

# INSTRUCTIONAL MATERIAL UTILIZATION FOR QUALITY INSTRUCTIONS IN SCIENCE EDUCATION

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## **Abstract**

The concern for ensuring quality education and in particular making our Science Education functional calls for improvement on the type of instructions that go on in our science classes. Efforts by government in reviewing and producing various curricula call for complementary efforts by science teachers to ensure that quality instructions are given, utilizing instructional materials. This paper has reviewed the application of instructional materials in science instructions and some of the problems militating against effective use of these instructional aids. The problems are mainly in the areas of availability, lack of skills/competence and commitment on the part of teachers as well as in maintenance of the existing ones among others. Recommendations made include improved funding by government, improvisation by teachers, proper training of pre-science teachers as well as in-service training of practicing teachers.

## **Introduction**

Owing to the ever-increasing growth in science and technology worldwide, there is need to provide qualitative science education at all levels of our education system. Science education has continued to attract a lot of attention from both government and science educators. Much of the emphasis is on how to make science education more functional with regard to improving the teaching and learning of science and producing products or graduates of science who can not only function in the modern world but also enable Nigeria compete in the global growth in science and technology.

Several factors have been identified as militating against effective instructional delivery in science classes. These factors include lack of qualified science teachers, lack of interest on the part of pupils, poor infrastructural facilities, inadequate use of instructional materials among others. Instructional delivery can be improved upon by the utilization of instructional materials. Instructional materials include materials, equipment and aids that the classroom teacher employs to aid the learning activity. Instructional materials serve the function of enriching science instructions if they are properly utilized. They also serve in improving the quality of instruction.

## **Issues of Quality in Education**

The Nigerian government through the Federal Ministry of Education has continued to stress the importance of education in the lives of the citizens. In the text of 2004 ministerial press briefing by the minister of education, it was stated that government strongly believes that the objectives of job creation and poverty reduction can only be realized through appropriate education which empowers the products of the education system with skills and competencies to become self-employed. In another special report on the state of education in Nigeria as contained in *Newswatch* of July 5, 2004, the expanded definition of the quality of education was stated as "It including "the inculcation of sound moral, ethnical and religious education in young people in such a way as to make them good citizens of their countries and the world".

The importance of quality in education cannot be overlooked. The theme of the 2004 ministerial press briefing is repositioning education for reform and development. The efforts of the Federal government at providing quality education to the citizens of Nigeria are clearly seen, especially in the birth of several government institutes, agencies or parastatals aimed at meeting the multiple challenges facing educational development in the country. Among these, we have the Nigerian Education Development Council (NERDC) formed in 1988 and the Strategic National Education Plan (SNEP) in October 2003. The NEKDC is saddled with the responsibility of improving policy oriented research, curriculum development and use of Nigerian and foreign languages for effective teaching and learning. Reporting on the achievements of the NERDC, Atojoko (2004) stated that the Special Programme Centre, SPC, of the NERDC, in 2001, produced a handbook on how to improve the effectiveness of educational

resource centers in Nigeria. The policy thrust of the SNEP is to ensure adequate preparation (if our youth for the world of work and ability to bridge the digital and technological divide; (Federal Ministry of Education, 2004).

Further to government emphasis on education, the Commonwealth Ministers of Education in their message to the Commonwealth Heads of states meeting CHOGM in Abuja 2003 had the crux of their message that education is an important instrument of change and also an important element in human capital development and important in the preparation for participation in governance and even in normal lives, in alleviation of poverty and eradication of disease.

The curriculum development, for instance for primary science has adequate content. The NERDC outlined some objectives desirable from adequate implementation of the curriculum which among others include bringing quality and relevance into the teaching of science with a view to laying a solid scientific and technological foundation (Inuwa, 2002). All these point to one thing - the implementation of the curriculum which function lies heavily on the classroom teachers. This is the basis for which this paper advocates for quality instructions in science classes through the teachers' utilization of instructional materials.

### **Instructional Material Utilization in Science Instructions**

Instructional aids, according to Yero (2000), could be any device, piece of equipment, **graphic** representation sound reproduction or illustration that helps the pupil to learn. Instructional materials can be classified according to their appeal to the two main senses of sight and hearing. Thus, classification fall under the categories of visual materials, auditory or audio materials and audio-visual materials.

Instructional materials prove to be very useful, not only in the skills that go into the cognitive domain but also to those that go into the psychomotor and affective domains. Their impact is effected through the communication they enhance via the sense organs of the vital attributes of the substance (Otubelu, 1997).

The trend in the use of instructional materials, according to Otubelu (1997). is that instructional materials are hardly utilized in schools. While little use is made of them in the nursery and primary schools; for the secondary and tertiary level, students still learn without them. Again, in evaluating the STM resource material usage, Eniayeju; Eniayeju and Abiodun (2000) show that a significant proportion of STM teachers are not taking advantage of the suggested activities and instructional materials given in the STM curricula when preparing their lessons.

