

Methods of Teaching SCIENCE, BASIC TECHNOLOGY AND COMPUTER STUDIES

Edited by

**Professors: I. O. Abimbola, A. S. Olorundare,
M. O. Fajemidagba, Esther O. Omosewo, S. A. Onasanya,
Dr. M. A. Fakomogbon & Dr. N. A. Adedokun-Shittu**

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CHAPTER 1

AIMS AND OBJECTIVES OF TEACHING AND LEARNING BIOLOGY IN NIGERIA

A.R. Ahmed

Introduction

Biology, one of the science subjects, is the study of life that deals with living things. It is broadly divided into Zoology (the study of animal life) and Botany (the study of plant life). Subdivision of these Sciences includes: Cytology, Histology, Anatomy, Morphology and Embryology, to mention but a few. The methods of other sciences are brought into the study of Biology, such as Biochemistry, Biophysics, Bioengineering, Biometry and Biostatistics. All these subjects are studied theoretically and practically. (Questia, 2015). Biology Education is the education that serves both individual and social roles by inculcating knowledge and the right attitude for the survival of both individual and society at large. This is the reason why the themes of biology at the secondary school level have direct relevance to the society and the learners. (NERDC, 2009).

Educational planning and curriculum development at various levels of education in Nigeria, lesson plans and actual teaching and learning interaction taking place in the classrooms are based on the aims, goals and objectives of education. The entire educational system is devoted to achieving the aims, requiring a long-term and even a lifelong frame. The objectives are drawn from goals and ultimately the aims. Objectives offer the step by step educational outcomes that will be cumulatively achieved within a short time. Hence, objectives give direction as to what has to be achieved before aims and goals could be ultimately achieved (Okunloye, 2009). For example, the aim is general and long term. It is formulated for the education of a country. The goal is more specific than aim, but more general than objectives. It can be formulated for a course of study. The objective is the most specific which can be formulated for teaching a topic in the classroom. While aims and goals are useful to the curriculum developers, objectives are useful for classroom teachers. (Abimbola, 2009).

Aims and Objectives of Biology Teaching in Nigeria

The aims of biology teaching, according to the National Policy on Education (2013) include the following:-

- a) To develop in the student, a skill in scientific thinking;
- b) To help students develop the scientific attitudes which include;
 - i. Willingness to suspend judgment when evidence is lacking.
 - ii. Eagerness to seek out evidence on which opinion must rest.
 - iii. Readiness to alter one's views when new evidence demands it.
 - iv. Respect for the view of others, however different they may be, provided they are on facts.
- c) To help students understand the facts, principles and theories of biology (as set out in the syllabus); and
- d) To help students appreciate the relevance of biology studies of everyday life and to have a better understanding of cognate science.

Also, the NECO syllabus in biology (2008-2012), has the following aims and objectives:-

- i. Mastery of the structures and functions of living organisms;
- ii. Appreciation of nature and the need for its conservation;
- iii. Acquisition of adequate laboratory and field skills in biology necessary to carry out and evaluate experiments and projects in biology;
- iv. Ability to observe, classify and interpret biological data (scientific skills);
- v. Acquisition of meaningful and relevant knowledge in biology as pre-requisite for pursuit of careers in biological sciences and related disciplines;
- vi. Acquisition of acceptable scientific attitude to problem solving; and
- vii. Ability to apply biological knowledge taught in everyday life in personal, socioeconomic, environmental and community health (p 39)

Furthermore, the objectives of Senior Secondary School Certificate Examinations in biology by the West African Examinations Council (WAEC, 2015) are to assess candidates in the following:-

- i. Understanding of structures and functions of living organisms as well as appreciation of nature;
- ii. Acquisition of adequate laboratory and field skills in order to carry out and evaluate experiments and projects in Biology;
- iii. Acquisition of necessary scientific skills for example observing, classifying and interpreting biological data;
- iv. Acquisition of the basic relevant knowledge in biology needed for future advanced studies in biological sciences;
- v. Acquisition of scientific attitudes for problem solving;
- vi. Ability to apply biological principles in everyday life in matters that affect personal, social, environmental community health and economic problems; and
- vii. Awareness of the existence of interrelationships between biology and other scientific disciplines (WAEC, 2015.P.1)

