THEORETICAL AND PRACTICAL STRATEGIES IN TEACHING AND LEARNING OF AGRICULTURAL SCIENCE IN NIGERIAN SECONDARY SCHOOLS

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ABSTRACT
The perennial food shortage in Nigeria can be a thing of the past if agricultural science educators can adopt both the theoretical and practical strategies in teaching agriculture in secondary schools. This paper takes a look at the strategies that would bring about better performance of agricultural science students in secondary schools in Nigeria. Some of the strategies examined include Lecture method, discussion method, raising of birds, rearing of goats, rabbit production and the use of field trips/excursions.

INTRODUCTION

Nigeria has not been able to produce enough food for the teeming population despite all the agricultural development programmes put in place by the government to increase food product (Okoh, 2008). About 70% of the Nigerian population reside in rural areas depending largely on agriculture for sustenance (Federal Office of Statistics, (FOS), 1999; Gana, 2001). Due to the large percentage of the population presently deriving their livelihood from agriculture and the need for students to perform very well in the secondary schools examinations, it now demands that agriculture in schools should offer full integration of theory with practice. The integration of theory and practice would produce a meaningful impact on agricultural production and eliminate hunger from the populace.

The National Policy on Education (Federal Republic of Nigeria (FRN) (2004) envisaged that the training for occupation at the junior and senior secondary schools should be basically prevocational. The senior secondary school (SSS) programme is related directly to the junior secondary schools (JSS) programme such that the concepts introduced at JSS are further dealt with at the SSS to produce a graduate development of concepts and enhance the learning and comprehension of students. The overall objectives of agriculture science programme at the secondary school are to provide adequate orientation for the integration of Agricultural Science with productive work at schools and to prepare students for future activities in Agriculture. The teaching/learning situation in Nigerian secondary schools need to be optimal for 'guided discovery'; practical, exploratory and experimental methods of teaching have been suggested (Federal Ministry of Education (FME), 1985). By so doing, the learning-by-doing will be emphasized and the students are able to produce, process, preserve and market food and other agricultural products for themselves and their community.

According to Olaitan(1985) a teacher of agriculture is expected to deal with the cognitive, psychomotor and affective out comes of the subject and looked upon as a master of definite skill.

THEORETICAL STRATEGIES IN TEACHING AGRICULTURAL SCIENCE IN SECONDARY SCHOOLS

The teaching of Agricultural Science in the Secondary Schools could be done through theoretical/verbal presentation. Some of these strategies that could be adopted include (i) lecture method (ii) discussion/conference method and (iii) demonstration method.

(i) Lecture Method:

The lecture method is an oral presentation of facts and ideas by a teacher. It is the oldest method of teaching and still in use in many institutions in Nigeria today. The lecture method is essentially teaching outside the manipulative work. In this method, the teacher does most of the talking while students listen

and take down notes. Students are therefore, passive participants, while the teacher is active. The teacher may use audio-visual aids in illustrating his/her lesson.

According to Olaitan (1985) the traditional lecture method should be supported by concrete teaching aids such as charts, pictures, audio-visual tapes and self instructional guides. Therefore lecture method should be done together with teaching aids to be more effective. For example if a teacher is giving lecture on organic manure, to make the lesson more meaningful, the teacher should provide decomposed animal dung or plant materials to serve as a specimen of organic manure. A verbal description of gully erosion site is not as informative as a photographic evidence of the actual erosion site (Olaitan, 1985). It is when the lecture method is used with the teaching aids that the lecture would be of greatest meaning to the students.

(ii) Discussion/Conference Method:

Discussion is an oral exchange of ideas. According to Olaitan (1985), discussion involves a group of people or a class who get together in order to exchange ideas, facts and opinions about a topic of mutual concern and interest. The teacher acts as a conference leader or a moderator and directs or redirects ideas and information produced by the students in the class. The teacher listen to what is said by each individual students in the group as this gives an insight into his/her level of knowledge and understanding of the subject matter. For example if a topic such as "types of soil" is under discussion in the class, to make the topic more clearer and meaningful, the teacher could bring the different types of soils (sand, clay, loam) to the classroom during discussion. Discussion therefore is based upon extensive construction of ideas and expressions from members of the groups participating in the discussion. It provides for effective participation of the learners. It involves teacher-student; student-teacher and student-student interactions.

