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SUSTAINABLE DEVELOPMENT, FORMAL EDUCATION AND SKILLS ACQUSITION: THE CASE OF AGRICULTURAL SCIENCE IN KADUNA METROPOLIS

A. A. Ammani[1] and A. A. Ogunyinka[2]

1. National Agricultural Extension and Research Liaison Services, Ahmadu Bello University, Zaria, Nigeria
2. Department of Education (Tech), Kaduna Polytechnic, Kaduna.

ABSTRACT

Education has always been a prerequisite for all forms of effective development. One of the main objectives of the Nigerian National Policy on Education is to make secondary school leavers "immediately employable". This objective was based on two assumptions: (i) that the major reason why most secondary school leavers are unemployed is that they have no vocational skills (ii) that the senior secondary school can teach the necessary skills, thereby ensuring mass employment of school leavers. Thus, the insertion of certain vocational subjects, such as agricultural science, in secondary schools programmes. This study set out to answer the question: can Nigerian secondary schools, as they exist, teach the necessary vocational skills required to make school leavers "immediately employable"? The answer is attempted based on the circumstances of agricultural science as a vocational subject taught in senior secondary schools in Kaduna Metropolis. All ninety-one agricultural science teachers were sampled from the twenty four schools randomly selected within the study area. Data was collected using a semi-structured questionnaire, and analysed. Findings indicates shortage of qualified teachers and inadequate availability of teaching resources, materials, equipment and tools in schools for the effective teaching of agricultural science as a vocational subject. It was concluded that Nigerian secondary schools as they exist cannot teach the necessary skills required to enable school leavers be "immediately employable". Implications of the findings were discussed and recommendations advanced to enhance the effectiveness of teaching agricultural science as a vocational subject in senior secondary schools.

Keywords: formal education, vocational skills, Nigeria.

INTRODUCTION

The concept of sustainable development has become a global medium for expressing the need to depart from hitherto dominant models of development that apparently fail to balance the needs of people and the planet in the pursuit of peace and prosperity (Wals, 2009). There is no one-size-fits-all definition of sustainable development. According to Kates et al (2005), even the Brundtland Commission's brief definition of sustainable development, which is surely the standard definition when judged by its widespread use and frequency of citation, is creatively ambiguous: "Humanity has the ability to make development sustainable—to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs." However, as Wals (2009) observed, the fact that there is no 'one size fits all' definition of sustainable development, does not necessarily make sustainable development a weak concept, on the

contrary, it can be argued that this characteristic allows for the key challenge of our time to be addressed in multiple ways from different vantage points in locally grounded but globally connected ways.

Education has always been a prerequisite for all forms of effective development. All societies, primitive or modern, require education to enable new members not only to fit into their work roles in the world of work but also to satisfy the labour needs of the economy (Dewey, 1959). Thus, every society look up to the school and the curriculum as necessary for enabling the rising generation gain the needed insight, skill and power to build a better society.

In fact, Chapter 36 of Agenda 21, the landmark publication that resulted from the United Nations Conference on Environment and Development (UNCED), also known as the Earth Summit, held in Rio de Janeiro in 1992, which documents a comprehensive plan of action to be taken globally, nationally and locally to reduce the human impact on the environment, identifies four all-encompassing goals, the first of which is to promote and improve the quality of education**.** The aim is to refocus lifelong education on the acquisition of knowledge, skills and values needed by citizens to improve their quality of life (Wals, 2009).

In Nigeria, education is recognised as an instrument "par excellence" for affecting national development (FGN, 1998). The National Policy on Education (FGN, 1998) set the main objective for secondary level vocational and technical education to make secondary school leavers "immediately employable". This objective was based on two assumptions: (i) that the major reason why most secondary school leavers are unemployed is that they have no vocational skills (ii) that the senior secondary school can teach the necessary skills, thereby ensuring mass employment of school leavers (FGN, 1981). Thus, the insertion of certain vocational subjects in secondary schools programme, to train students in the basic skills required to serve as productive workers in their respective subject areas, in such a way that school leavers will become useful to themselves and the community (FGN, 1981). One of such vocational subjects is Agricultural Science. According to Akinsanmi (1988), the introduction of Agricultural Science as a vocational subject in senior secondary schools is to give students an all-round theoretical and practical education which will equip them to face the challenges and opportunities which are inherent in farming as a business.

