POOR PERFORMANCE IN SCHOOL CERTIFICATE BIOLOGY: CAUSES AND SOLUTIONS

S. O. Banjoko
Department of Biology
Ogun State College of Education
Ijebu-Ode

Introduction

Olowookere (1986) observed that Biology plays a part in education for two reasons namely because of its own significance and because it is a part of the major fields of science. According to him, Biology shares many of the characteristics of other sciences, offers knowledge of direct value to the growing individual, and appears to have special significance in connection with training in scientific method. Furthermore, for any student who intends to study medicine, Biochemistry Pharmacy, Nursing, Microbiology etc biology must be passed at the credit level, at least in ordinary level. Biology is one of the sciences needed for the technological development of the country. However inspite of the importance mentioned above several studies revealed that poor performances were recorded in the subject. Few examples of such studies are stated below. Soyibo (1987) discovered that students performances in School certificate science examination has remained consistently poor and that while biology annually had the highest enrolment it had relatively the poorest results. Similarly Torkhukerhijo (1984) observed that Biology always records the highest number of candidate and highest number of failure. Ibegbulam (1980) also noted that performance over the years have not been spectacular in spite of the popularity of Biology among both science and arts oriented candidates.

It is for these reasons (Biology's compulsory status and students' mass failure) in addition to the fact that the subject deals with living organisms with which students interact that one is willing to look at the causes of failure in ordinary level Biology and offer solutions.

Causes

Causes of failure in ordinary level Biology shall be looked into under the following sub headings

Teacher

Soyibo (1987) stated that the abstract nature of science, the quality and quantity of science teachers, teachers attitude to science, teaching and teaching style were some of the several reasons that account for our students' poor performance in science. He held a strong view that the teacher factor (such as their quality and quantity) is one of the most critical conditions that determine students' performance in any school subject.

Onyejekwe (1984) earlier identified unqualified inexperience teachers as one of the causes of poor performance in O/L Biology.

Misconception of biology concepts by biology teachers is not unconnected with the poor performance of students because the wrong concepts are passed on to the students. Soyibo (1987) confirmed this when he tested NCE and University graduate biology teachers in Secondary Schools on the following concepts: diffusion, osmoregulation, warm blooded organisms, external respiration, osmosis, excretion, respiration, photosynthesis, seed, fruit and fertilization. He concluded that:

(a) Teachers' knowledge of the biology concept tested was below average.

(b) Their poor knowledge derives partly from the existence of misleading terms in biology texts and syllabuses.

(c) The teachers seem to have replicated the same knowledge of the concept which they had acquired during their secondary schools days.

Among the reasons given by the committee set up to investigate the causes of poor performance in May/June 1982 School Certificate Examinations was that recent Biology questions cover a wide area of syllabus including topics considered difficult and generally skipped by teachers. To support this Adeniyi (1983) listed Genetics, Hormones, Ecology and Skeleton as some of the topics perceived difficult in secondary school Biology.

Students (and Parents)

Soyibo (1982) stated that students regard biology as the easiest of the science subjects and they presume they could pass it with little effort. He observed further that their poor performance was related to their carefree attitude toward biology. As a result these students don't give enough attention to their teachers and some may even not come to biology classes. Hence when examination comes they go all out looking for how to pass by all means including cheating. Fakunle (1984) rightly identified this when he noted that social environment is stinking with corruption in the home, in the school, in places of work and everyday. Hence the child is a product of our environment. Therefore evils of the society including examination malpractises. He further observed that the inferiority complex to which anyone that fails any examination is subjected to in the school, in the home and in the society would make the individual go to any length to pass examination in Nigeria, and when caught he fails the examination.

Students weakness and dislikeness for biology practicals is one of the causes of poor performance in biology in ordinary level. Areola (1983) evaluated students problems and weakness and found them to be the following:

(a) inability to follow instruction;
(b) wrong spellings
(c) inability to observe details
(d) inability to draw inferences from experimental results.
(e) inability to make good drawing;
(f) inability to draw to scale

Laboratory

Most laboratories are not adequately equipped for science teaching. (Orisaseyi 1979, Oni 1984). Aghenta (1983) also mentioned poor state of science laboratories as one of the reasons for poor performance. The situation of biology laboratories in Nigerian schools is not different from the above and this is one of the reasons for poor performances in O/L Biology examination. Biological materials/equipment necessary to teach practical are just not adequate.

