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# An Overview of the Relevance of Instructional Materials in Early Childhood Care Education

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**ABSTRACT**

As the contemporary Nigerian academic system is gradually shifting towards constructivism, a theory that solely believes in entrepreneurship education, it is essential that the classroom teachers become conversant with the type of instructional materials, which can be used in any teaching/learning situations. Instructional materials as it is said are synonymous with what we call 'teaching aids' here in Nigeria. Instructional materials constitute alternative channels of communication, which a teacher can use to convey more vividly instructional information to learners. They represent a range of materials which can be used to 'extend the range of experience the learners need in teaching-learning situation. Educationists have realised the importance of these instructional materials for effective classroom teaching and learning. Hence, it is essential that teachers bridge the gap between theoretical and practical knowledge via the use of instructional materials to facilitate effective teaching and learning. This paper therefore, relies in constructivist theory in presenting an overview of the relevance of instructional materials in early childhood care education and thus recommended among others that the use of instructional materials to explain concepts, principles and theories to enhance outstanding achievement and retention among the early learners.

**Theoretical Framework**

This study is guided by the theory of constructivism by Jean Piaget (1968). Constructivism is a theory of learning that argues that humans generate knowledge and meaning from an interaction between their experiences and ideas. Constructivism views learning as a process in which the learners actively construct or build new ideas or concepts based on current and past knowledge or experience (UNESCO, 2004).

It is also known as social constructivism. Social constructivism posits that knowledge is constructed when individuals engage socially in talk and activity about shared problems or tasks. Piaget further noted that children should learn using their senses to help them acquire knowledge and skills to enhance their learning. Children should therefore, should be provided with various materials to manipulate using their hands, to look smell and taste. According to Piaget, children undergo cognitive development stages. In the concrete stage they are able to carry out mathematical activities involving sorting and grouping, matching comparing and ordering of objects. All these activities should involve real concrete materials from the environment. Basing the study on effect of instructional materials on pre-school children's performance in learning of number work, the theory emphasises on the use of concrete object that enables the learners to acquire number work skills by manipulating the real objects enables them to generate knowledge ideas and meaning from their experiences. Learning should be from known to unknown.

In learning situation teachers should give children plenty of activities and real concrete materials from the environment to manipulate since children develop logical thinking and acquire problem solving skills besides providing plenty of materials. The theory is concerned with children, rather than all learners.

**Piaget Early Child Psychology as a Base for Promoting Instructional Materials among Children**

This theory can only apply to a certain group of children in primary school. It focuses on development, rather than learning, so it does not address learning of information or specific behaviour. This can be compared to constructivist teaching because the process of learning is very important, but it is also different because the process of learning in constructivist teaching which is just as important as the product of learning. It proposes discrete stages of

development, marked by qualitative differences, rather than a gradual increase in number and complexity of behaviors, concepts and ideas (Okeke, 1990).

Jerome Bruner was greatly influenced by the work of Piaget. He was interested in the general nature of cognition (conceptual development). He has given additional evidence suggesting the need of firsthand student interaction with the environment. It's not surprising that the current research has established a substantial relationship between the use of manipulative, materials and student's achievement in the mathematics classroom. Learning theorists have suggested for sometimes that children's concepts evolve through direct interaction with the environment and materials provide a vehicle through which this can happen. This message has been conveyed in a number of ways: Piaget (1971) suggested that concepts are formed by children through a reconstruction of reality not through an imitation by the provision of firsthand experiences in a child's education program. Bruner (1960) indicated that knowing is a process not a product. Enactive learning involves, hands-on or direct experience. Symbolic learning is that stage where one uses abstract symbols to represent reality. Bruner demonstrates that key to readiness for learning is interaction central development, or how a child views the world (Mkpa, 1987).

**Concept of Instructional Materials:**

Instructional materials refer to those alternative channels of communication, which a classroom teacher can use to concretize a concept during teaching and learning process. Traditionally, classroom teachers have relied heavily on the 'talk-chalk' method during their teaching. But recently, instructional materials help to provide variations in the ways in which messages are sent across. In using instructional materials teachers and students do not only extend the range of sense organs we use but also extend the range of materials used for conveying the same message through the same organ.

For instance, in teaching a topic, a teacher can manipulate real objects or use their stimulators. Instructional materials therefore constitute the media of exchange through which a message transaction is facilitated between a source and a receiver. In addition to extending the range of materials that can be used to convey the same instructional message to learners, instructional materials also facilitate the 'process' nature of communication. In this passage, the process nature of communication implies that both the source and the receiver of a message are actively involved in a communication encounter. In fact, it means that both the

receiver and the source share and exchange ideas, feelings in any communication (Tyler, 1987, Dike 1989).

