

Quality Assurance in Educational Administration in the Teaching of Farm Mathematics for National Integration in Nigeria

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Abstract

Farm mathematics, an aspect of agricultural science education is being taught in our educational institutions in the country. This effort is to enhance agricultural productivity and quality of agricultural science education for national integration. For the realization of this, a quality assured educational administration is vital. The paper therefore dwells on the concepts of quality assurance, educational administration, farm mathematics and national integration. Quality assurance issues in educational administration germane to farm mathematics instruction for national integration are also looked at. The paper then recommends that there should be focused and faithful implementation of quality assurance policy guidelines in our institutions, among others.

Keywords: Quality Assurance, Administration, Farm Mathematics, Integration.

Introduction

Farm mathematics a component of agricultural education is being taught in various ways at all tiers of education in Nigeria. Globally, life sustenance is greatly dependent on foodstuffs from the farm. For this singular reason and for the fact that food demands keep on increasing astronomically, a sound farm education in our educational institution is very germane to national well-being and integration. Hence, Okeke (2007) underscored the fact that rapid and sustainable development of any country can only be achieved through scientific research, rational application of science and technological knowledge and skills. Sound farm mathematics instructions in our schools and colleges play this vital role.

According to Aguele and Usman (2007), mathematics was used in the traditional society, before the introduction of formal education, mainly in taking stock of daily farming and trading activities. These could be seen in the market days and counting systems. In the present system of education, Ajai and Imoko (2011) pointed out that mathematics occupies a central position in the school curriculum including agricultural science education curriculum. It is therefore regarded as the language of science and technology. Its quality must therefore not be toyed with or compromised with anything counter productive in our institutions of learning.

From the foregoing, the desired national integration can be achieved by putting in place, among others, sustainable sound farm mathematics in our schools and colleges. Thus, Ukeje (1997) in Ajai *et al* (2011) while acknowledging the importance and contributions of mathematics to the modern society asserts that without mathematics there is no science, without science there is no modern technology and without modern technology there is no modern society. By extension of this position, if there is no modern technology in our farms and farming activities the society stands to suffer greatly.

Realizing the lifeline significance of mathematics as a springboard to our national development and integration, Nigeria made the subject compulsory at the basic and secondary levels. It is also found to be major component in most courses curricula in tertiary institutions. The aim according to Ajai *et al* (2011) is to ensure the inculcation of mathematics literacy and the associated equipment with logical and abstract thinking needed for living, problem solving and educational furtherance.

In the light of the above, the paper is of the opinion that effective school administration saddled with a lot of responsibilities is very necessary. This is in the quality of teachers teaching farm mathematics and the equipment/facilities put in place in our institutions. Regrettably, those administrative responsibilities coupled with the expected quality assurance in teachers are far from being achieved. Hence, Omoruyi and Omiudu (2006) lamented that to a large extent, the level of teachers' competence and quality in our schools at all levels have fallen short of expectation in recent years.

The Concept of Quality Assurance

Quality assurance according to Borahan and Ziarati (2002) is all those planned and systematic actions necessary to provide sufficient confidence that a product or service will satisfy given requirements for quality. A major characteristic of quality assurance is that it is preventive and operates to prevent mistakes, poor quality and wastages from occurring in the first place (Akagwu, 2012). Comparatively, while quality control is used to uncover defects or faults which have resulted from production processes, quality assurance attempts to improve and stabilize production, and associated processes, to avoid, or at least minimize issues that led to the defects in

the first place (Wikipedia Free Encyclopaedia, 2014). Quality assurance is therefore hinged on the principles of fit for purpose i.e. suitable for the intended purpose and getting things rightly done at the first time.

According to Okebukola (2010), quality assurance is an umbrella concept designed to improve the quality of input, process and output of the education system. To Bandele (2011) it is a label for the process of ensuring for purpose. It is amplified to include academic, administration and infrastructural quality assurance. He warned that detailed schematic representation of the segments sectors of institutions quality must be assured (figure 1).