This observable trend leaves nobody in any doubt that the quality of education has greatly suffered in our schools due to the little attention given to instructional materials and their importance in schools.

For instructional materials to be properly utilized, some guidelines and principles should be followed. Okafor (2000) outlined a number of these guidelines and principles to include that the teacher should bear in mind that the instructional materials should be related to the instructional objectives of the lesson; a variety of instructional materials should be utilized to take care of individual differences; students should be actively involved in their use; the teacher should make use of attention calling devices such as arrows and pointers; their presentation should be appropriate in terms of timing and that these materials should be properly maintained.

### **Problems Militating Against Effective Use of Instructional Materials**

#### **1. Non-Availability**

One of the problems militating against the use of instructional materials is the non-availability of the materials. With the era of scarce resources and poor funding by government, schools hardly provide for the instructional materials to be used by classroom teachers. Teachers are then left to source for or provide the materials. In view of the enormous amount of materials that could be utilized for instructions, it can be said that only few of these are readily available.

#### **2. Lack of Ingenuity and Commitment on the Part of Teachers**

Teachers lack commitment to source for instructional materials. For the available resources, they sometimes lack the skill and competence to effectively utilize them. The efficacy of instructional materials in instructions depends to a large extent on the teachers' careful selection and skillful use of the materials.

### **3. Poor Maintenance Culture**

Instructional materials provided for classroom instructions are usually preserved or stored either in the classrooms, school stores, laboratories, etc. Some are retrieved from their storage environment when the need arises. The equipment and materials need to be well preserved. Repairs or services, which should be done from time to time, are often not done, with the result that some of them get badly damaged. Absence of skilled technicians and teachers' lack of skill jeopardize the proper maintenance of the equipment and materials. This poor maintenance culture can only deplete or reduce the number of existing materials and equipment needed for classroom instructions.

### **Recommendations**

In view of the tremendous benefits in the effective use of instructional materials and the associated problems militating against their use or encountered in their use, the following suggestions / recommendations are made for effective utilization of instructional material for improving the quality of instructions.

#### **1. Funding**

Improved funding of schools by government is recommended as increase in funds allows for the purchase or procurement of instructional materials. Schools should also make efforts to boost the school funds through the PTAs, NGOs and philanthropic individuals. •

#### **2. Improvisation**

Teachers should improvise instructional materials by providing cheaper substitutes that can replace expensive equipment and materials. It requires a little motivation on the part of teachers to search for materials within the environment that can be of immense benefit to pupil understanding of scientific concepts. Ogwo (2004) opined that teachers' motivation should be intrinsically drawn if they must improvise for effective instructions. Improvisation, according to Ogwo (2004), is not limited to providing substitutes but could also be conceived as when the teachers' lack of skills and knowledge is remedied by inviting a resource person to handle certain topics or concepts.

#### **3. Teacher Education**

Pre-service teachers should be taught to utilize instructional materials not only for reasons of assessment during the teaching practice exercise but also to appreciate their true value in instructions. Teacher educators should take time to demonstrate these in microteaching classes where the skills are taught - in terms of timing, application, variety, illustrations, comparisons, etc.

#### **4. Supervision**

Practicing teachers need to be supervised within the framework of the school hierarchy not just supervision by staff of the Ministry of Education or the Education Commission. Appraisal of the teachers can also include consideration of their ingenuity on the provision and use of instructional materials.

#### **5. Organizing Workshops and Seminars for Teachers**

Teachers need to attend workshops and seminars or conferences on the provision and use of instructional materials. These workshops can also serve to train teachers on the skills of maintenance of instructional materials.

#### **6. Proper Maintenance of Equipment and Materials**

There is need for proper maintenance of equipment and materials used for instructions. The materials should be properly stored and serviced if there is need. One other way of ensuring that they are in good working condition is b) making use of the instructional materials rather than dumping them without use. When they are kept for too long without use, the tendency is for the materials and equipment to get damaged. Undoubtedly, some of the equipment need expertise for their repairs and maintenance. The technicians are scarce but this is the more reason we need to train skilled scientists.

### **Conclusion**

In pursuance of the goals of science education, efforts have been made by the government to improve the quality of education. Several curricula have been developed, sometimes, with poor implementation by classroom teachers. The need for quality in education cannot be overemphasized. This quality can be ensured from the point of instructional delivery. With instructional materials, instructions in sciences are improved, students' interests aroused, inquiry fostered, but in their absence, instructions become impoverished.

The problems of scarcity of instructional materials, teachers lack of motivation in sourcing for these materials and poor maintenance culture can be tackled from improved funding of schools by government, sourcing of funds by schools, improvisation by teachers-, training teachers to be skilled not only in the provision of the instructional materials but also in acquiring proper maintenance culture for the existing instructional materials and equipment.

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