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Preparing the Urban Agricultural Science Teacher: Curriculum Implications

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ABSTRACT Available lands in urban and rural schools are increasingly being threatened by developmental factors that spaces previously given to schools are now being retrieved by donor communities. This has affected the production of food crops by schools especially in the urban areas. The effect is experienced in the high cost of food items in the urban area with very high population. Schools are expected to produce food for the teaming population through the leading of competent teachers of Agricultural Science. Therefore, effective knowledge of the land usage is imperative recognizing the composite nature – various areas of specialization in Agriculture. This paper examined the needed competencies by teachers of Agricultural Science in urban areas as to making for effective institutional preparation for teacher trainees. Result showed that teachers identified 24 competencies needed for urban teaching of agriculture but expressed deficiency in 19 competencies (79.17 percent). The curricular implication of this range from inclusion of the basic Humanities subjects of Geography, Economics and Commerce in the curriculum of Agricultural Science teachers programme and effective implementation of field trips to strengthen the relationship between theory in the school and practice in the field.

INTRODUCTION

Land is a major factor in the practice of Agriculture, and Nigeria is a country blessed/ endowed with good expanse of fertile area suitable for tree, arable crop production and rearing of animals. The in-land waters –streams, lakes and rivers are of fresh water while the coastal areas are brackish; thus providing favourable environment for cultivation and harvesting of useful aquatic animals such as fishes and shrimps.

Urbanization is occurring at a very fast rate resulting from the exploration of oil and migrant activities from the rural areas to the cities; thus reducing the farming population that hitherto resided in the rural villages. This has implied high cost of food items and making importation to be adopted as interim check measure.

The available land for Agricultural farming in the urban areas and schools in particular is currently being taken over or threatened by other activities of man such as housing estates, hospitals, markets, industries, government establishment and roads. School land areas have been retrieved by communities that offered them at the initial stage of establishment. All these have affected school food production negating some of the reasons for Agricultural Science in School (FRN 2004) especially practiced activities for students in the urban areas as vocational Agricultural education is the emphasis of the Educational Policy (NPE 2004). The youth in school are expected to take the farming after leaving school to produce more food for the increasing population and replace the aged peasant farmers that are currently practicing agriculture on small holder basis (Egun 2003).

The practice of Agriculture (Farming) is usually seen or concepted as a rural activity, but Egun (2009) has observed that majority of Nigerian youths will return to the land in the near future as the white-collar jobs in the urban cities have failed to absorb the youths leaving school. There is the need to prepare the youth for occupations in Agriculture both for urban and rural living. This has import for the teacher and his preparation for teaching.

The Problem

Changes in the society necessitate that teacher's preparation programmes need to adopt new strategies to meet higher standards for teaching and learning. Institutions that prepare teachers must also restructure to keep in step with the reform movements. The traditional role of the schools/teachers is the preparation of the young people for adult life, citizenship and employment. In a rapidly changing society with increasing choices and dilemmas, profound and fundamental change in social relationships and increasing uncertainty arising from rural urban

migration and development of cities with high population and land hunger; the traditional content and mode of teacher preparation need to be re-examined. Specifically, no teacher is prepared for the urban area. However, the content of teacher preparation in Agriculture enables him/her to adjust teaching to varying conditions, situations/environment. The teacher preparation is the focus of this work since what he has, he imparts to learners in school. Teacher schools have been sharply criticized for preparations not accomplishing the goals of teacher education. The curricular are often too theoretical and do not provide students with adequate reality experiences.

Currently, at the graduate level, two approaches are employed in producing/ preparing Agricultural Science teachers (Egun 1999). The regular programme of admitting first time or beginning (pre-service) teachers and the sandwich programme in which already employed teachers are provided an upgrading opportunity. In all, both programmes have the same course offering, are handled by same lecturers and are geared towards the development of effective competencies needed by agricultural science teachers. The Competency Based Teacher Education (CBTE) was a response by Vocational Education to taxonomy of educational objectives (Blooms 1980).

The idea of competence is not new but was only acknowledged as an explicit goal of our educational system in the 1980s, following concern that a gap existed which was affecting the economic "well-being" of the country. The aim was to bring major occupations, including teaching into this framework and become a major issue in the field of initial teacher training, especially in the vocational subjects such as Agriculture with much greater emphasis on school based work.