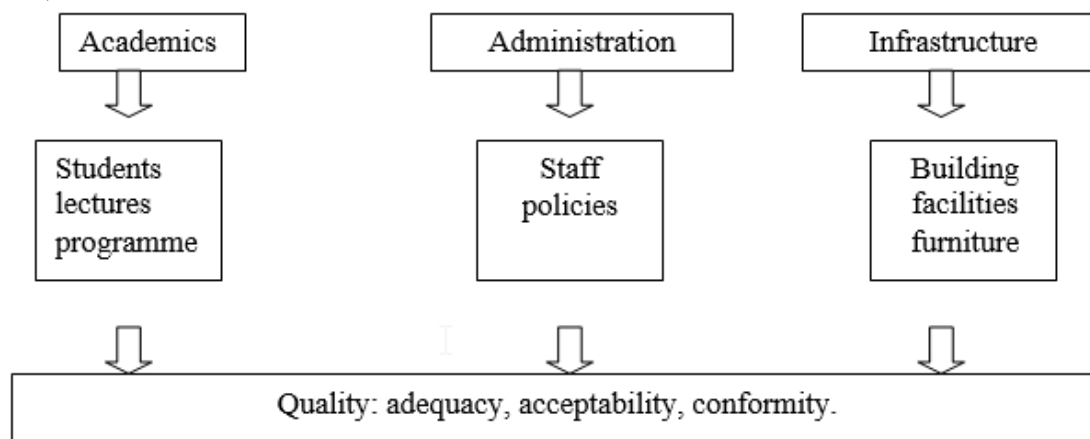


Figure 1: Relationship among Dimensions of Quality Assurance (Bande, 2011).

Quality assurance has components that are internal and external to the institution. The former is for internal quality control, while the later is to norm the institutions with others with similar vision and mission (Bande, 2012). According to Okebukola (2010), a system approach to quality assurance, however demands that dimensions of input, process and output should be the focus. These include quality of school administration, instruction, facilities/equipment and the products (the graduates).

The Concept of Educational Administration

Educational administration has been variously looked at. Nwankwo (1982) in Adah, Agih and Odoma (2014) defined educational administration as the arrangement of the human and material resources and programmes available for education, and carefully using them systematically for the achievement of educational objectives. To Onoja (2005) it is the identification, organisation, and coordination of human, materials, physical and economic resources as well as other available educational programmes toward the attainment of national educational objectives.

Odiba (2000) indicates that school administrations irrespective of the level at which they operate, are concerned with four major issues and functions. These are:

- i) the procurement, training, maintenance, development, evaluation and remuneration of personnel;
- ii) the determination and implementation of the instructional programmes;
- iii) the operation of educational business in all its ramifications (resources, finance, time, etc); and
- iv) the establishment and maintenance of good public relations.

Educational administration could mean harnessing, improving and sustaining both human and material resources required for the growth and development of education (Adah, Omalle and Alhassan, 2009). It is therefore significant that sound and effective farm mathematics instructions are hinged on effective school administration coupled with quality assurance.

The Concept of Farm Mathematics

Farm mathematics is one of the aspects of agriculture/agricultural science education. In contemporary education, mathematics education is the practice of teaching and learning mathematics along with the associated scholarly research (Wikipedia Free Encyclopaedia, 2014). It is mathematical engineering which is the customisation of abstract scientific principles to satisfy human needs (<http://math.berkeley.edu>, 2007). The study of the measurement, relationships, and properties of qualities and sets, using numbers and symbols is mathematics (<http://www.ask.com>, 2014).

To Anthony and Walshaw (2014), mathematics is the most international of all curriculum subjects and mathematical understanding influences decision making in all areas of life-private, social and civil. It is key to many spheres of life including its application in agriculture.

Umaru (1995) in Enemali and Adah (2014), conceptualized mathematics as a language which provides an indispensable means of investigating the nature of things particularly those which are dealt with in the field of

science, technology, engineering and industry; and by extension agriculture and agriculture related disciplines or areas.

From the foregoing, farm mathematics encompasses all forms of measurement on the farm, farm forecasts, farm accounts and record keeping. It also includes all forms of business that have to do with farm and farm products. For these to be realised, qualitative administration is worthwhile.

The Concept of National Integration

To integrate means to combine two or more things so that they work together (Wehmeier, 2005). National integration therefore means the act or process of bringing together two or more things, people and ideas of national interest and development. The aim of doing this is to promote closer economic integration. Hence there is racial integration, technological integration, among others. Farm mathematics being properly put in place by quality assured school administration could help realize the desired national integration.

Quality Assurance Issues in Educational Administration Germane to Farm Mathematics for National Integration

Quality is one out of the lists of strategic objectives for education and training. According to Onga and Okenwa (2011), quality seems to be in opposition to quantity and that in educational system, while quantity is about access and participation in teaching – learning process, quality is primarily linked to the quality of teachers and trainers, the development of skills for the knowledge society, recruitment of scientific and technical studies, investment in education and training, and access to the information and communications technologies, the availability and supervision of which actually will bring about assurance in quality. All these are the supposed roles of educational administration to the educational institutions.