Syllabus and Textbooks

Biology textbooks have been far too difficult for children for who they are intended. Infact, until recently, the common biology textbooks were written by foreign authors with foreign examples hence students could not understand them and this is also not unrelated to the poor performance of students.

Improvisation and Teaching Aids

As rightly pointed out by Onyejekwe (1984), most of the science teachers in secondary schools hardly use teaching aids except the student teachers on practical teaching, hence student don't understand fully what is being taught. Infact science teaching in Nigeria was done as rote learning with little relationship to the day to day life of the pupils.

Solutions

Teacher

There is no doubt that teachers have a big role to play in improving the performance of students in ordinary level biology examinations. Therefore the teachers should be well knowledgeable above the students in biology. The training and retraining of our biology teachers must be overhauled to enhance effective teaching and learning.

There should be a conscious effort on the part of the teachers to reduce the use of technical terms to a minimum Teacher should encourage the pupils to find out the meaning of technical terms.

For proper understanding of the structural arrangement of an organism, three dimensioned perception is important (Olowookere 1986). Differences between two and three dimensional specimens is important and students should be assisted to note this. Among the methods that may be used includes ask them to draw not only the transverse section but also longitude views. Students should use plasticine or clay in structure modelling as well as drawing. Students should be encouraged to make simple diagnostic models. According to Haggis (1965) the pupils should be led by means of question, observation, experiment and induction to come to an under standing of some of the scientific principle and facts related to the world in which he lives in order to develop scientific inquiry spirit. Teachers should help the children to interpret the world in which they live through well developed and well taught units, organise science concepts and children's problem solving methods involving many fields of science like the instructional programme which must be constantly modified to insure a modern interpretation based on recent discoveries in science.

Teachers should not be static but current with changes in scientific names (e.g. Ecologists now know that *Eupatorium odoratum* is now known as *Chlorophytum odoratum*, similarly the common okra formerly known as *Hibiscus esculentus* is now *Abelmoschus esculentus* (Olowookere 1986). This should be noted by the teachers and they should inform their students before writing

their examinations. Furthermore teachers should help the students at the ordinary level to know and understand that Biology can be reduced to a number of broad statemens known as fundamental Biological principles.
Examples are:

(a) Principle of cellular organisation which means that living things differ from non living things in that they possess a definite cellular structure.

(b) Principle of metabolism which means constant building up and tearing down in the body of every living organism.

(c) Principle of growth meaning living things grow from within, through changing food into living protoplasm and new cell walls and/or cell membranes. Other principles are principles of adaptation or ecology, principle of distribution, principle of reproduction, principle of heredity, principle of evaluation, principle of classification, principles of Balance in Nature, principle of homeostasis and principle of behaviour (Olowookere 1986).

The most crucial determinant of a teacher's professional competence is his academic ability or knowledge of his subject of specialisation. He has to be hardworking to meet the demand of science teaching (Torkhukerhijo 1984). Biology teachers should show competence in the teaching of the subject. Teachers have areas of interest and specialisation. Therefore, for good and effective coverage of the different parts of the syllabus before examination, more than one teacher is necessary for the teaching of biology at the senior secondary school level and for effective team teaching. Teachers should let students know how to answer examination questions in biology, accurate method of drawing, using of scale, magnification etc. that are necessary in biological drawings.

Students (and Parents)

Active participation and involvement on the students part in Biology practicals at the ordinary levels is very important. In practical class and examination, students should record and report what is seen in an experiment and not what is supposed to be seen or what they have read in the textbooks.

Parents should also ensure that their children have the necessary texts for biology (Torhukerhijo 1984).