However, since the inception of the policy, some major constraints to its effective implementation have been identified to include: dearth of qualified teachers (Sesay, 1989 and Towe, 1998); lack of adequate teaching materials, equipment and tools (Agbarevo, 1998; Aina, 1986; Olaitan & Ajala, 1987; and Olaitan, 1991a). Consequently, agricultural education programmes in our secondary schools have remained essentially devoid of practical based skills in agricultural production (Anaso & Anene, 1984; Eze, 1997 and Ogbazi, 1985). The implication of the foregoing is that schools are graduating students with inadequate job skills in agricultural production and self-employment. This portends a bleak future for the attainment of the lofty goals of the National Policy on Education of making secondary school leavers "immediately employable".

The question that arises for this study is: can Nigerian secondary schools, as they exist, teach the necessary vocational skills required to make school leavers "immediately employable"? The answer to this question is attempted based on the circumstances of agricultural science as a vocational subject taught in senior secondary schools in Kaduna Metropolis. Specifically, the study aimed at:

(i) Evaluating the availability of qualified teachers for the effective implementation of the senior secondary agricultural science curriculum.
(ii) Assessing the availability of teaching resources, materials and equipment for the effective implementation of the senior secondary agricultural science curriculum.
(iii) Identifying the problems that militate against the effective teaching of agricultural science as a vocational subject in senior secondary schools.

The importance of agriculture in Nigeria's development cannot be over emphasized. More than 70% of Nigeria's population are still living in rural areas where their livelihood depends on agriculture. Thus, Nigeria is still an agrarian country. Effective Agricultural education is expected to impact on future farmers' adoption of innovation in three ways: (i) improving the individual's judgment in the choice of optimal combination of inputs (ii) improving the individual's ability to obtain access to information pertinent to the choice of the optimal combination (iii) improving the individual's ability to adopt agricultural production practices that are environmentally friendly, particularly as it affects the use of agrochemicals: fertilizers, pesticides and herbicides. This study became imperative as it set out to evaluate the effectiveness of teaching agricultural science as a vocational subject in senior secondary schools. Its findings are also expected to contribute to knowledge vis-à-vis the status of Agricultural science as taught in our secondary schools: is it really taught as a vocational subject? It is also hoped that policy makers and education administrators will see in the findings of this study very useful guidance for improving the effectiveness of teaching agricultural science in secondary schools. Taking together, the study hope to contribute, modestly, towards the attainment of the lofty goals of both the National Policy on Education of making secondary school leavers "immediately employable"; as well as that of Agenda 21 of refocussing education on the acquisition of knowledge, skills and values needed by citizens to improve their quality of life

METHODOLOGY

The study was conducted in Kaduna metropolis comprising of Kaduna North and Kaduna South local government areas (LGAs), and parts of Igabi and Chukun LGAs. A multi-stage sampling technique was adopted for the study. First, the study area was purposively selected due to the proliferation of secondary schools and its proximity to the researchers. Second, 24 secondary schools were randomly selected from a list of 119 secondary schools in the study area obtained from the State Ministry of Education. Third, all 91 teachers of agricultural science in the 24 selected secondary schools formed the study sample. Primary data was collected using a semi-structured questionnaire. The questionnaire was structured on a four-point Likert response scale as expounded by Nworgu (1991). Data collected to achieve objectives (i) and (iii) were analysed using percentage and means.The procedure adopted for the analysis of the data collected to achieve objective (ii) was to tally the response to each single item on the questionnaire according to the mode of response: Adequately available was scored 4, Moderately available 3, Inadequate 2, and Unavailable at all 1. The score of response for each item and its weighted mean were determined and tabulated. A cut-off point of 2.50 was calculated. Any item with a mean below the cut-off point is considered inadequately available.

