learning of science. Agwu (1994) opined that resources in an educational sense are those things in the school or its environment that may be used to help teaching or learning.

Types of resources and their uses in teaching science effectively

There are different types of resources that can be utilized to teach science effectively. This includes Material, Human and Physical Resources etc. Resources in education have been in use for a long time now going as far back to days of Plato, one and his students believed in the effective of resources in enhancing learning. Even the ancient Chinese believed that what is easily forgotten, what is seen is easily remembered what is done is fully understood Sambo (2008).

Material Resources

Examples are

1. ICT Equipment: ICT equipment include computers, the internet, CD-ROMS and other software, radio, video and digital cameras etc. The development of information communication technology (ICT) is an ovation that plays a great role in teaching of science and technology. The development of videotapes, overhead projector and computers has made the learners more interested and involved in the learning of science. The ICT real-time experiment, saves time of capturing in laboratory and allows spending more time for interactions for the analysis of others variables and for the rapid repetition of experiment.
2. Massive Open Online Courses (MOOCs): Examples are connectives Moocs (Moocs) and instructivist (Moocs), etc emphasis is placed on learning ecology, and it is an online tools and resources, in the process of learning and networking. Moocs are learner – centered ecologies at learning in which learners participate in the flow and generation of knowledge by creating networked technologies such as blogs, wikis, Twitters, and Facebook. Additionally, the participation of Moocs, requires learners to assume active roles in a spirit of openness in forming their learning experiences and networking activities to develop digital competence to manage the abundance of resources. Moocs promote the ideals of restructuring the spacing of learning from classroom to open network ecology that enable learners to have greater control over their learning experience, content, and us of technologies Mohsen (2017).
3. Motion picture: this provides several techniques in motion picture photography, which will quicken the understanding of science abstractions. Slow or speed up time, focus attention, enlarge or reduce object for better perception.
4. Television: it can be used to present to students with a learning programmes, it assist the learner by helping him to understand what he is learning by seeing it presented in a simple and clear manner. Practice skills, which use the skills he is learning and solve problems by using his newly acquired knowledge and test his learning e.t.c.
5. Models: these are substitute to unavailable objects, either because they are so small, they cannot be seen with naked eye (e.g. bacteria/virus) too large to be brought into

- the class (aero planes) or two abstract (like the atom). The teacher then tries to create imaginative picture of these objectives.
6. Apparatus for Experiments: according to Maduabum (1992) student need a rich store of concrete sensory experience to aid understanding of their learning. He went further to stress that modern technology has placed within the reach of the teacher, a vast array of teaching aids, providing an escape from verbalism and aiding concrete learning. It is a known fact that whenever appropriate apparatus is used for practical and demonstrations, students learning are enhanced. Bajah (1983) quotes an experienced integrated science teachers are saying, 'give me enough test-tubes and beakers and I will teach most of the topics in integrated science'.
 7. Textbooks: textbooks serve as good service of information for both. Students can be directed to seek out additional source of information. Some science books cover wide variety of scientific activities; which have been designed to encourage and promote the learners natural curiosity. The activities allow them to predict experiment and evaluate. Many of the activities leave the learner with a question and ideas to further investigate. Most science textbooks include a list of suggested activities, recommended readings and review questions, which the learner can use or modify to suit his needs.
 8. It provides a common experience for the whole class. Students are often required to use the same textbook for a particular subject. Hence, they share the same experience from reading at which is essential in promoting a more intelligent class or small group discussion and other similar activities involving cooperative endeavor. They are readily available, students can always refer back to the textbook to review or verify points. Commenting about permanency of the textbook Rowntree (1974) said 'at least go back to the beginning and start again, see the whole shape of the argument in black and white and above all, re-read it whenever you like'.
 9. Printed materials e.g. Learning Activity Package: the whole process of learning activity package (LAP) is student centered. The teacher is only brought in when there is need for it. LAP encourages students to work out the learning activities and proceed themselves.

Abu (2003) identified some of the advantages of LAP in teaching science to include science to include;

1. Helping students to carry out scientific process such as ability to experiment, observe, classify, predict and infer.
2. It builds self confidence in students.
3. It enables to tackle and solve problems through their learning experience.
4. It builds scientific attitudes in students such as open mindedness, curiosity, determinations, skepticism.
5. It is a complete type of learning because it involves the use of all the senses of learners and
6. It results in meaningful learning because it satisfies bloom's taxonomy of educational objectives i.e. cognitive, affective and psychomotor domains.

HUMAN RESOURCES

Human resources in science is a person or group of persons with a field of specialization in its profession or occupation and capable of teaching adequately a concept content area in science. The importance of human resources in learning science cannot be overemphasized. Without human resources, teaching and learning will not take place effectively especially in science where the teachers must always be around to guide and direct students in the learning process. Okebukola (2002) asserts that science teachers should work beyond stereotyped science teaching-learning process and utilize the available human resources to facilitate science teaching learning process. Conscientious teachers are aware of the instructional advantages to be gained by using carefully selected resource person.

1. They provide students with a vivid and realistic contact with life outside the school that could not otherwise be achieved.
2. A resource person who is immersed in an important enterprise related to the course content is a real and exciting experience for students.
3. Resource individuals often expose students to the activities and functions of the community in a meaningful and helpful way.

Timothy (1998) identified eight advantages of using human resource personnel in teaching science:

1. Owing to their specialization in the field they are most competent to treat related topics.
2. They can serve as a compliment to the teacher since teachers themselves cannot claim expertise in the entire field.
3. Human resource will enable pupils to appreciate and prepare for other area in science curriculum.
4. It enhances interaction between education science and society.
5. It makes learning more interesting, enjoyable, meaningful and permanent. It appeals to all the sense organs of the learner.
6. It is less expensive especially when the resource person is within the environment.
7. It can supplement laboratory lesson and some as teaching aids to the teacher.