Laboratories

The importance of biology laboratory and biology practicals cannot be over emphasized at the Secondary school level. Teachers complain of scarcity of science teaching equipment in general (Torkhuekerhijo 1984). Therefore there is a need for a well-equipped laboratory. At the secondary school level practical work should not be a bore. It should be a session that pupils should be looking forward to. The practical on ecology should be based on the field than in the laboratory. Aquarium, wormeries, insect and animal cages etc. should be available in the laboratory.

Laboratory technologist must know exactly what specimens to collect for practical class or examination because if wrong specimens are given to the students, it is the given specimens that will be identified and worked upon thereby resulting in failure.

Syllabus and Textbooks

Considering the West African Examination Council Syllabus there is the need for improvement with the aim of removing misleading terms.

The curriculum itself should not be a static thing, it should be dynamic, and most importantly, should have relevance to the learnings, society and the nation. It is in this light that the efforts of the efforts of the science Teachers Association of Nigeria (STAN) in the following areas are noteworthy.

(a) Conversion of W.A.E.C. Examination Syllabus into a Teaching Syllabus;

(b) Development of science curriculum with State and Federal Ministries of Education, Institutes of Education in Nigeria Universities, W.A.E.C. Nigerian Education Research Council (N.E.R.C.), Nigeria Teachers Institute (N.T.I.), CESAC and the Nigerian Academy of Science;

(c) Provision of Science textbook, teachers guides and pupils' workbooks for use in schools;

(d) Organising workshops and seminars for science teachers to improve their teaching skills and competence and update their knowledge, among others.

Misleading terms should be removed from new editions of biology textbooks. Emphasis should be based on local examples of materials. Furthermore areas considered difficult for students like internal features of plants and animals,

heredity and ecology (Areola 1983, Adeniyi, 1983) should be accorded more time for coverage or be started earlier in the programme.

Improvisation and Teaching Aids

There is the need for the teachers to be resourceful and to use improvised materials when he/she cannot get the most appropriate materials. In our secondary schools Modern teaching aids in Biology are also important at the ordinary level, The importance of audio-visual aids in learning is illustrated by the following event. The film "Accent on Learning" showed clearly how an instructor in the school of medicine at Ohio State University first showed a model of a heart to a class, noted its position in a skeleton, then presented a large chart of the heart, next outlined it on the bare chest of a students, then demonstrated the sound of the heart by having students listen through a stethoscope. Therefore though proper use of effective and appropriate visual aids in our secondary school biology, the problem of rote learning from textbook will be greatly reduced. This view was supported by Friedlander et al (1974) study on the effect of Television and Audio on comprehension. They found that students listening comprehension is substantially influenced by presentation variables. Teather (1978), cited the case of a short residential course for medical practitioner held in New Zealand and observed that audio visual aid facilitate discussion between the participants about ways in which they normally handled certain types of counselling problems.

Olowookere (1986) listed the following as few of the modern gadgets that may be used to improve the teaching of Biology in Secondary Schools. Overhead projector, slide projector, photo-micro graphy, moving picture projector, models pictures, mounting of wall charts, labels and colour, stereogram, motion picture, electron-micrograph, microscopes, insect catching nets. Teachers should use appropriate and effective aids to drive home their points instead of traditional method of rote learning or lecture method.

Conclusion

Improved performance and good results in ordinary level examinations will no doubt lead to increase in the number of students studying sciences and biology related courses in Nigeria's tertiary institutions. This would contribute positively to our technological development and good environmental sanitation. All those concerned at improving the standard of performance in biology should contribute in whatever way they may deem fit.

Government should provide good and well-equipped laboratories. Teachers

should show more interest in biology by participating in practicals and reading of journals and other resource materials, W.A.E.C. should revise their syllabus periodically. Author of textbooks should be more explicit and use local examp and specimens and where applicable audio-visual or appropriate teaching aid.

Finally, an intellectual atmosphere must of necessity not only include infrastructural facilities viz; water, electricity, equipment, chemicals, good libraries etc., but also well - motivated teachers, scientists, technologists with appropriate skills, attitudes and orientation (Ogunniyi 1993)

REFERENCES

Abdullahi, A. *Science Teaching in Nigeria.* Atoto Press Limited Ilorin. 1982

Adeniyi, J. A. Isolating Topics of high perceived difficulty in Secondary School Biology. Unpublished M.Ed. Project 1983.

