Teaching of Agricultural Science at the Basic Education Level in Developing Countries: A Case Study of the Nature and Constraints at Cape Coast District of Ghana

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Abstract

Agricultural education is vital for economic development of most developing countries including Ghana. The central aim of the agricultural education at the basic level is to train students in the basic principles of agriculture, provide avenues for the development of their skills and change the attitudes of the young children towards agriculture. The study was undertaken using a descriptive survey design to assess teachers and head teachers' perceived constraints to effective teaching of agricultural science at the basic education level in Cape Coast District of Central Region of Ghana.

Pretested and validated questionnaires were used to collect the data from 54 randomly selected respondents constituting the sample size for the study.

The findings of the study revealed that the majority of the teachers were mature and experienced. Their major training in agriculture was at the training college level. Only a few have had in-service training in agriculture. Few teachers used supervised practicals at the school farms. Visits to nearby farms and seeking the assistance of resource people were never used. Constraints identified were related to technical aspects of agriculture, the syllabus, teaching materials, pre-service and in-service teacher training, teacher motivation, supervision, negative attitudes of students and parents towards agriculture, teaching environment, and evaluation. Action strategies to improve teaching of agriculture are provided.

Introduction

Agriculture is the mainstay of the economic growth and development of many developing countries including Ghana. There is, therefore, the urgent need to develop the indigenous people (agricultural professionals and farmers) with the critical necessary skills and knowledge in agriculture required to facilitate the crucial role agriculture plays in national development. Against this background, the various governments of Ghana have pursued agricultural-led policies in its educational system. Currently, formal agricultural education is offered at the University, Teacher Training College, Senior Secondary School and basic (primary school and Junior secondary School) educational levels under the jurisdiction of Ministry of Education. The five agricultural colleges under the Ministry of Food and Agriculture also provide agricultural education.

The central aim of the agricultural education at the basic level is to train students in the basic principles of agriculture, provide avenues for the development of their skills and change the attitudes of the young children towards agriculture (GES, 1987). Basic education in agriculture is vital because the future generation of farmers and agriculturists will need basic technical, managerial and entrepreneurial skills to compete in the expanding agricultural economy. To achieve the above objectives, the Ghana government has made considerable investment in curriculum development, teaching materials, and teacher training (preservice and in-service) so as to improve the teaching and learning conditions in schools. This is based on the public policy of education that seeks to provide equal and adequate educational opportunities in all fields and at all levels for all Ghanaians (Ghana Government Gazette, 1982).

Despite the tremendous efforts of Government to improve agricultural teaching, constraints still exist at the basic level (Obeng-Mensah 1992, and Riedmiller, 1996). All teaching methods have one common goal: to facilitate students' learning. The use of variety of techniques can provide the change of pace of teachers and students. It relieves daily routine and stimulates interest (FAO, 1990). The most popular and often used methods promote passive learning and discourage participation by pupils (Carasco et al., 1996).

Purpose

This paper presents the results of a study which assessed the nature and constraints to effective teaching of agriculture at the basic educational level. The results and suggested action strategies are important information and feedback of worthy consideration to educational policy makers, donor agencies, teachers and supervisors who intend to improve basic agricultural education, which is likely to be a terminal point for most students who are to take up farming, and related occupations for a living.

Methods and Data Sources

The study is a descriptive survey. The target population consisted of all teachers at the upper primary (primary 4 to 6), agricultural science teachers at junior secondary schools and head teachers in public schools in the Cape Coast district of Central Region, Ghana.

Data were collected from 54 randomly selected respondents using pre-tested and content validated questionnaires and focus group discussions. A panel of experts established the validity for the instrument. Inspection and observations were used to examine some classes and facilities for teaching agricultural science in the schools. Secondary data sources were sought from annual reports, books, journals; theses and dissertations related to agricultural education.

To identify the constraints to effective teaching of agricultural science at the basic educational level, focus group discussions were held with agricultural science teachers and their headteachers. Items listed were grouped under subheadings namely syllabus, technical areas of agriculture, teaching materials, pre-service training, in-service training, motivation, supervision, parents attitude, students attitude, evaluation and teaching environment were use to measure the constraints that affect the teaching of agriculture at the basic educational level. Later, eighty statements related to the subheadings were used to measure them. The perceptions of respondents about the statements were scored on a 5-point Likert type scale where 1 indicated "Major Constraint," 2 indicated " Constraint," 3 "Somehow Constraint," 4 "Minor Constraint," and 5 "Not a Constraint," The reliability for the subheadings was established using Cronbach's alpha test. The alpha ranged from 0.74 for technical areas, 0.68 for motivation constraints, 0.75 for syllabus constraints, 0.75 for pre-service and in-service training constraints, 0.75 teaching materials constraints, 0.76 for supervision constraints, 0.78 for parents and students' attitude constraints, 0.81 for teaching environment constraints, and 0.70 for evaluation constraints. The results of the subscales indicated that the questionnaires had an acceptable reliability.

