



Towards Challenges of Curriculum Innovation in Teaching Science Subjects in Nigerian Secondary Schools

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ABSTRACT

Nigerian Curriculum is too complex in the area of faster learning. Most especially in the Science Subjects, Most of our Current Senior secondary schools particularly public Schools lack Science apparatus for teaching and learning process. In order to tackle some of these problems there is need to think about curriculum innovation in order to transform teaching and learning of science Subject affectively. Innovations are useful in any educational system and in curriculum, because it is man's means of survival in a rapidly changing environment. Hence, the strength of any society depends to a large extent on its curriculum. The technological strength of Nigeria depends squarely on the school science curriculum knowing that science and technology are tools for sustainable national development. Various sciences curricular have been designed to help achieve the objectives of science education. The delivery of this curriculum towards the set scientific and technological goals is challenged by many factors. This paper therefore examined challenges of curriculum innovation in the sciences in senior secondary school, such as the need to teach and learn science through new technologies, inadequate funding, lack of infrastructures, equipment and materials, inability of teachers to effect the desired innovation, amongst others, Although the challenges seem enormous, there is hope for the future. Suggestions are also given which will help improve the science curriculum delivery in secondary school in Sokoto state as well as implementation of the innovations.

Keywords: Concept of curriculum, curriculum innovation, science curriculum

INTRODUCTION

Education is an important tool for development, as well as the vital element in the process of social change, technological and economic growth. Such development, growth and change usually occur with the curriculum, which serves as the instrument through which the desired changes in the society envisaged by the educational policy are given concrete manifestation (Inyong, 2009). To ensure excellent curriculum plan at the implementation state curriculum innovation has to be given consideration, the fact that the educational system has undergone major structural changes.

That is from pedagogical methodology to the current phase of more sophisticated. Furthermore, the prominent role of curriculum Innovation in the advancement of knowledge and skills necessary for effective functioning in the modern world has been stressed, but it should be noted that the effective introduction of new ideas into our curriculum, educational system, and subsequently into the classrooms and other societal settings, is a complex, multifaceted process that involves not just the technology, but indeed, enough initial financial capital for acquiring the technology; but also the right curriculum and pedagogical manpower, institutional readiness, teachers' competences, and long-term financing among others (Umoh, 2006)

The paper therefore examines the concept of curriculum and curriculum innovation.

Concept of Curriculum

There are several definitions of the word 'Curriculum' by different scholars in the field. One of the most universally accepted of these is that provided by Tanner and Tanner (1975) who defined the term as planned and guided learning experiences and intended learning outcomes, formulated through the systematic reconstruction of knowledge and experiences, under the auspices of the school, for the learner's continuous and willful growth in social competence. This definition shows that when curriculum is well planned it will lead to all round development of the learner. Okonkwo and Ozurumba (1989) stressed that curriculum is a planned and directed activity programme meant to facilitate the achievement of educational purposes.

Educational purpose can only be achieved if the curriculum content and learning experiences are well implemented. As noted by Ogboji (2008) Nigeria system of education has to be geared towards self-realization, better human relationship, individuals and national economic, political, scientific and technological progress.

A worthwhile curriculum is never static. It is dynamic. When analyzed, the intended objectives, the learning experiences, the methods of instruction, the method of evaluation, all parts of or steps in curriculum development have continued to change.

According to Mohammed (2007), curriculum is the experience a school system provides for its students. It can be viewed as all the experiences/activities (co curricula activities) provided under the auspice of school to bring about a change in the leaner in the desired direction. Ibrahim and Yahaya, (2008) defined the term curriculum as a systematically organized course of teaching and learning. In formal education or schooling, a curriculum is the set of courses, course work, and content offered at a school or university. As an idea, curriculum stem from the Latin word for race course, referring to the course of deeds and experience through which children grow and mature in becoming adults.

Curriculum refers to the lessons and academic contents thought in a school or in a specific course of study or programs (glossary of educational reforms 2015). Curriculum can also be seen as the sum total of what the students should learn in the school or outside the school under the guidance of teachers. For any nation, community and society to experience economic growth there must be a strong stimulation and growth in the teaching and learning of science. Hence a sound science educational system is accepted the world over as the bedrock of human development and progress. Science is the foundation upon which any technological breakthrough is built. (Gbamanja, 1991) stated that science is an organized and systematic knowledge dealing with man's understanding of the national powers. In the conditions of modern life, a scientifically and technological illiterate person is considerably circumscribed as playing his full potential in the socioeconomic development of his community.

Science Curriculum can therefore be viewed as all the experience in science provided by the school for the achievement of goals of science education and learning. (Adeyegbe, 2004) submitted that curriculum generally is the hub of the activities in any educational endeavors, since it dictate what is to be taught, at what level, by whom, with what equipment and for what purpose and assessed by what means. This then implies that science curriculum does not only dictate but also direct/guides every other process of implementing the programme of activities (Ugwu, 2008).