(iii) Demonstration Method:

Demonstration is an audio-visual explanation, emphasizing the important points of a product, a process or an idea (Okoh, 2008). Demonstration most often combines sequential explanation with a practical illustration of, for example, the handling or operation of a piece of equipment or materials (Olaitan, 1985). It is an activity which combines telling, showing and doing for the benefit of an audience. Demonstration is probably the greatest teacher's asset in arriving at fundamental skill and practices.

Demonstration method can be used conveniently in very many topics in agricultural science. For example field demonstration can be carried out by the teacher on the planting of maize, date of planting, spacing, seed rate, planting depth among others. Demonstration can also be carried out in the field to show the beneficial effects of fertilizer application on maize plant. There are many other agricultural science topics that can be effectively demonstrated in the field such as thinning and pruning of vegetables and the transplanting of oil palm seedling in the farm site. This will make learning more meaningful to the students.

PRACTICAL STRATEGIES IN TEACHING AGRICULTURAL SCIENCE IN SECONDARY SCHOOLS

Agricultural Science Programme is practical oriented and therefore requires a lot of practical work. Emphasis should therefore be placed on the teaching of agriculture in Schools so as to produce manpower to meet Nigerian's increasing food needs. Some of the practical strategies for teaching Agricultural Science in Schools include – (i) Use of farm plot/school farm, (ii) raising of birds (poultry) (iii) Rearing of goat (iv) Rabbit production (v) Field trip/excursion (vi) Supervised Occupational Experience.

(i) Use of Farm Plot (School Farm)

The School farm acts as a laboratory where students can acquire practical skills of farming (Olaitan, 1996). The school farm is of vital importance to any school/college with agricultural programmes. In the school farm, the students are allocated plots of farm land for planting of different crops. Marks are allocated to the students, according to the performance in their individual plots of farmland. The students are expected to plant crops such as maize, groundnut, cassava, and vegetables among others. This will expose, the students to acquiring the necessary skills and knowledge in agricultural production.

(ii) Raising of Birds (Poultry)

The term poultry as it is used in agriculture generally refers to all domesticated birds which are kept for meat and egg production (Komolafe, 1985). These birds include all types of fowl such as chicken, turkeys, ducks, guinea fowls, geese and pigeons among others. However, the most popular ones raised under the traditional and modern systems are the chicken. A school should have a constructed poultry house where the students can acquire skills in poultry production. Marks should also be allocated to students according to their performance in the poultry house. Poultry management could be practiced under the intensive system, semi-intensive methods and extensive or free range system.

(iii) Rearing of Goats

The rearing of goats in Nigeria has been practiced for many years past. The population of goats in the tropics exceeds the number available in other parts of the world. Goats are mainly kept in Nigeria for meat production. Only few breeds have good ability for milk production. According to Anyanwu (1979) improvement programmes are channeled towards improving milk quality and yield. Meat, hair, and skin productions are secondary to milk production. Goats are noted for their ability to thrive in areas where other groups of livestock find very difficult to live in. They enjoy browsing and free unconfined life. Breeds of goat include West African dwarf, Sapel, Red Sokoto and Anglo-Nubian among others.

The keeping of goats especially the West African dwarf goat should be practiced in the secondary schools since they are easier and cheaper to rear. They are god foragers and can withstand the adverse climatic conditions especially in humid regions of the tropics. A school should have a small plot of land fenced round where the students could practice goat production with the help of the Agricultural Science teacher.

(iv) Rabbit Production

Rabbit production is another practical strategy for the teaching/learning of agricultural science, especially in animal husbandry in secondary schools. The keeping of rabbits as farm animals is not very popular in Nigeria, because its potentialities as a rich-source of protein have not been recognized by many.

However, rabbit keeping has many advantages – (i) it can be fed on a wide range of food items (ii) it does not require highly skilled labour (iii) it is very prolific and the litter size may be as high as 12 (iv) it can convert feed into meat very efficiently.

Rabbits can be kept and reared in individuals rabbit house called “hutches” or in a well designed system of hutches inside the school building or laboratory. Students would acquire the skill and knowledge of rabbit production in their schools where rabbit production is being practiced.

(v) Field Trip/Excursion

The field trip is one of such practical method that is used for the teaching and learning of Agricultural Science in Secondary Schools. Agricultural Education Programme is a programme which involves practical activities that are carried out outside the classroom. If effective teaching and learning of agricultural science is to be achieved there is need for out-of-class learning activities.