Quality assurance, being a major component of school administration is aimed at:

- i) achieving standards;
- ii) maintenance of minimum standards and the production of parity/comparable interpretation of degrees, etc; and
- iii) ensuring that programmes are of high quality and meet the needs of the Nigerian society (Amdii, 2006)

It is the responsibility of the educational administration, therefore, to realize these aims as they will enhance effective teaching of farm mathematics in our institutions of learning.

In the light of the above, school administration is key to playing some specific roles. According to Omalle and Ochalla (2008) the elements of administration spell out those roles such as planning, organisation, staffing, directing, coordinating, communicating, controlling, reporting, initiating, budgeting and evaluating. These elements are inherent in school administration and if properly utilized in consonance with quality assurance would bring about effective farm mathematics instructions for national integration. Hence, the following specific roles of educational administration in farm mathematics teaching and learning:

Planning: Planning entails specifying goals to be achieved and deciding in advance appropriate actions to be taken to realize the goals (Adah, Omalle and Alhassan, 2009). Here, the choice of curriculum for farm mathematics, physical facilities and equipment are involved. According to Adah, Agih and Odoma (2014), the planning should also take cognizance of the needs of the Nigerian community, the needs of industries around, employment opportunities, funding, among others. The quality assurance component of the administration is not to be undermined in the planning. In planning the curriculum, vital areas of farm mathematics that could bring enhanced agricultural development need to be touched. They include various farm measurements (weights, lengths and volumes), introduction of mechanical devices for planting, tending, harvesting, and processing of various food crops as well as various operations in livestock production practices. This is necessary because it has been reported that increase in food supply (Balogun, 1982) has been possible courtesy of mathematical modelling, an aspect of computational mathematics (Ajai *et al*, 2011).

Organizing: This is the mental identification, mobilization and utilisation of resources (Nongo, 2003). The administrators in the system should therefore put into working order the activities within. It involves rightful placement of students into agriculture disciplines where farm mathematics is taught, designing the suitable timetable for the programme and adequate follow up to all the organizing elements for the realization of the desired goals.

Staffing: Staffing is the most important quality assurance demanding element of school administration. This is the life of the system. The success of farm mathematics instruction/programme is hinged on the adequate number of good quality teachers/staff recruited for it.

Directing: This encompasses telling, showing and managing, leading, guiding, stimulating, actualizing and counselling the human elements within the system to contribute adequately to set goals. All these are quality assurance inputs.

Coordinating: This is all about putting the resources into proper relation for better and effective functioning of

the activities within the system. This is in the area of personnel, money and materials for teaching farm mathematics which requires being coordinated.

Communicating: This involves staff meetings, giving circulars, notices about activities, events decisions and tasks which affect individuals and groups in the system.

Reporting: This is very vital in quality assurance because assignments, responsibilities or duties carried out require reporting back for further positive decisions if need be.

Initiating: For a system to be well integrated, new ideas with the necessary dynamism and quality assurance checks are worthwhile. The farm mathematics teachers should be found to be innovative enough.

Budgeting: For the success of any organization or endeavour, budgeting of funds is required.

Evaluating: A good quality assurance concerns itself with the successes/failures of the organisation or programme. This is all about the assessment of the worth, desirability and effectiveness of farm mathematics instructions. The result of such evaluation need to be reacted upon by the administration and staff with minimum delay.

Conclusion

The paper has so far highlighted the fact that farm mathematics contributes to the development and improvement of agriculture through mathematical modelling. Due to this lifeline significance of the course, it is compulsorily being taught in our institutions of learning. For its proper pedagogy, quality assured educational administration is worthwhile and should be well sustained. This is one of the surest ways of realizing national integration in the country especially for the fact that mathematics is the bedrock of science and technology. In the light of the above, the following recommendations are made:

- i) There should be focused and faithful implementation of quality assurance policy guidelines in our institutions. This can be possible through the establishment of both internal and external quality assurance units of the institutions.
- ii) There should be increased funding of institutions of learning by their owners as no administrator can succeed in running educational institutions without money. For instance, money is needed for procurement of laboratory materials, payment of staff salary, training and retraining of staff. All these are correlates of quality assurance.
- iii) Mathematical and agricultural facilities should be provided in our institutions of learning. These include adequately furnished or equipped mathematical and agricultural laboratories, among others.
- iv) Enough qualified staff should be employed, adequately motivated by way of special allowances and proper supervision.
- v) Those in charge of quality assurance unit of the institutions should be given freedom enough to monitor the entire educational programme.

