

The Need for the Utilization of Instructional Materials on the Teaching and Learning of Agricultural Science Education in Developing Countries

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Abstract - This paper dwelt on the need for the utilization of instructional materials with highlights on the type of instructional materials, selection, uses and their importance on the learning and teaching of Agricultural Science Education in developing countries. It further discussed the concept of improvisation with some recommendation in terms of availability, utilization on the teaching and learning of Agricultural Science Education.

Index Terms - Instructional Materials, Agricultural science Education, Improvisation.

1. Introduction

To begin with, education is the process through which knowledge, ideas, skills and values are transmitted from one generation to another (Fafunwa, 1999). The educational systems of any democratic society must perform a positive and dynamic role in the perpetuation and improvement of that society, the school curriculum must possess the ingredients that can equip the learner with employable skills for the world of work, with entrepreneurial understandings, attitudes, habits, behavior and appreciation that will contribute towards Agricultural development in the societies. It is for this reason that agricultural education was introduced into the school systems from primary, secondary to university levels.

The concept of agricultural education has been viewed by different authors, according to, Agbulu and Wever (2011) defined agricultural education as a systematic programme of instruction for school leavers, out of school, post secondary youth, and established farmers organized for the purpose of improving agricultural methods to prepare students in developing their abilities to make a beginning in the farming enterprise. Osinem (2007) perceived agricultural science education as a process of imparting knowledge, skills and attitudes in agriculture to the learner at all levels.

Furthermore, agricultural education is not restricted to local farming activities but involves related business (agri-business); such as selling of farm inputs, transportation soil testing, machine servicing and mechanized activities in farming. In a well organized programme of agricultural education citizenship programmes, consumer education, special education programme for the handicapped which is applied are often provided for students.

Generalizing from this conception, agricultural science education is an integral part of general education used to instill in students, desirable attitudes, knowledge and skills to enhance social sensitivity and resourcefulness in students.

The introduction of agricultural science education at the different levels of education is aimed at the following objectives;

- 1) To stimulate and sustain students' interest in agriculture and vocational competence.
- 2) To enable students acquire basic knowledge and practical skills and appropriate communication skills.
- 3) To enable students integrate knowledge with skills to establish and manage a model farm effectively.
- 4) To prepare students for studies in agriculture at all levels.
- 5) To expose students to occupation in agriculture
- 6) To prepare students for opportunities in the field of agriculture with sound background.

Based on these agricultural education has been given recognition towards achieving positive attitudes amongst the youths and future generation in third world countries.

The teaching and learning of the subject at all levels is based on methods where students discover and interpret problems, develop desirable attitudes, interest and application which can be used in solving problems of agricultural interest in the a developing society. This has placed a great demand on the use of instructional materials for effective teaching and learning of agriculture particularly in countries where development is at its lowest ebb.

Since agricultural education is aimed at providing skills attitude for employability its teaching and learning must be given top priority and adequate attention at all levels. This can be achieved through the use of instructional materials as it is a practical oriented vocational subject which is a learn by doing subject.

Fadaiye (2005) in Ekoja and Ekoja (2012) agree to this fact that learners learn best when they are actively involved practically rather than when learning is done passively. Fadaiye's views are in line with Jean Piaget (1950) who stated that people learn through active exploration and that learning occurs when learners uncover inconsistency between their current knowledge and past experiences and that learning is done via three stages of direct experience, at iconic level and symbolic levels, real experiences are substituted with images and pictures of real things while the object for teaching an event is converted to symbols which is the level of abstraction which has short comings bridged by the use of instructional materials in real life situations and sometimes direct level

learners are based on what they hear, see, taste and touch with what is being learned.

2. Concept of Instructional Materials

Teaching in the class room environment is no longer restricted to the narrow sense as merely a matter of the teacher addressing learners in a class room in a more comprehensive approach; it is rather the aggregate of interrelated activities. Agbulu (2002) in agreement with Jean Piaget states that if learning takes place at the direct experience level at iconic level and symbolic level. The direct symbolic level is the level where learners see, hear, taste and touch what is being learnt. At the iconic level, real experiences are substituted with images of pictures, showing real things, while at the symbolic level, the event is converted into symbols which bears little or no resemblance to reality. The symbolic level is the level of attraction which has short comings and these shortcomings have been bridged through the use and application of instructional materials in the classroom.

According to Okpara and Ogenyi (2006), the teacher organizes the contents of the lesson using symbols of a given language and appropriate methods and materials to send the subject matter across to the learners for the learners to receive the message, decode and react to it accordingly. The reaction is the feedback and measure of their understanding of subject matter because the message must have produced significant impressions on their senses.

Various school of taught have explained instructional materials in different ways or forms. An instructional material is anything that can serve as an object of interest that a teacher uses for the purpose of passing instructions in the classroom to achieve set educational objectives (NTI, 2006). Instructional materials represent all the alternative channels of communication which we can use to compress and represent information in a more vivid form (Iya, 2005).