Science education has introduced a lot of changes in our world today and it will continue to do so in the future (Orukotan, 2007). Achievement in science education will go a long way in reducing illiteracy and poverty which are impediments for national development. In modern science, science teaching should be such that enabled young people have access to new knowledge to expect changes and to behave rationally and creatively towards the problems generated by changes. This is because to ensure change will mean progress (Afangidan 2006). This progress mean exploring new avenue to achieve a better result or result which is synonymous with the result but makes the new result well understood and easier to follow than the old technique. For the progress to be meaningful and scientifically reasonable, the science teachers, curriculum developers and planners must be innovative.

Curriculum Innovation

Innovation in science education curriculum is inevitable in order to meet man needs. Curriculum innovation refers to change in both methodology and content of the subject matter. Such change influences the essence and the method of performance of the learning activities. The change must be

monitored and assessed to ensure that it is achieving the goals specified and that the effects of the change meet the expectation of both the designers and users (Udo, 2005). Okoye (2009) viewed curriculum innovation as ideas, approaches and materials introduced into education to improve the content of the curriculum in order to make it more relevant to the varying need of the learner and to every changing need of the society by improving instructional strategies and techniques in order to help the learners to learn faster and better improve organization of learning experience in order to make teaching-learning activities more meaningful and less tedious. Innovation must be tied to the end product and improvement of education. This is because the essence of introducing innovation in the curriculum is to effect

Some change that are expected to improve on the present educational practices that have been judged as deficient and incapable of meeting the aspiration of the ever-changing society of today.

Ughamadu (2006) maintained that curriculum innovation is quite vital as

- I. Curriculum innovations are directed towards improving performance of the school system so as to be result oriented. Hence any innovation introduced into the school curriculum must take into consideration the system of the school.
- II. It provides the mean of trying new research findings.
- III. It Enables education practices to change from time to time so as to reflect the consequent changes in the society.
- IV. Enables classroom teachers to solve some instructional problems which they occasionally encounter in the teaching and learning setting.
- V. Enables classroom teachers to acquire new knowledge that will make them more effective and productive.

Challenges of Science Curriculum Innovation in Secondary Schools

There are a lot of challenges in curriculum innovation in the sciences secondary schools making it difficult for good quality education that is empowering and capable of bringing about sustainable development to be provided. Akpan (1999) noted that, since 1968s government have been making efforts to improve science education in Nigeria such as restructuring of science curriculum content, regular teacher education programme for serving teachers, incentive to school teacher by government, improve evaluation technique and strategies and review of infrastructure in school to create better opportunity for science teaching and learning. Despite these efforts, challenges of science teaching and learning in term of innovation still persist for teachers, students and educational bodies.

1 there is the need to teach and learn science in the senior secondary school, through new technologies brought about by recent innovation. Recent technologies challenge the traditional teacher-centered learning because they provide instant access for students to materials prevailing supplied by the teacher, it enhances the role of the teacher as manager of the learning process rather than the source of content. These techniques include, the use of computer, simulation instruction, Computer Assisted Instruction (CAI), Computer Based Learner (CBI), E - learning. Nigeria enhanced a policy on computer education in an attempt to keep pace with technological development worldwide. The plan was to establish pilot schools and diffuse the innovation thereafter first to all secondary schools and later to primary schools. However the plan could not go beyond distribution and installation of computers in schools. Hence the chalkboard and textbooks continue to dominate classroom activities in secondary schools in Nigeria. This is a major challenge.

2 challenges in innovation is the emphasis on active learning technique. Active learning as the name suggests is a process whereby learners are actively engaged in the learning process rather than passively absorbing lectures. Hence the usual problem solving approach like Fieldwork, guided discovery, project, laboratory works, programmed Instruction need to be sustained to enable students acquire 'hand-on' and 'minds on' skills. Active learning generates and sustains motivation and a student who is so motivated learns more easily (Abba and Ubandoma, 2008). Students have a sense of achievement as active learning encourage creativity and reduce conformity.

3 is the challenge of inadequate funding. Most often curriculum innovation faces a lot of problem, because of inadequate funds to recruit qualified teachers, train and retrain the teachers, recruit capable technicians and supportive staff, build laboratory for practical to cope with the innovation.

Aguokobguo (2002) and Ereh (2005) identified lack of funding as a major factor that militates against curriculum innovation and implementation. Where there is inadequate fund, the anticipated change will suffer a serious setback because it will be difficult to implement an innovation effectively and efficiently (Ughamadu, 2006)

Challenge of infrastructure, equipment and material due to inadequate funds. Science is an activity based and students centered and cannot be taught effectively without equipment and infrastructures. Also an innovation may not be fully effectively and efficiently implemented in the absence of these facilities and this will impede achievement of anticipated results. This challenge has given room or provided excuses for teachers who now neglect the practical aspect which is weightier and has greater potential for developing critical thinking and objective reasoning ability in the students (Nwagbo, 2006). Instead, they resort to expository method of teaching which is known for promoting rote learning and thus hindering transfer of learning.

4 there is also the challenge of most teachers, administrators, ministry of education officials being too conservative to effect changes. They are often time suspicious of any new technique or innovation thus militating against any curriculum change. Inability of teachers to effect the desired change or innovation is a great challenge because teachers are the core implementers of curriculum that is to say the success and the failure of curriculum depend to a large extent on the teachers, Any innovation call for knowledge, understanding technique and other abilities. Where these are lacking then the knowledge gap will be a challenge in curriculum innovation. This will make the teacher unable to implement the curriculum.