An interesting agricultural science class cannot be confined to the classrooms alone. This is because most of the students would not be able to grasp most of what they learn unless adequate field trips and practical work are embarked upon. Most of the topics in agricultural science are practical in nature. According to Okoh (1999) practical agriculture is oriented towards self-sufficiency in food production and this can only be achieved through the inculcation of appropriate skills and attitudes to the youths.

Field trip is undertaken in order to practically see what has been taught in theory in the classroom thus enabling the student to actually see things in real life situation and arouse their interests. According to Olaitan (1985), field trip is a planned visit to places outside the regular classroom to obtain information directly and to study real life situation. This method gives the students experience of seeking, working and drawing conclusions from sources. The aims of field trips as identified by Falk and Baling (1980) include;

i. Enabling students to see and think;
ii. Enabling students to acquire knowledge and
iii. Making the students identify problems in the study of a given subject.

Table 1: How to use Field trip to Teach Topics in Agricultural Science

S/N	Units/Topics	Method/Technique
1. i. ii. iii.	The meaning scope and importance of agriculture Definition Importance to man Agriculture as a business	Field trip to a commercial farm and look at farm management records and operation charts
2. i. ii. iii. iv. v	Farming/cropping systems; Land rotation Crop rotation Mixed cropping Mixed farming Pastoral farming	Field trip to school farm and peasant farms to evaluate the systems practiced in the area.
3. i. ii. iii. iv.	Agronomy of root crops Yam Cassava Cocoyam Potato	Field trips to crop production centres.

Source: (Olaitan, 1985 in Okoh, 2001)

Table 1 above explains how field trip as a teaching method could be used to teach some topics in Agricultural Sciences subjects. Each units or topic has a teaching method which is most appropriate whether in the field, the laboratory or the classroom.

Field trips must be closely related to the topics which the students are being taught in the school. According to Laogun (1981) field trip as a teaching method has the following stages.

i. Activities before the trip (planning of the visit)
ii. Activities during the trip (the main visit), and
iii. Activities after the visit (organization of information and evaluation of the results of the visit).

(iv) Supervised Occupational Experience Programmes (SOEP)

The Supervised Occupational Experience Programme (SOEP) is one of the practical strategies used for the teaching and learning of Agricultural Science in schools. Though the concept of SOEP as a teaching method for agricultural science has not received enough emphasis in the Nigerian educational system as it is done in some developed countries. According to Ogbazi (1996) the supervised occupational experience programme is a planned series of related learning experiences which is an integral part of the instructional programme of a student enrolled in vocational agriculture. The SOEP therefore, is designed to develop knowledge and practical skills in agriculture. SOEP is regarded as an outside classroom activity which is performed by students who are enrolled in Agricultural Education Programme (Okoh, 2001). It is an individualized programme of instruction in agriculture. It enables the students to apply what they have already learned in the classroom and laboratory to real-life situations.

In SOEP students are allowed to establish an agricultural project such as poultry project and vegetable project among others, outside the school system. This project will be supervised and coordinated by the Agricultural Science Teacher who will be visiting the students from time to time to make some corrections. The projects could also be supervised by the parents of the students and/or the community. The students are therefore, advised to take up projects which are of interest to parents and the community. While on the project, the students occasionally bring their problems and findings to the classroom for discussion so that members of his/her class group can contribute to the discussion.

Exhibitions are also organized by the school where the students are allowed to display their products and marks/prizes are awarded to the best “student farmer”. SOEP therefore, is an excellent method of providing for young people a practical education and skill foundation which will prepare them for economic survival.

CONCLUSION

In order to attain greater heights in the teaching/learning process in Agricultural Education Programme in the Country, multidimensional approaches involving the students, teachers and the government as well as their ingenuity, resourcefulness and dedication must be adopted. The teachers of Agricultural Science must emphasize skills development teaching methods and regularly utilize relevant instructional materials especially concrete objects.

Agricultural science teachers should therefore, organize field trips/excursions, field practicals and promote good working relationship with out-of-school agricultural farms and agro-allied industries. The establishment of a school farm, rearing of poultry, goats and rabbits in the school compound is very imperative. For effective teaching and learning of agricultural science in secondary schools, verbal/theoretical instructions should go hand-in- hand with the practical strategies.

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