3. Types of Instructional Materials

Njoku (2002) stated that the teaching of agricultural science requires the use of some instructional materials depending on the various aspects of the subject. The teaching of animal production requires the use of livestock housing, sick animals from either poultry, sheep's, goats or rabbits; it also requires the veterinary unit, animal health kit containing drugs. The teaching of topics in soil science like soil formation and soil fertility would require the use of rock samples, soil samples and crops raised in the garden with organic manure and fertilizer. They also require simple farm tools, like cutlasses and hoes as in the sub Saharan Africa, fishing nets, hooks, bows and arrows ; samples of herbicides, pesticides, etc.

Egbule (2004) gave instructional materials in agricultural science education as samples of local weeds, seeds, fruits and vegetables, fertilizer samples, soil samples feed samples, chemicals (fungicides and pesticides), root crops, diseased crops, diseased organs of animals, internal parasites of

animals, ecto parasites of animals, crop products, agricultural equipment, animal products and soil micro organisms.

It is therefore necessary for teachers of agricultural education to create avenues for the use of these instructional materials which will instill skills to the students. For effective teaching of agriculture lesson the following instructional materials are necessary;

- 1) **Graphic Materials;** These are materials that summarize significant information and ideas through some combination of drawing, boards, symbols and pictures of desired plant, crops and animals effectively utilized in teaching agriculture lessons are maps, charts, pictures, posters, graphic diagrams and cartoons of desired farm animals and crops.
- 2) **Audio-Visual Materials;** These are instructional materials that appeal to the senses of sight and hearing of the students. Audio and visual simultaneously. They include the radio cassette recorder, television sets, videos, slide and over head projectors and films of farming systems.
- 3) **Printed Materials;** these materials include newspapers, magazines, periodicals, pamphlets, agric textbooks. They are used in obtaining information that will help in achieving the objectives. They can be consulted as a reference material during the lesson period or used by students as source of information for an assignment given after the lesson.
- 4) **Display Materials;** Instruction materials under these categories appeal more to the sense of sight than hearing. These materials can easily be displayed in the classroom for effective teaching and learning. They include chalkboards and flannel boards.
- 5) **General Materials;** They are materials generally used by teachers to promote effective teaching and learning in the classroom. They include things like the world map showing agricultural vegetations.
- 6) **Land laboratory;** This is another form which is necessary especially in the agriculture class for lessons involving experiments and treatments and there must be a readily available farm for the various crops meant for study animals. e.g. ruminants and non-ruminants.
- 7) **Community resources;** These are facilities found within the community and outside the school which can be used to promote teaching and learning. Community resources that can be harnessed for teaching and learning include natural resources like hills, rocks, soil samples vegetation and water for irrigation topics. Human resources e.g. resource person, material resources e.g. food crops of different examples and classification, instructional resources provide important information that enriches the knowledge of both the teacher and the students.

4. Merits of Instructional Materials

Graphic materials; they serve not only as instructional materials, but also have aesthetic values. They serve as decorative materials in the classroom, help to improve the learning environment. Charts make an attractive display in the

classroom. For instance, posters of animals and plants can be used to reinforce what has already been taught.

Display Materials; these are cheap and available. Display materials help the teacher and class to work together with high level of student participation.

Community resources; they provide varieties of important materials for effective teaching and learning. For instance, resource persons bring new ideas and vital information for the benefits of both the teachers and the students. Community resources constitute valuable teaching aids which make teaching interesting and meaningful. It could be an established farm, Orchard, poultry facilities or a feed mill in a community.

Printed materials; provide a more permanent record and are comparatively more economical and portable. Printed materials serve as reference materials. They represent source of educational information and they represent vital objects and materials for teaching and learning.

5. Selection and Uses of Instructional Materials

The nature of agriculture as discipline requires the use of variety of instructional, materials before any meaningful teaching and learning can take place. However, in the course of selecting instructional materials to ensure effective teaching and learning of the subject, the teacher's professional skills and competence must be considered. The teacher being the principal actor in the classroom has the duty to select the most appropriate teaching aids for his instructional activities.

Instructional materials for teaching agriculture should be easily accessible to both the teacher and students. The accessibility of instructional material is one of the major criteria for choosing instructional materials readily available to them. The availability of instructional materials should be considered before recommending them or planning to use them for teaching and learning. In the selection of these materials, agriculture teacher should consider the extent to which the materials are capable of motivating the students to learn. Any selected material should have its appeal to the students and it is necessary that materials used should possess some aesthetic qualities and be clearly and logically presented. In the selection of instructional materials. The teacher should note that every instructional material has definite, unique strength that probably cannot be replicated through the use of another. In selection and uses, the learner's age, sex interest and level of the learner must be considered as it determines the type of material to be used. Facts, statistics, charts, graphs and diagrams of agricultural importance must be reliable and their sources should be authoritative. The use of instructional materials depends on their variety, proper utilization as the materials themselves cannot do much to improve or promote learning without the teachers. The value lies in the professional skills of the teacher in using them. For a proper application the following steps are necessary:

- The teacher's knowledge of the instructional materials
- Preparing the materials available in the class
- Preparing the environment for the lesson

- Preparing for the students and evaluating the materials to be used in teaching.