Results and Discussions

Table 1 shows the characteristic features of agricultural science teachers at the senior secondary level in the 24 schools covered by this study. It shows that Professional Graduate teachers (graduates with a teaching qualification) account for

34.94% of teachers teaching agricultural science in the schools. Professional non-graduate teachers, the NCE holders, constitute 13.25%. Other agricultural science teachers that are not trained in agriculture yet are teahing agricultural science are 4.82%. The table also indicates that the average working experience of agricultural science teachers in the schools covered is 17.4 years for the professional graduates. This finding is consistent with that of Sesay (1989) and Towe (1998), that there is generally a shortage of qualified teachers for vocational and technical education. The finding also agrees with that of Olaitan (1991a) that more than 50% of teachers teaching agricultural science in senior secondary schools are not qualified.

Table 1: Characteristic Features of Teachers of Agricultural Science at the Senior secondary School Level.

Group	No of Respondents	Percent	Average Working Experience (Years)
Professional Graduates	29	34.94	17.4
Non-Professional Graduates	39	46.99	9.8
Professional Non-graduates	11	13.25	7.3
Others	4	4.82	10.
Total	83		

Table 2 shows the response of Agricultural Science teachers on the extent of availability of tools, equipment and teaching materials necessary for the effective implementation of the Agricultural science curriculum at the senior secondary level. Its analysis revealed that none of the 24 schools covered in this study have adequate availability of any of the 9 major groups of items containing all the required tools, equipment and teaching materials necessary for the effective implementation of the curriculum. The table indicates that only 4 out of the 9 groups of items had a mean frequency of response on availability above the cut-off point of 2.50. These items are: the availability of school farms, laboratory/laboratory materials and equipment, farm tools and equipment and the availability of graphic teaching aids. The table also shows that livestock and fishery equipment; and elementary survey equipment are inadequately available for the implementation of the agricultural science senior secondary curriculum. Furhtermore, farm animals and fishponds are conclusively unavailable at all, in the 24 schools covered by this study. This finding is consistent with that of Adeife (1993) and Towe (1998) that the major problem confronting vocational and technical education programme in Nigeria is that of providing adequate facilities, equipment and tools. This finding also agree with those of Agbarevo (1998), Olaitan & Ajala (1987) and Olaitan (1991a) that the provision of adequate resources for teaching and learning agriculture in secondary schools constituted and remain a serious problem. This finding further lend credence to Anaso & Anene (1984), Eze (1997) and Ogbazi (1985) that school training in agriculture is primarily limited to classroom instructions, overloading students with masses of factual information with little or no “hard-on” experience in agricultural practices mainly because the schools lack facilities for practical work. According to Okorie (1993), lack of adequate teaching materials and equipment resulted in schools graduating pupils with poor quality, devoid of enough vocational and job skills as well as ability to solve practical problems.

Table 2: Availability of Tools, Equipment and Teaching Materials necessary for the Implementation of the Senior Secondary Agricultural Science Curriculum

Item No	Item	%	Mean Response	Decision
1.	School Farm	60.0	2.59	M
2.	At least one of the following: Pigs/Rabbit/Poultry	10.0	1.34	UA
3.	At least one of the following: Goat/Sheep/Cattle	0.00	1.03	UA
4.	Fish Pond	10.0	1.07	UA
5.	Laboratory/laboratory materials and Equipment: such as soil and rock samples, pH meter etc.	56.67	2.66	M
6.	Farm tools and equipment: hoes, cutlasses, rakes, spades, trowels, secateurs, shears etc.	66.67	3.00	M
7.	Livestock and fishery equipment: waterers, feeders, hook & line, egge candlers etc.	33.33	2.00	I
8.	Elementary survey equipment: measuring tapes, pegs, ranging poles, theodolite etc.	43.33	2.39	I
9.	Graphic teaching aids (teacher-made or bought): pictures, diagrams, charts etc.	56.67	2.71	M

Table 3 shows the problems militating against the effective teaching of agricultural science as viewed by the teachers of the subject in the 24 schools covered in this study. The table indicates that 83.33% of the respondents considered lack of teaching materials, tools and equipment to be a major problem. Careless attitude to field practical by schools' management and the poor attitude of the students towards the subject are identified as problems by 56.67% and 50.00% of the respondents respectively. This finding agree with that of Adeife (1993), Agbarevo (1998), Olaitan (1991a), Olaitan & Ajala (1987), and Towe (1998) that the major problem confronting vocational and technical education in Nigeria is that of providing adequate teaching materials and equipment. The finding that 56.67% of the respondents considered schools'management disregard to practicals is consistent with that of Olaitan & Ajala (1987) that schools' authorities emphasise mere academic skills to the detriment of practical work. Only 13.33% of the respondents agree with Olaitan (1991b) that academic content of our agricultural education curriculum is disproportionately large which tend to educate students as job seekers instead of job makers. For probably the first time, the security of school farms against thieves is considered a problem militating against effective teaching of agriculture as a vocational subject in senior secondary school. This is the view of 43.33% of the respondents.