References

- Adah, O.C. Agih, M.A. & Odoma, D.A. (2014), The role of educational administration in empowering individuals and communities through technical, vocational education and training. *Journal of Vocational and Technical Educators*. 4(3) 129-132.
- Adah, O.C. Omalle, M.C. and Alhassan, Y. (2009), The role of educational administration in vocational and technical education for the attainment of national educational goals. In Daluba, N.E. (ed.) *Vocational and Technical Education and the Attainment of National Education Goals*. Kaduna, Euneeks & Associates. 72 – 78.
- Aguele, L.I. and Usman, K.O. (2007), Mathematics education for dynamic economy in Nigeria in the 21st century. <http://www.krepublishers.com/02-journals>. Accessed on 09/10/014.
- Ajai, T. J. and Imoko, I.B. (2011), Mathematics education as tool for sustainable national development and for addressing Nigerian challenges in the 21st century. *Nasher Journal* 9(2) 95 – 101.
- Akagwu, R.R. (2012). Quality assurance: An instrument for achieving qualitative and functional education objectives of vision 2020-20 in Nigeria. In Ekuje, F.T. (ed.) *Vocational and Technical Education as a Tool for Achieving Vision 2020-20 in Nigeria*. Ankpa, Roma Communications.
- Amdii, V.L. (2006). Social studies teacher education training in Nigeria for effective teaching in Book of proceeding of the Faculty of Education, University of Abuja. 442 – 451.
- Anthony, G. & Walshaw, M. (2014), Effective pedagogy in mathematics. Educational Practices Series 19. <http://www.iaoed.org> & <http://www.ibe.unesco.org>. 1 – 32.
- Balogun, T.A. (1982). Science society and science teaching effectively in Nigeria. *Journal of STAN*. 2(12) 23 – 30.
- Bande, S.O. (2011). Quality assurance for security assurance in Nigeria. *Nasher Journal* 9(2) 1 – 7.
- Borahan, N.G. and Ziarati, R. (2002), Developing quality criteria for application in the higher education sector in Turkey. *Total Quality Management*. 13(7) 913 – 926.

- Enemali, I.A. & Adah, O.C. (2014), Empowering individuals and communities through agricultural education: The role of mathematics education. *Journal of Vocational and Technical Educators*. 4(4) 46-50.
[http://math.berkeley.edu\(2007\)](http://math.berkeley.edu(2007)). Meaning of mathematics. Text of a plenary presentation of the 2007 NCTM Annual Meeting, March 23, 2007 in Atlanta. <http://math.berkeley.edu/-wu/c49-1pdf>. Accessed on 04/09/014.
- [http://www.ask.com/results\(2014\),What is mathematics?](http://www.ask.com/results(2014),What%20is%20mathematics%3F) <http://www.ask.com/results>. Accessed on 04/09/014.
- Odiba, H.E.(2000), *Introduction to educational administration*. Ankpa, Bencaz prints.
- Okebukola, P. (2010). Fifty years of higher education. Trends in quality assurance. A paper presented at the International Conference on the 50th Independence Anniversary at Abuja 27 – 29 September, 2010.
- Okeke, E.A. (2007), Making science education accessible to all. 23rd Inaugural Lecture of the University of Nigeria, Nsukka. 9th August.
- Omalle, A.I. & Ochalla, M.S. (2008), The role of administration in vocational and technical education for the attainment of national education goals. A paper presented at the 4th Annual National Seminar and Exhibition, School of Vocational and Technical Education, Kogi State College of Education, Ankpa. 11th – 13th March.
- Omoruyi, F.O. & Omiunu, S.E. (2006). Appropriate strategies for enhancing teachers' competence for quality teaching in Book of Proceeding of Faculty of Education, University of Abuja, October, 2006. 425 – 432.
- Onga, P.O. & Okenwa, B.C.N. (2011), Application of quality assurance to technical and vocational education and training as an empowering agent for better 21st century Nigeria. *Nasher Journal* 9(2) 39 – 3.
- Onoja, F.A. (2005). The role of educational administration in sustaining sandwich programme in science, technology and mathematics education in Nigeria. In Omonu, J.B., Audu, T.A. & Agashi, P.P. (eds.) *Sandwich/part-time Programme and Science, Technology & Mathematics Education in Nigeria*. Anyigba, Sam Artrade Publishers. 15 – 149.
- Wehmeier, S. (2005). *Oxford advanced learners dictionary*. Oxford, University Press.
- Wikipedia Free Encyclopaedia (2014). Concept of mathematics education. <http://en.m.wikipedia.org/wiki>. Accessed on 04/09/014.

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