6. Importance of Instructional Materials on Teaching and Learning of Agricultural Science Education in Developing Countries

The degree to which agricultural science teachers carry out the task of teaching and eliciting meaningful learning in their students is largely dependent on the availability and effective use of instructional materials. This is because instructional materials have tremendous impacts on teaching and learning, in the following ways:

- 1) The availability and effective use of instructional materials create lasting impact on teaching and learning process. Learners must learn best when they are taught practically.
- 2) It equally makes students to be innovative and creative by providing them with worthwhile experience.
- 3) They help promote and improve the effectiveness of communication of ideas by the teacher to the learners.
- 4) They enable the learners to learn through more than one sense, thereby making it more useful and permanent.
- 5) When a wide variety of instructional materials are used in teaching agriculture, they help the teacher to cover topics in the syllabus, this helps in realizing educational objectives of agricultural science.
- 6) Instructional materials generally are relevant, hence they help students with hearing and seeing effects as their usage minimizes teachers domination of the lesson through much talking. They also ensure active participation when the learners are given the opportunity to use and manipulate them.

7. The Concept of Improvisation

The human mind can only accept abstract ideas if only they are derived from concrete examples. Improvisation is the act of using alternative materials and resources to facilitate instruction whenever there is lack or shortage of some specific first hand teaching aids. Akusuba (2005) in Ekoja and Ekoja (2012), defines improvisation as the choice of the best instructional materials which enable the teacher to achieve some carefully specified educational objectives. In practical terms it means the provision of an alternative best which essentially must serve the purpose for which it was intended. Improvisation include methods of producing new materials to replace certain materials not available it is the use of locally fabricated materials to replace refined ones.

8. Instructional Materials that can be Improvised by Agriculture Teachers and Students

The teacher and students can improvise the following list of instructional materials;

- 1) Pictures; This can be improvised through cut out from newspapers and magazines as well as farm house pictures cut out into puzzles for teaching agricultural farming system.

- 2) Teachers and students can produce models of tractors and decorticators using local materials and resources to reinforce a teaching point.
- 3) Posters of plants and animal products can be produced by teachers and students using cardboard sheets.
- 4) Cartoons can be produced by both the teachers and the learners of farmers ploughing the land using papers, cardboard sheets and writing materials.
- 5) Agbulu and Ekele(2004) advised that Teachers and their students can produce materials and objects necessary for effective teaching and learning and this can be done by using locally available materials to deliver points on set objectives.

9. The Need for Improvisation of Instructional Materials in Agricultural Education

The improvisation of instructional materials has become necessary for effective teaching and learning in the developing countries and sub Sahara hence prevailing economic situation of the countries has its effects on the provision of educational facilities and instructional materials in our institution of learning. The present economic predicaments globally have resulted in a situation whereby instructional materials have become luxurious items in schools.

Agreeing with this, Mkpa (2003) puts it that, as a result of the present economic situation in the various countries government appears unable to provide schools with needed instructional materials. He noted that Parent Teachers Association (PTA)/ parents' forum of most institution cannot provide all the needed materials. It therefore, becomes imperative that teachers should help to ensure effective teaching and learning by improvising some important instructional materials. (From salaries that is much left to be desired). Improvisations of instructional materials enable both the teacher and his students to explore and exploit the resources of their environment for the purpose of effective teaching and learning. Some relevant materials needed for designing and production of instructional materials can be obtained by the teacher and his students during field trips to agricultural establishments. A teacher who enjoys teaching students and watching them learn, will enjoy creating an environment that helps them to learn. Improvisation of instructional materials promotes cooperative learning between the teacher and his students. This is necessary in creating conducive environment for teaching and learning in schools.

10. Recommendation

The following are some of the recommendations advanced for the teacher for effective use and improvisation of teaching aids;

- 1) Adequate instructional materials should be made available for teaching and learning of agricultural education. This

will make the lesson more simple and interesting to students.

- 2) Teacher and students should be sensitized through organizing workshops or seminars aimed at effective provision of instructional materials which is a priority and not a luxury in schools.
- 3) Government of various developing countries should make available information technology to all schools to be used in the teaching and learning of agricultural science education in schools
- 4) Teachers should improvise material for the teaching and learning in the classroom. In view of this, teachers should be encouraged and given incentives for making available instructional materials for use.

11. Conclusions

The availability and utilization of instructional materials, to a great extent, is necessary for enhancement of the teaching and learning of agricultural science. It means that instructional materials when available and is sufficiently used, will greatly improve the teaching and learning of agricultural education in our institutions of learning in developing countries. Teachers should make available materials from the environment and put them to use when teaching agricultural science lesson. This will, meaningfully improve the teaching and learning of both the teachers and learners of agricultural science education in the various schools, colleges and institutions teaching agricultural science as a subject and a course of learning.

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