Results

Background characteristics of respondents

The teacher is the pivot of classroom instructional activity. As Windham (1988) succinctly put it, the characteristics of teachers are an indicator of teaching quality and educational effectiveness. This study, therefore, sought to describe the characteristics of teachers. The study revealed that, the ratio of male to female teachers was 1:1. Certificate holders (68.5%) from training colleges constituted the majority of the respondents though few (7.4%) had degrees from the universities. The age of respondents ranged from 23 years to 55 years. More than half (53.7%) were 40years or lower. The average age was 38.6 years.

Almost all the respondents were professional teachers, indicating they had obtained formal training in educational methodologies to impart skills to pupils. The majority have had 15 years of teaching experience (83.3%) and practice agriculture in their home (72.2%). About two-thirds (57.4%) indicated that they had received training in agriculture at the training college level while only 3 had attended an agricultural in-service training program.

Nature of teaching agricultural science

Although there is no single teaching method that is best suited for teaching all subjects, a combination of methods based on the objectives of teaching are recommended to ensure learning by students. This objective of this study was to identify methods that are often used by teachers and reasons for using or not using others. The results presented in

Table 1 show that teachers often used a questions and answers technique (62.5%), reading of textbooks with students (47.5%), and writing of notes on the blackboard for students to copy (77.5%). Focus group discussions with some teachers revealed that teachers preferred these methods because they did not need extensive preparation before using these methods.

Few teachers (17.5%) often used supervised practicals at school gardens. This is due to the lack of land and commitment of teachers to establish school farms. Majority of teachers never used resource persons (87.5%), visits to nearby farms (62.0%) and exhibitions (77.5%) to teach agriculture. Apparently, these methods could be used to augment practicals in school gardens. Teachers complained of inadequate time allotted for teaching agriculture as the reason for not using them. Teachers also indicated that they sometimes use lecture methods (47.5%), posters and charts (60%), demonstrations (47.5%) and problem solving/discovery methods (55%) to teach agriculture.

Table 1:   *Percentage distribution of the extent to which some methods are used by Teachers in Teaching Agriculture*

Activities	Often	Sometimes	Never
Supervised practicals at School Farm/garden	17.5	45.0	37.5
Lecture method	42.5	47.5	10.0
Group Discussion	42.5	40.0	17.5
Demonstrations	45.0	47.5	7.5
Visit to nearby farm or Agric. Institution (Field Trips)	7.5	30.5	62.0
Questions and Answer technique	62.5	30.0	7.5
Use of Posters and Charts	15.0	60.0	25.0
Use of agricultural resource person(s)	----	12.5	87.5
Role playing of issues	30.0	40.0	30.0
Class exercises and homework	65.0	32.5	2.5
Reading of agric. textbooks with students	47.5	25.0	27.5
Writing of notes on the blackboard for children to copy	77.5	32.5	---
Projects	17.5	55.0	27.5
Exhibitions	10.0	12.5	77.5
Problem Solving/Discovery	25.0	47.0	27.5

Constraints to teaching of Agriculture

Composite ratings of constraints to teaching of agriculture are presented in Table 2. With the exception of teaching materials (S.d. < 1.0), the respondents varied greatly in their opinion ratings (S.d > 1.00). Teaching of technical aspects of agriculture (mean=2.81) is somehow a constraint. Teachers indicated that, sometimes they find it difficult to teach how to keep farm records, grow field crops, make compost, keep small farm animals and poultry.

The syllabus also posed a constraint (mean = 2.24) to teaching of agriculture. In most cases, the syllabus coverage did not match the time allotted on the timetable. Most of the subject matter in the syllabus did not reflect school condition and real life situation within the communities. Therefore, teachers are not able to adapt the syllabus to students learning experiences in certain situations.

Motivation of teachers (mean=3.18) served as a constraint. There were no monetary rewards other than salary for achievements in school agriculture. Sponsorship packages to improve competencies of teachers at conferences and training workshops were non-existent. Moreover, there was general lack of appreciation of work done by agricultural teachers and students by authorities.

The negative attitudes of parents constituted a constraint (mean=3.65). Agricultural science at this level of education was compulsory for all students. Parents could, therefore, not influence the choice of the subject. Parents, however, were not participating in the management of school agriculture.

Table 2:   Composite Means, Standard deviations ratings of constraints to teaching of agriculture.