Aims and Objectives of Learning Biology in Nigeria

Learning biology can have various aims and objectives. Biology is learnt so that biologist can enter biology-based professions, such as Medicine, Microbiology, Life Sciences and Science Education are such fields. Other aims of studying biology are intellectual, ethical and pragmatic: to increase knowledge about all characteristics of living things, to encourage greater kindness in the relationship between humans and the natural environment, and to implement biological factors in various fields with numerous technologies or management techniques. Such aims and objectives include:-

Understanding Living Systems and Critical Thinking

The study of biology aims to increase understanding of living system. Living system in the body include respiratory, digestive, reproductive, excretory, to mention a few. It also helps to enable biologists consider the systems in relation to self and other organisms in the natural environment. The goal is to be able to test theories developed about living things by employing scientific methods and then to apply the

new information in a beneficial way to the individual and the society. Critical thinking is one of the skills required to give an individual ability to assess and transform theoretical knowledge to authentic learning experiences. The increasing needs of the Nigerian citizen to compete in the global economy requires that they must be equipped with critical thinking, which involves a cognitive process of evaluating, analysing and interpreting information.(Olawuyi, Olasehinde-Williams, Durosaro, and Yahaya,2011)

Applications of Biology in the Field of Health Care and Education

Biology has many applications, both in the natural environment and the environment of health and education. Field biologists also called ecologists use biology to understand relationships between living organisms and their environment. Studying biology allows health care workers to understand the living systems of the body and to apply the knowledge in direct ways to recover and maintain the physical health of both animals and human patients Also, in health care, to notice what is beneficial and what is imbalanced in man's diet and as well as what is dangerous to their health, for proper and appropriate care. For instance, exposure of man to good water, pure atmosphere with fresh air and good hygiene helps to maintain better health. Educators rely on biology to teach the study of life to future generations. Thus applying of such biological knowledge plays significant roles in the nation building and development.

Learning Biology for Research Purposes

Learning biology prepares one for career working in either educational institution or industry where one can be directly involved in conducting research and production of drugs, food-related items and biotechnology. Such career in Nigeria, for instance, is found in Standards Organisation of Nigeria (SON) and National Agency for Foods, Drugs Administration and Control (NAFDAC) and many others. Also, by studying biology one can be qualified to work for the government in managing environmental research on animals and plants; for instance, in controlling the Green House Effects, river systems or biological waste, ecological management for pollution control. Researches have demonstrated that with application of biotechnology in agriculture, many varieties of plants and animal hybrids are produced through crossbreeding and gene manipulation.(Cole-Turners,2003). These have solved the problems of pests and diseases through the production of tolerant and resistant varieties of plants and animals. With application of the gene manipulation in health matters, various organisms are able to build immunity and thus increase their life span. Not only has this helped plants and animals with biotechnology in reproduction, couples without children now have hope of having children.(Fatunbarin,2006).

Integration of Biology into Computers, Business and Communications

Another objective of learning biology is to be able to integrate biology into the fields of technology, law and business. By studying biology one can learn many of the skills needed to succeed in business and communications, such as problem

solving and project management. Biology is integrated into computers with bio-informatics. These are enormous for teachers, students and the society.

Conclusion

The teaching and learning of biology at all levels of education in Nigeria are to attain good objectives, Such teaching and learning should be geared towards the attainment for the benefit of individuals and the Nigeria society at large.

Revision Questions

1. Discuss the relevance of teaching and learning of Biology to individuals and to Nigeria as a nation
2. Define the following concepts and tabulate their similarities and differences.
 - i. Aims;
 - ii. Goals;
 - iii. Objectives.
3. Compare and contrast the objectives of teaching biology by NECO and WAEC in Nigeria.

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