Three models attempts to give explanation to competency based teacher education. The first model views competence as a combination of discrete parts. Its roots lie in the work of Glaser (1965) and Gagne (1965) in their initial attempt to develop criterion-referred-based programmes that relied upon task analysis to draw up list of task components. Tyler (1949) gave leaning to this when he stated that the clearest way of defining objectives and using them for assessment was to make them statements of desired behaviour.

The second model appears to reflect a wider approach to competence as the centres of cognisance. Cognisance is of more importance than the learners' ability to replicate learned behaviour within a learned context. It is the behaviour displayed with a performance, not the knowledge and understanding required which is the principal focus of attention. The aims are to outline activities characteristic of an occupational area. Advocates of this model include Stanton (1989), Mansfield (1990).

However, there is the need for ways of producing high quality standards which capture both the key performance and the combinations of attributes, which underpin these key performances. This is the third model commonly referred to as the integral or holistic competency approach. Functional analysis is used as a general method, but it stressed that additional input which affect performance, such as knowledge and understanding which a person applies in specific instances (Black and Wolf 1990). Thus a performance is the combination, not the mere presence of the contributing tasks. Competence in this view depends upon knowledge, understanding, experience and executive ability. As a crucial distinction, it highlights factors such as intention, judgement; decision making disposition and habits of mind. This model has been used successfully in a variety of occupations (Gonezi et al. 1990; Ash et al 1992; Hager and Gonezi 1993; Hager 1994; Egun 2002).

The objective of this study is to determine the areas of needed competencies in the teaching of Agricultural Science in the urban areas and assess the level of possession of these competencies by current teachers of Agricultural Science. One hypothesis of no significant difference between the levels of competency possession by teachers and the competencies needed for the urban teaching of agricultural science guided the study.

The method adopted in identifying the competencies needed by teachers for effective job performances is the Educational Need Assessment (ENA). This was what Agwubike (1984) recognised when he stated that every pre-service and in-service programme planned for teachers should be based upon some type of needs assessment; which can take two forms:

1. That planners may base the needs assessment upon their perceptions of staff deficiencies; or
2. A need assessment survey is sent to the teachers once in a while in an attempt to assess their felt professional needs.

This agrees with Samborn and Ecoring (2007) when they averred that to be successful in today's' world of work, the individual needs practical skills, many of which can only be learned through hand-on-work based on situational changes in the society and back to school programmes.

The need assessment survey has long been acknowledged as a better way of assessing the level of competency possession of a worker (Olaitan 1982; Anyakoha 1985; Agwubike 1984; Hager 1994; Egun 2002). The need assessment survey method provide opportunity for respondents to assess themselves under a free atmosphere of self confidence and trust (Gonzale 1982)

The results procured from this need assessment can be used to determine the shape and scope of pre-service and in-service programme for teachers of Agriculture both for rural and urban habitation and practice.

MATERIAL AND METHOD

This is a descriptive research employing the survey design. The survey is employed because it involves collecting data as they are in the field; as they are perceived by the respondents without subjecting them to any manipulation.

The geographical area of study was Delta State with all categories of teachers of Agricultural Science in urban secondary schools. Urban is defined a town that are supplied with electricity, pipe borne water, police station and with a population of 10, 000 persons and above. Consequently, Warri, Agbor, Ughelli, Asaba, Sapele (National Population Commission, NPC 2006) were selected. Thus, the population of Agricultural Science Teachers was 530 comprising 330 males and 200 females.

Sample of Study

50 percent of each sex of the population was purposively selected as sample population. Thus, sample size was 165 males ad 100 females.

The instrument for collecting data was the inventory questionnaire with items of identified competencies considered necessary for effective teaching in urban schools. Essentially, the instrument is an amalgam of instruments used by Mama (1994), Tibi (1997), Egun (2002), Egun (2008). It was of two sections of A and B.

Section A consists of demographic date characteristics, while Section B consisted of items which the respondents were to indicate level of possession and preferred level of possession. Each column was scaled 5, 4, 3, 2, and 1 corresponding to High, Above Average, Average, Below Average and Low, respectively. Respondents were requested to indicate the extent to which they can perform the tasks and the level they would prefer to perform respectively in the field.

Instrument validation was achieved by the use of experts in Agricultural Education, test and measurement and English language. They assessed the items against the questionnaire objectives on the basis of relevance, clarity and capability of eliciting the desired response.

The reliability of the instrument was determined by a test-retest exercise using Pearson product moment correlation coefficient. Twenty teachers were randomly selected from one of the urban towns and issued two copies of the validated instrument at intervals of three weeks. Correlation coefficient of 0.86 was obtained. Internal consistency was measured with Cronbach alpha.