Table 3: Problems Militating against the Effective Teaching of Agricultural Science as a Vocational subject in Senior secondary schools.

S/No	Problems	Respondents (%)
1.	Lack of teaching materials/ equipment	83.33
2.	Dis-regard to practicals on schools curriculum	56.67
3.	Students' poor attitude to the subject	50.00
4.	Security of farm against thieves	43.33
5.	Lack of qualified teachers.	40.00
6.	Teachers' motivation	33.33
7.	Poor funding	30.00
8.	Not going on excursion	23.33
9.	In-adequacy of textbooks	16.67
10	Public negative attitude to the subject	16.67
11	Course content is bulky	13.33
12	Non cooperation of schools' management	6.67
13	Teachers' attitude	6.67
14	Congestion of students in classrooms	6.67
15	Non functioning of the Young farmers Club	6.67

CONCLUSION AND RECOMMENDATIONS

The study set out to answer the question: can Nigerian secondary schools, as they exist, teach the necessary vocational skills required to make school leavers "immediately employable"? The answer is attempted based on the circumstances of agricultural science as a vocational subject taught in senior secondary schools in Kaduna Metropolis. Ninety-one agricultural science teachers were sampled from the twenty four schools randomly selected within the study area. Data was collected using a semi-structured questionnaire, and analysed. The high point of the findings and conclusions that emerge from the study are as follows:

(i) There is a shortage of qualified teachers for the effective teaching of agricultural science as a vocational subject in senior secondary schools.

(ii) There is inadequate availability of teaching resources, materials, equipment and tools in schools for the effective teaching of agricultural science as a vocational subject.

(iii) The major problems militating against the effective teaching of agricultural science as a vocational subject in schools include inadeqaute provision of teaching equipment and materials, less emphasis on the conduct of practicals by both the curriculum and the schools' management; and students' negative attitude to the subject.

Based on the foregoing findings, it is concluded that Nigerian secondary schools as they exist cannot teach the necessary skills required to enable school leavers be "immediately employable".

IMPLICATIONS OF THE FINDINGS

The results and findings of this study have the following implications for the effective implementation of the senior secondary agricultural science curriculum, which will enable Nigeria derive the benefits envisaged by the lofty goals of the National Policy on Education, that:

(a) Additional fund will have to be allocated to agriculture teacher education programme to vigorously pursue the production of adequately trained manpower for the eventual training of the trainers of students that would function effectively towards the attainment of the lofty goals of the National Policy on Education.

(b) Government, both federal and states, and private proprietors of schools should step up efforts to provide agricultural education materials and equipment in senior secondary schools to enable the trained teachers deliver the goods after their training. In other words, schools would have to be equipped with the minimum of laboratories, equipment, and schools' farms etc which need to be used for the effective teaching of agriculture as a vocational subject.

(c) There is also a need to re-appraise the curriculum offerings of agriculture education under the 6-3-3-4 system in senior secondary schools in line with Olaitan (1991a), that the curriculum should aim at the development of knowledge and skills in specific occupation areas of agriculture rather than trying to be everything at the same time.

(d) Appropriate textbooks that are relevant and adequate to the curriculum should be developed and made available with the assistance of reputable educational publishers.

RECOMMENDATIONS

In view of the findings of this study, the following recommendations are advanced to enhance the effectiveness of teaching agricultural science as a vocational subject in senior secondary schools:

1. Agricultural education programmes in secondary schools should be provided with the wherewithal and adminisrative support needed, with guest lectures, field trips, visits to agricultural establishments, film shows, agricultural shows, exhibitions etc. Some of these activities were recommended in the National Curriculum (FME, 1985). This is aimed at situmilating and sustaining students' interest in Agriculture.
2. Value reorientation is needed for a favourable attitude towards farming. Students' attitude to farming is a reflection of societal values. The need still exists for concerted public enlightment efforts on the importance of vocational education in all spheres of Nigerian life as advocated by Akale (1987).
3. The name of the subject as offered in the senior secondary school should be changed from Agricultural Science to Vocational Agriculture. This is because referring to the subject as "science" is a misnomer as it de-emphasises the vocational intent of the subject and reduces it to the level of the pure science subjects in approach, content, arrangement and methodology.