PHYSICAL RESOURCES

These are;

1. An abandoned farm field which offers and excellent to observe the process of ecological succession.
2. A wood or forest near the school may be instructive for discovering seasonal changes in animals, their interdependence on each other, finding examples of useful and harmful animals.
3. A vegetable or flower garden may be instructive for studying how plants obtain light, moisture, their preparation for plating or transplanting e.t.c. A creek or pond may be useful for observing lands of flower and fruits in a moist environment, also animal are adaptations to life in or near waters e.t.c. (Wuyep 1997).

In summary, resource materials can be used to supplement or compliment the teacher's tasks. Teachers should no longer rely solely on words to make their meanings clear

there is the need to use resource materials. These can be used to make out meanings more vivid and interesting. Balogun (1982) identifies three educational reasons why there is the need for science. According to him resources in science teaching enable the learner to:

1. Develop problem-solving and scientific attitude
2. Acquire scientific appreciation and interest
3. Develop functional knowledge and manipulative skills

CONCLUSION

The use of resources is essential in helping students to explore and develop ideas about their environment and be scientifically literate, in the absence of these resources or inadequate facilities and equipment, teachers should not use it as an excuse for poor teaching or skipping that topic or theme. Teachers should learn to improvise. Adebimpe (1997) observed that one problem in Nigeria is that very few teachers practice improvisation while majority depends on imported equipment. Eshiet (1996) and Balogun (1982) opined that in the face of scarce financial resources, schools and teachers are constantly being have to provide 'look-likes' which can take the place of conventional equipment thus serving the same purpose. This will help a long way helping our students to want to learn science.

RECOMMENDATION

- Since science is activity oriented, learners should be involved in improvisation such as drawing of charts, molding models, construction of materials e.g. wheel balances, sloop nets, etc. this will enable the learner to enhance knowledge.
- Teaching and learning of science cannot successfully be implemented without adequate science facilities/resources; there is need for the government, parents, teachers, association, philanthropist and voluntary organizations to join hands in procuring necessary facilities or resources in schools.
- Science teachers need to be trained through in-service training workshops to learn skills of resources utilization thereby move up higher in the level of use scales to creativity level. (Benedicta 2000).

REFERENCES

- Abdullahi, M. (2009). *Basic Concepts in Education* Kano Mats Commercial Press
- Atadoga, M. M. & Mary, A. O. (2008); *A Hand Book on Science Teaching Method* (1), 124
- Agwu, S. N. (1994): Strategies for Resources Development for Education *Cobarau Journal of Education*, (1) 101.
- Abu, A. O. (2003): Effect of Learning Activity Package (LAP) as Resource Material for Learning Secondary School Biology *Nigerian Journal of Functional Education*, 2(1), 108 – 113
- Adebimpe, A. O. (1997): Improvisation of Science Teacher Resources, *40th Anniversary Conference proceeding of STAN*, pp. 55-59.
- Balogun, T. A. (1982): Improvisation of School Science Equipment, *Journal of the Science Teacher Association of Nigeria*, 20(2), 131-137.
- Bajah, S. T. (1983): *Teaching Integrated Science Creatively*. Ibadan University Press.
- Benedicta, C. A. (2000): The Level of use of Resource Utilization in the Integrated Science Master Plan by the Teacher. *Science Teachers Association of Nigeria, 4th Annual Conference Proceedings UNESCO Assisted Publication* 55-59.

- Eshiet, I.T. (1996): Using Demonstration Method in the Teaching of the Concept of Diffusion of Gases: Improvisation and Cost Reduction, *Journal of the Science Teacher Association of Nigeria*, 21(5) 15-18.
- Joshi, S. R. (2008). *Teaching of Science*. New Delhi A.P.H. Publisher Corporation
- Muduabum, M. A. (1992): *Teaching Biology Effectively*, Owerri, Imo State. Whyte and White Publishers.
- Mohsen, S. (2017): A new ecology for learning. An Online Ethnographic Study of Learners Participation and Experience in Connectives Moocs. Unpublished Doctoral Dissertation on Educational Technology Faculty of Educational Science University of Helsinki Helsinki students in Education, 4.
- Ojo, D. A. (1995): *Resources for Science teachers, An Introduction to Science Education*, Abeokuta Zenith Press.
- Okebukola, P. A. O. (2002): Beyond the Stereotype to New trajectories in Science Teaching Special Lecture Presented at the 43rd STAN Annual Conference of STAN and CASTME. Abuja Nigeria.
- Rowntree, D. (1974): *Educational Technology in Curriculum Development*, Hamper and Row, London.
- Sandetur, G. D. (1976): *Teaching Science in the Elementary School*. Hamper and Row Publishers.
- Sambo, A. A. (2008). *Research Method in Education*. Stirling-Horeden Publishers (Nig) Limited, Ibadan Oyo State Nigeria
- Timothy, J. (1998): *Using Human Resources to enhance the Learning of some Basic Concepts/Contents Areas in Integrated Science*. 39th STAN Annual Conference Proceeding. 192-196
- Usman, M. (2007). Teacher's Qualification and Quality of Instructional Material as Factors Influencing Withdrawal for Vocational Institution in Jos Metropolitan Educational Forum. *Journal of Educational Studies* 10; 80 -85
- Victoria, N.I. (2006): *Enhancing the teaching of Biology through the use of Availability Local Natural Resources*. 47th STAN Annual conference proceeding. .152-155.
- Wuyeo, S.N. (1997): Teaching and Learning Integrated Science through Activity Based methods at the Elementary and Junior Secondary schools. *The Jos Journal of Education*, 2 (1), 16.