Five hundred and thirty teachers were issued the questionnaire with a return of five hundred and twenty-five questionnaires. Data was analysed using mean, for the research questions and T-test for the hypothesis which states that:

1. There is no significant difference between the level of possession of competencies possessed by the teachers and competencies needed for teaching Agricultural Science in urban areas.
2. No significant difference between levels of possession of males and females in competencies rating of the needed competencies.

Ordinal values were assigned to different rating statements as follows: High 5; Above Average 4; Average 3; Below Average 2; and Low 1. The mean of 3 was set as cut-off point. Mean of 3 was accepted as adequate and any score below 3 was accepted as requiring improvement. All tests were carried out at 0.05 level of significance.

RESULTS AND DISCUSSION

Results of instrument validation showed that teachers of Agricultural Science identified 24 competencies needed for the teaching of agricultural science in urban schools. These competen-

cies had a mean score of 3 and above (Table 1). By this, teachers of agricultural science in the urban areas are required to possess and develop the competencies to effectively teach agricultural science in the urban areas.

Table 1: Mean of respondents rating on perceived importance of competencies needed in urban agricultural science teaching.

S. No.	*Competencies*	*Mean*	*Remark*
1	Land management	4.27	High
2	Pre-planting operation	4.02	High
3	Maintenance operation	4.38	High
4	Processing operation	4.06	High
5	Disease and pest control	4.45	High
6	Marketing of crops	4.32	High
7	Selection of animals	4.15	High
8	Feeding and managing young animals	4.03	High
9	Managing adult animals	4.12	High
10	Marketing of animals and their products	4.21	High
11	Control of diseases and parasites	3.21	High
12	Oral expression	4.50	High
13	Written expression	3.42	High
14	Friendliness	4.02	High
15	Leadership	4.50	High
16	Collective will to work	4.25	High
17	Willingness to learn	3.32	High
18	Construction of pond	4.30	High
19	Stocking of pond with fingerlings	4.42	High
20	Feeding of fish	4.42	High
21	Bailing of fish pond	4.25	High
22	Harvesting of fish	4.10	High
23	Grading of fish	4.20	High
24	Sale of fish	4.51	High

Analysed data showed that teachers of Agricultural Science in the urban areas are effectively able to perform 5 (items 12, 13, 14, 16 and 17) of the 24 competencies identified for effective teaching of Agricultural Science in urban areas. This gives 20.83 percent of the identified competency needed in the teaching of productive Agricultural Science (Vocational Agriculture) in Secondary Schools in the urban areas (Table 2). The deficiencies were expressed in the high total grand mean of needed level of possession. The low level of possession of needed competencies could be a contributory factor in the high prices and shortage of some food items such as tomato, fresh vegetables – amaranths, lettuce and cabbage; and some animal products such as fish, poultry products and pork.

On comparative competency possession of male and female teachers of agricultural science, there exist no significant difference (Cal. $t = 0.90 < 1.96$ @ 0.05) in perceived level of possession. This agrees with the findings of Wiseman et al. (1995); Obodo (1996); Egun (2002). Their studies concluded that sex plays no significant role in performance in Science and Technology (Table 3).

Table 2: Mean of respondents rating on level of competency possession and preferred level of possession.

S. No.	*Competencies*	*Level of possession*	*Preferred level of possession*
1	Land management	1.7595	4.2911
2	Pre-planting operation	1.7532	4.2098
3	Maintenance operation	2.8155	4.4051
4	Processing operation	2.7278	4.2975
5	Disease and pest control	2.8981	4.3994
6	Marketing of crops	2.9747	4.4114
7	Selection of animals	1.9494	4.3611
8	Feeding and managing young animals	1.8861	4.3861
9	Managing adult animals	2.9177	4.1519
10	Marketing of animals and their products	2.9304	4.2595
11	Control of diseases and parasites	2.9304	4.2595
12	Oral expression	3.8291	4.2405
13	Written expression	3.0506	4.2468
14	Friendliness	3.9873	4.1646
15	Leadership	2.0127	4.2348
16	Collective will to work	3.9489	4.3611
17	Willingness to learn	3.9408	4.3611
18	Construction of pond	1.0618	4.1116
19	Stocking of pond with fingerlings	2.9810	4.0192
20	Feeding of fish	2.9873	4.0570
21	Bailing of fish pond	1.9684	4.0886
22	Harvesting of fish	1.9747	4.0823
23	Grading of fish	2.9937	4.0443
24	Sale of fish	2.8608	4.2041

The teachers expressed general need for a higher level of competency possession in all the needed competencies for urban teaching of agricultural science. However, higher needs were expressed in items 1, 2, 7, 8, 18, 21 and 22 (Table 2). Item 1 and 2 centres on land management. Lands for agricultural practices are reducing everyday as a result of pressure from other activities of man such as that for hospitals, clinics, housing, industries, parks, markets and even roads. Therefore, it becomes necessary that teachers of agricultural science be prepared for effective use and management of land. By implication, a good knowledge of geography becomes imperative and should be included in the curriculum of teacher education in Agriculture.