REFERENCE

Adeife, T. O. (1993). Developing Curriculum in Technical Education. In Ivowi, U. M. O. (ed) Curriculum Development in Nigeria. Ibadan: Sam Bookman.

Agbarevo, M. N. (1998). Towards an Effective Students Participation in Practical Agriculture in Secondary Schools. Technical Education Today. 8 (1&2): 16-20.

Akale, M. A. G. (1989). Towards a Competency Based Technical and Vocational Education for Technological Development in Nigeria. Paper presented at the 8th Annual Conference of the Nigerian Association of Educational Administration and Planning held in Kaduna.

Akinsanmi, A. O. (1988). Senior Secondary Agricultural Science. Logman: Essex.

Anaso, A. B. and Anene, C. (1984). A Guide to Teachers of Crop Protection in Colleges of Agriculture in Nigeria. Zaria: DAC/ABU.

Dewey, J. (1959). Experience and Education. New York: Macmillan.

Eze, T. (1990). Policy Constraints to the Growth of Technology Education Programmes: Implications for Technology Development in Nigeria. Journal of Technical Education Review 2 (2)

FGN (1981). National Policy on Education (Revised 1981). Lagos: Federal Ministry of Information.

FGN (1998). National Policy on Education (Revised 1998). Abuja: Federal Ministry of Information.

FME (1985). National Curriculum for Senior Secondary Schools. Lagos: Federal Ministry of Education.

Kates, R. W., Parris, T. M. and Leiserowitz, A. A. (2005). What is Sustainable Development? Goals, Indicators, Values, and Practice. Environment: Science and Policy for Sustainable Development 47 (3) : 8–21.

Nworgu, B. G. (1991). Educational Research: Basic Issues and Methodology. Ibadan: Wisdom Publishers.

Ogbazi, J. N. (1985). The Role of Cooperative Education in the Preparation of the Nigerian Youth for Employment in Agricultural Occupation. In Ehiametalor, E. T. (ed) Trends in Vocational Education in Nigeria. Benin City: Nigerian Education Research Association.

Okorie, J. U. (1993). An Overview of the Development of Vocational and Technical Education in Nigeria. In Anyakoha, E. U. & Osuala, E. C. (eds) Vocational Education and Self-Reliance. Nsukka: NVA Publishers.

Olaitan, S. O. (1991a). Technical and Vocational Education in Nigerian Schools. National School Curriculum Review Conference Proceedings. Lagos: Federal Ministry of Education.

Olaitan, S. O. (1991b). Integration in Education: A Case for Agriculture as an Integrated Area of Study. Lead Paper presented at the 6th Annual Conference of the Nigerian Academy of Education held at the Ahmadu Bello University, Zaria.

Olaitan, S. O. and Ajala, A. A. (1987). Agricultural Science in Teacher Training Colleges in Nigeria: An Experience of Three States. In Ayodele, S. O. (ed). Empirical Studies of the Curriculum Issues in Nigeria. Benin City: Curriculum Organization of Nigeria.

Sesay, A. A. (1989). Local Tradesman: A Viable Factor in the Implementation of the National Policy on Education. Nigerian Journal of Technical Education 6 (1&2): 15-21.

Towe, P. (1998). Vision and Mission of Technical, Vocational and Technological Education in Nigeria. In Isyaku, K., Akale, M. A. G., Maiyanga, A. A. and Olokun, M. (eds) Vision and Mission of Education in Nigeria: The Challenge of the 21st Century. Proceedings of the National Conference on Vision and Mission of Education in Nigeria. Kaduna: NCCE.

Wals, A. (2009) Learning for a Sustainable World: Review of Contexts and Structures for Education for Sustainable Development 2009. Paris: UNESCO