**How do Instructional Materials Accentuate this 'Process' Nature of Communication?**

Instructional materials do so because they constitute tangible products, which can be used by learners. During such usage, a learner interacts with the material. Such interaction may entail that a leaner manipulates the instructional material and expresses his/her views about the problem and idea encapsulated in the material. Then, any feedback obtained from such usage informs the teacher (which is the source) the extent to which a learner has attained an instructional objective. Besides, Nigeria is aware of the importance of instructional materials for effective communication in her school system. In 1975 for instance, the federal ministry of education organised an exhibition of improved instructional materials by classroom teachers all over the federation in four centers- Lagos, Ibadan, Kaduna and Enugu. During these exhibitions participants displayed various types of instructional materials, which they improvised to help learners concretive instruction in different subject areas. Unfortunately, this follow-up was not encouraged. Despite, the federal ministry of education in keeping with its realization of the importance of instructional materials established a National Education Technology Center (NETC) in Kaduna. Also then, states ministries of education have also established units responsible for instructional materials many colleges of education, polytechnics and universities have set up Departments of Educational Technology, at training mechanics in the production and use of different soft ware/hardware materials (Federal Republic of Nigeria, 1977, 1991, 2004).

But despite these increased awareness on the part of educationists, an awareness that led to these establishments, the researcher discovers that Nigerian teachers still rely on the traditional 'talk-chalk' method of teaching. This accounts for this study (Agwu, 2001).

According to Agu Okogbuo (2000) instructional materials in teaching could be classified into:

a. Visual material - such as picture, diagrams buildings, projectors, teachers themselves, chart, real objects (realia) studies etc. These materials such as books, newspapers journals, magazines, pamphlets, handout or modules were also involved.

b. Audio materials such as tape recording, cassette, radio, teleconferencing, language laboratories, teachers' voice. They appeal to the sense of hearing.

c. Audio-visual materials - which include the television, video recording motion pictures with sound tracks, slide and films trips projection with sound tapes, films and multimedia. They appeal to both sense of hearing and sight.

d. Materials/software - include graphic materials, printed materials, slide, filmstrips, overhead transparency, cassette tapes, and motion pictures.

e. Equipment/hardware: examples include: black boards, tape recorders, projectors and video recorders. They are used in presenting materials, static or display such as chalkboard, flannel graph, flip charts, magnetic board are also used in presenting materials or lectures.

f. Electronics - this comprises of radio, computer, e-mail, multimedia. These teaching materials makes teaching and learning process more easy and concrete.

g. Non-projected media include books and other printed materials, objects, specimens. Models mock-up graphical materials, bulletin boards that exhibits, black boards, field trips, simulation and games.

h. Two-dimensional instructional materials in teaching - include flat pictures, graphs, chart, diagrams posters, comics, cartoons, slides, films trips. They are also non-projected materials with characteristics of being flat and light and may be either in opaque or transparent form. They have length but no height, hence they are 2 dimensional aids.

i. Three-dimensional institutional materials - include models, mock up objects, specimens, laboratories, simulation and games (toys). They are non-projected materials. Characteristically, they have length, width, height, hence they are called 3-dimensional. Instructional materials in teaching generally make the teaching process easier. However in order to appreciate the importance of instructional materials in teaching -learning process, Rhert Heinich et al (2001) consider the reasons for using them. They include to help:

a. Gain and hold the attention of the learner

b. Provide visual aspects to a process or techniques

c. Focus attention on highlight of key points

d. Create impact

e. Facilitates the understanding of abstract explanations.

f. Provide a common experience to a large number of learners

g. Stimulate reality: With this, instructional materials in teaching help to concretize the learning process. Words only convey little or no concreteness in the teaching-learning process.

In effect, the type of instructional materials in teaching used depends on what the teacher wants to demonstrate; for instance, the reasons for media is to create clear idea of something e.g. real object (realia) models as follows:

a. To give visual access to something which may be inaccessible to clarity abstract information which may be difficult to communicate verbally. Examples are model picture, photo, posters and diagrams.

b. To condense large qualities of information e.g. diagram and handout.

c. To promote mental activities of students; examples are handout, textbooks, films and picture.

d. To teach language pronouncement e.g. audiotapes.

e. To support work of the teachers e.g. sound recordings.