Item 7 and 8 dealt with the selection and management of young animals. Effective competency in this area will minimize loss in rearing,

Table 3: Comparative mean rating scores according to sex on identified competencies

S. No.	*Competencies*	*Male*	*Female*
1	Land management	2.8539	2.6377
2	Pre-planting operation	2.7978	2.6957
3	Maintenance operation	2.9663	2.6232
4	Processing operation	2.6742	2.7971
5	Disease and pest control	3.0225	2.7681
6	Marketing of crops	2.9775	2.9710
7	Selection of animals	3.0449	2.8261
8	Feeding and managing young animals	3.1011	2.8612
9	Managing adult animals	3.0112	2.7246
10	Marketing of animals and their products	2.9775	2.8696
11	Control of diseases and parasites	3.1236	2.6812
12	Oral expression	2.7191	2.7826
13	Written expression	2.8652	2.8621
14	Friendliness	2.9213	2.7101
15	Leadership	3.1461	2.9275
16	Collective will to work	3.0562	2.8986
17	Willingness to learn	3.0449	2.6710
18	Construction of pond	3.0227	3.0000
19	Stocking of pond with fingerlings	3.0225	2.8824
20	Feeding of fish	2.8876	2.8986
21	Bailing of fish pond	2.9101	2.9275
22	Harvesting of fish	3.0000	2.9710
23	Grading of fish	2.8989	2.8116
24	Sale of fish	2.9101	3.0145

most especially brooding as applied to poultry keeping. Nutrition is a very important aspect of animal keeping. Item 7 recorded a low level of possession and should therefore form part of the content of retraining. Ability to select healthy animals with desirable qualities has been identified as a needed competency as good level of the ability in the act remains a stepping stone in the survival of animals under keep and rearing especially in captivity management system which the urban environmental laws allows or permits

Item 18 deals with pond construction. Respondents rated it 4.30, signifying high level of importance, but expressed level of possession as 1.0618 and needed level of possession as 4.1116. This no doubt affects land utilization where available. Available school land area that cannot be used for crop production or building of pen for animals can conveniently be utilized in fish production through the construction of ponds. Maintenance of fish ponds should be part of the curriculum in livestock production.

CURRICULAR IMPLICATION

The basic aim of Agricultural Education is to increase food production and raw material for the growing agro-based industries. Teachers are expected to provide the drive in achieving this goal through effective teaching that will lead to acquisition of productive skills by learners in school. The package (curriculum) of teacher education should therefore include courses in the areas that they have been found deficient. Teacher programmes in Agriculture, while retaining the basic sciences should include the humanities of Geography and the Social Sciences of Economics and Commerce.

Field trips to skill acquisition centres of Agricultural concerns should form a fundamental part of the curriculum. In addition, Teacher training institutions should develop micro units of skill training centres. This no doubt will assist in providing practicing areas rather than teachers being produced on pseudo-job orientation or on the basis of simulation.

Teacher training institutions should be staffed with quality instructor in keeping with the basic training theory of Vocational Education which states that quality in Vocational Education will be as effective as the instructors have been properly trained to effect instruction.

CONCLUSION

Teachers generally accepted being able to perform 5 (25%) out of the 24 competencies needed for the effective teaching of Agricultural Science in urban schools. However, the level of performance was marginal as needed level of possession showed a deficiency in all the competencies needed for school urban agriculture (Table 2). The remaining 19 (79.17%) competencies needed improvement hence should form the part of pre-service training of teachers and core or central area component of in-service, workshop, and seminar training for serving teachers.

Gender (sex) was no barrier in the possession of competencies that was rated (Table 2). Therefore, equal opportunities should be provided for the retraining of both male and female teachers of Agricultural Science. This confirms the work of scholars as Obodo (1996), Ngoka (1997), Egun (2002), that in Science and Technology, there is no significant difference in performance based on sex.

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