5 Lack of awareness on the importance of curriculum changes or innovation is a major challenge. The society is dynamic and ever changing yet, some people are illiterate of the need for Science Curriculum Innovation, in addition, they are also unaware that, advance in science and technology usually call for extensive curriculum reconstruction so that the school does not expose the learner to irrelevant knowledge and skills.

6 lacks of appropriate channels of communication necessary for dissemination of information about the revised curriculum is bound to disrupt the implementation of such a new curriculum. In fact, information about any curriculum innovation that is not properly and adequately disseminated to all the people concerned with the implementation will suffer some setbacks.

CONCLUSION

This paper was Conclude that, Science is an indispensable tool for societal challenges, human and national development. Issues concerning the teaching-learning of science must be taken very seriously. Curriculum issues especially on innovation cannot be relegated if the purpose of science education is to be actualized. Both prospective and in- service teachers, school administrators, ministry of education officials arid other curriculum implementer should be well grounded and updated respectively on issues of curriculum innovations.

RECOMMENDATIONS

- I. Implementers of the curriculum (teacher) should be adequately motivated for improved efficiency and effective performance and they should be carried along.
- II. Schools within our educational levels should be connected to the internet to enable teachers and students access information in conformity with the rapid demand of globalization which necessitated innovations.
- III. Though there are challenges in innovation, the curriculum should still be reviewed from time to time in order to align it in a position to adequately address emerging issues at appropriate time.
- IV. Government should have the political will as well as deliberate policy of pursuing science education. This should go beyond showing huge budgetary allocation to education (science and technology) which are most; time not feasible.
- V. Training and retraining of teachers should be an integral part of the curriculum so as to cope with innovations. Education is dynamic so practitioner in the field should be dynamic.

REFERENCES

- Abba, I. & Ubandoma, Y. (2008). Global Challenges in the Science Technology and Mathematics Education (STME) Curriculum 49th Proceeding of the Annual Conference of STAN pp 15-17
- Adeyegbo, S. C. (2004). Research into STM Curriculum and School Examination in Nigeria. The State of the Art 45th Annual Conference Proceeding of STAN pp 70-80
- Afangideh, S. F. (2006). Strategies for effective teaching of science subjects in secondary schools. A Paper Presented during an in-house Seminar organized by Science Teachers of Notre Dame Girls Secondary School, Akwalbom State.
- Aguokoghuo, C. N. (2002). Problem and Prospect of Secondary School; Curriculum in Nigeria. *Nigeria Journal of Curriculum Studies* 9(2), 92-97.
- Akpan, B. B. (1999) (Ed). Prospective on education and science teaching, from the eyes of UduogieIvowi, Abuja-Nigeria. Foremost Education Service Limited.
- Ereh, C.E. (2005). Teacher Characteristics and School Curriculum Implementation in Nigeria Secondary Schools. A Theoretical Review. *Journal of the Nigeria Academy of Education* 3(1) 111-120.
- Gbamanja, S. T. P. (1991). Modern method in science education in Africa. OwerriTotan Press.
- Mohammed, M. B. (2007). Selected Classroom Practice for Improving the Science curriculum in Nigeria.50thAnnual Conference Proceeding of STAN49-51.
- Inyong, A.U. (2009). Curriculum innovation and information and communication technology (ICT): Implications for counselling. *Journal of Curriculum Studies*, 16 (2).
- Umoren, E. (2006). Information and communication technology and curriculum. *Nigerian Journal of Curriculum Studies*, 2 (1).
- Tanner, D. & Tanner, L. (1975). *Curriculum Development Theory*. New York: Macmillan.
- Nwagbo, C. (2006). Effect of Two Teaching Method on the Achievement in and Attitude of Students in Different Levels of Scientific Literacy. *International Journal of Education Research* 45(2006). 216-229.
- Nwagbo, C. (2008). Science, Technology and Mathematics (SIM) Curriculum Development focus on Problem and prospects of Biology Curriculum Delivery. 49th Annual Conference Proceeding of STAN pp 77-81.
- Okoye, N. S. (2007). *Theory and Practice of Curriculum Development for Nigeria Students*. Abraka: Delsu Investment Ltd.
- Okonkwo, C.E. & Ozurumba, M.M. (1987). *Fundamental Concept in Education*. Owerri: Tota Publishers Ltd.
- Orukotan, A. F. (2007): Curriculum Enrichment of STM Education as a Basis for Sustainable Development. 50th Annual Conference Proceeding of STAN. Pp 3235.
- Udo, E, (2008). Activity Techniques and its Implications for Science Curriculum Innovation in Nigeria. 49th Annual Conference Proceeding of STAN. 36-40
- Ughamadu, K. A. (2006). *Curriculum Concept, Development and Implementation*. Onitsha Lincel Publishers.
- Ugwu, A.N. (2008). Current Issues on Implementation of Senior Secondary School Science Curriculum in Nigeria. 49th Annual Conference Proceeding of STAN Pp 23-26