Constraints	Mean	Sd
Teaching of technical aspects of agriculture	2.81	1.20
Syllabus	2.24	1.21
Motivation of teachers	3.18	1.72
Attitude of parents to agriculture	3.65	1.63
Attitude of students to agriculture	2.83	1.56
Supervision of teaching of agriculture	2.89	1.68
Teaching Environment	2.33	1.54
Teaching – learning facilities	1.61	0.92
Pre-service training in agriculture received by teachers	2.13	1.30
In-service training of teachers	2.35	1.20
Evaluation of student learning	3.01	1.38

Means were computed on a scale that ranged from 1 = "Major Constraint", 2 = Constraint", 3 = "Somehow Constraint", 4="Minor Constraint", and 5 = "Not a Constraint".

The attitude of students somehow constrained the teaching of agriculture (Mean, 2.83). The students have low regard for agricultural studies since weeding was used in punishing students. Students, therefore, see activities carried out in the farms as punishment.

Constraints related to supervision of teaching of agriculture somehow is a constraint (Mean, 2.89). This was attributed to the absence of agricultural science liaison officers to coordinate agricultural science activities in schools and inadequate visits paid by head teachers to agricultural classes.

The teachers also perceived the teaching environment as a constraint (Mean=2.33). The climate and soils around the school compound in the study area were unfavourable to support plant growth all year round. The large class sizes caused work overload and difficulty in class control. Distractions of classes due to noise around school compounds were other factors that affected the teaching environment.

Constraints to teaching–learning materials (Mean=1.61) were related to shortage of tools, and other equipment, lack of finance to provide the required materials and facilities, insufficient textbook for students and absence of school farms.

The training received by teachers was a constraint. The pre-service training at the teachers training colleges did not equip teachers with adequate theoretical knowledge and practical skills. In-service training on agriculture was not organised frequently. The few organised ones were not effective to meet the instructional needs of teachers. They were also timed wrongly.

Evaluation of agriculture lessons also constrained teaching of agricultural science. Evaluation of students was geared towards promotion to next class rather than emphasis on acquisition of cognitive, affective or psychomotor skills. Teachers also fail to evaluate the strengths and weaknesses of teaching methods so as to use the feedback to improve instruction.

Conclusions

1.   The study revealed that the teachers at the basic educational level were experienced in terms of number of years of teaching. This connotes exposure and acquisition of skills overtime from formal and informal learning opportunities. However, their formal education attainment in agriculture is minimal and few have been exposed to in-service training in agriculture. The mean age of 38.6 years is an indicator of high emotional maturity and experience.

2.   Teachers often use questions and answers technique, read from textbooks with students and copy notes on the blackboard for students to copy when teaching agriculture. Few teachers use supervised practicals in the school garden, which was non-existing in some schools. Teachers never use resource people and visits to nearby farms.

3.   Constraints to effective teaching of agriculture at the basic educational level center on the syllabus, teaching of technical areas of agriculture, teacher motivation, supervision, pre-service and in-service training of teachers, supervision and evaluation of students. Others include attitude of students and their parents, teaching facilities, and teaching environment.

Educational Importance/Implications

This study shows that the teachers at the basic level of education in the district are experienced and youthful. This is very good since the majority can undergo further training in agriculture and contribute their quota before the pension age.

Many of the traditional ways of teaching are no longer fully adequate unless correctly augmented by variety of student activities, feedback, and dialogue. Practical demonstrations are very important in teaching of agriculture. Therefore, schools offering agriculture must be equipped with agricultural laboratories with facilities such as tools shed, animals shed, and a school garden.

The results of the study point to the need for governments to motivate agricultural science teachers to exhibit high level of commitment and professional competency in teaching agriculture. Highly motivated teachers usually have their morale boosted and will collaborate to ensure that the goal of teaching children to acquire requisite knowledge and skills are achieved. Motivation could also be in the form of good remuneration, end of year bonuses, and logistic supply. Immediate supervisors can influence the motivation and performance of teachers through rewards and penalties ranging from praise, salary increase, and promotions.

There is also need for collaboration between the Ministries of Education and Food and Agriculture, the higher agricultural institutions such as universities, teachers, parents and private sector and communities to address constraints to effective teaching of agriculture at the basic level of education. The universities need to collaborate in curriculum design and supervision. They can also develop in-service training courses to upgrade the competencies of agricultural science teachers. The agricultural extension agents can also collaborate in the establishment and supervision of school farms with agricultural science teachers. They can also demonstrate important skills in agriculture to teachers and pupils.

Parents, private sector, communities and Non Governmental Organisations(NGOs) can supplement the efforts of governments in the provision of teaching facilities. Their presence on school committees as collaborators and problem solvers can ensure that what is taught in schools are the concerns of local people.

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