Adekoya, Wale, "Effective use of instructional materials in the teaching of Mathematics in Secondary Schools in Ogun State. A seminar paper presented in the School of Pure Sciences ogun State College of Education, Ijebu-Ode. 1989

Adekunte, G. O. Speech delivered at the opening of the Governing Council meeting of STAN held at the Ogun State Hotel 1987.

Aghenta, J. A. "Why there are not enough science applicants for university admissions in Nigeria", *Journal of STAN* Vol. 20, No. 2 1982, Pg. 90-99.

Areola, E. O. Evaluation of Students Problems and Weakness in Biology Practical. Unpublished M. ED. project (1983).

Balogun, T. A. Improvisation of School Science Teaching Equipment *Journal of STAN* Vol. 20, No.2, 1982.

Banjoko, S. O. "Resources in Science Education at the University Level" A seminar paper presented in the department of Teacher Education University of Ibadan, 1984.

Blumetal, 1979, (See Onyejekwe E. N. Opcit 1984)

Fakunle, J. O. "Psycho Analysis of Examination Malpractices". A seminar paper presented at the Department of Teacher Education (1984).

Friedlander et. al. The Effect of Live-v and Audio Story Narration on Primary Grade Children's Listening Comprehension". *The Journal of Educational Research* Vol. 68. No. 1, September 1974 pp. 32.

Haggis, S. M. Finding Out in Science (A handbook for the teacher (published by the syndicts of the Cambridge University Press Benthey House London 1965.

Hornby, A. S. *Oxford Advanced Learners Dictionary of Current* English London 1974.

Ibegbulam, C. A. "Effects of Orienting Stimuli on the Attitudes and Achievement in Biology of a Group of Nigeria Secondary School Pupils" Unpublished Ph.D. thesis. 1980

Ogunniyi, M.B. "Science Education: The Basis to Realistic Scientific and Technological Development". A paper presented at the 24th Annual Conference of Science Association of Nigeria April, 1983.

Okoye, N.N. Why Student Fail Examination Psychology for Every-Day living Vol. F No. 1 1982.

Okoye, N.N. Psychology Theories of Learning Ibadan University Press 1982.

Olowokere, J. O."Biology as a Science" Text of a lecture delivered at the final Zonal Scientific exhibition organised by Biology Teacher Association (Ijebu-Zone) 17/3/86 at A.G.G.S., Ijebu-Ode.

Oni, "Achieving much with U.I." Sunday Sketch Newspaper 20/5/84.

Onyejekwe E. N."Scientific Inquiry - An Approach to Science Teaching. A seminar paper presented in the department of Teacher Education University of Ibadan, 1984.

Orisaseyi 1979 (Quoted in Torhukerhijo, H. E. Opcit 1984).

Orlan 1968, Orian 1972 (See Onyejekwe E. N. Opcit).

Raji, I. O. An Investigation Into the Problems of Resources and Their Utilisation in the Teaching of Biology in Irepodun and Ekiti Local Government Area of Kwara State. Unpublished M.Ed. Thesis U. I. 1982.

Soyibo, K. Relationship Between School Certificate Pupils Attitude and Their Achievement in Biology. *Journal of STAN* Vol. 20. 1982 pg. 26-32.

Soyibo, K. An Analysis of Some Biology Teacher Knowledge of an Misconception on Selected Biology Concept" Paper presented at W.A.E.C. Seminar Friday 30/1/87 at W.A.E.C. office Yaba lagos.

Teather, B.C. "Audio-Visual Media and Educational Technology in the Traditional University" *The Internal Journal of Higher Education.* No. 4. Vol. 7 Nov. 1978 pp. 431.

Torkhukerhijo H. E. An Investigation Into Possible Reasons for Some Possible for Poor Performance in School Certificate Biology. A seminar paper presented in the department of Teacher Education University of Ibadan, 1984.

Willkin, E. Education in Practice Evans Brothers Ltd., 1975.