They make learning more interesting, more real and lively. At all level of education, instructional materials in teaching are very important in the attainment of desired goal and objectives. The traditional chalkboard method of teaching involves only the learning sense of hearing and they easily loose of interest after some time. However, the utilization of instructional materials in teaching and learning situation involves not only the sense of hearing but also the sense of sight and touch, looking at educational practices.

**Type of Instructional Materials:**

Invariably, researcher has observed that before a teacher can design or produce an instructional material, he has to know what these instructional materials are, their advantages and disadvantages, characteristics and limitations, etc. Therefore, some types of instructional

materials could be outlined as thus-graphic materials, three-dimensional materials, still pictures, still projected pictures, motion pictures and Audio materials, etc.

a. Graphic materials: This represent these charts, graphic, posters and diagrams, cartoons, comics, maps and globes which we draw on a cardboard paper or on a piece of cloth and present to our learners to help them visualize what we have been laboring so hard o explain verbally. Graphic materials belong to the finally of two- dimensional material and proportional relationships that may exist among variables in a phenomenon. Graphic materials are used to compress information, to focus and captivate attention, to vary stimuli presented and as an aid to recall. Graphic materials when properly produced can help in attaining all processes in the information processing model of learning as well as serve as avenue for applying principles from other learning theories (Williams, 2004).

b. Three - Dimensional Materials: They are different from charts and graphs which are illustration of two- dimensional materials because of the incorporation of a third element-department. Thus, whereas graphs and charts embrace the width and height of a visualized object, a three-dimensional embraces this third element department, a feature that makes the three- dimensional material a replica of the real thing. Different types of three-dimensional materials exist, namely: Models and mock-ups, realia, specimen, kits and dioramas-which is the creation of a scene in an event (Mkpa, 1987).

c. Still pictures: This refers to flat opaque pictures which we take during festivals or when we are commemorating an event. They also refer to pictures we fined in journals and magazines. They are called still pictures because in admiring them, we hold them in our hands or place them on a surface, which is we do not view them with the aid of projector, as is the case with motion pictures or still projected pictures. Like graphic materials, still pictures belong to the group of two -dimensional materials (Tyler and Ralph,1986).

d. Still projected pictures: Still projected pictures is a class of instructional materials which our learners may not be familiar with. Therefore in order to assist then to better understand what is meant by still projected pictures, is the negative format. Still projected pictures can be projected with a projector. The projector has powerful electronic bulbs, which throw light on to the image on the negative, and image is finally projected on to a screen or wall. Therefore, when dealing with still projected pictures, one is automatically dealing with a whole range of materials (such as slides, overhead transparency, filmstrip etc) whose image are imprinted in

a negative/film and which has to be projected using different types of projector. A major characteristics is still projected pictures is that the images are projected one frame at a time. This is a major difference between still projected pictures and motion pictures. This characteristic enables a still projected picture to stay for as long as a learner wants it on a screen (NAPTEA, 2008).

e. Motion pictures: Motion pictures are distinct from the other types of pictures because of the speed at which they are projected. It is this speed of projection that intact gives the impression of motion. Motion pictures range from the 8 mm standard format to 8 mm supper and finally to the 16 mm format. The width of the film thus constitutes a basic for classifying them. Motion pictures films have sprocket holes along both edges or along only one edge. The presence of sprocket holes facilitates projection. Motion pictures can be projected at 16 or 24fps (frame per second.) They can be silent or accompanied with sound. Sound films use either a magnetic tape or optical sound track for sound recording. If a film is sound, only one edge bears the sprocket holes while the other edge bears the sound components (Gbamanja, 1990).

f. Audio Materials: This is a class name for tape recordings and discs. A disc or record as it is popularly called here is a round and flat acetate containing grooves, which produces sound vibrations through the action of a needled. Discs usually come in different sizes and play at different speeds.

**Importance of instructional Materials:**

a. The essence of producing instructional materials is to facilitate the teaching learning process. The essence is not to use such instructional materials as objects of decoration in our classroom or as objects to be presented during award winning national exhibitions on improved instructional materials. If the essence of producing instructional materials is to use such materials to facilitate teaching learning, it therefore seems logical that the best approach to adopt in any production exercise is to predict out production on research findings on how individuals learn. Besides, there are for instance, many factors that affect attention of human beings. There are also ideas about how we perceive objects. Hence, for a classroom teacher, who wants .to produce instructional materials, his production has to be on sound principles.

b. While presenting various learning theories, one has to be sure that a classroom teacher is guided by expert ideas during his production and utilization of instructional materials.

c. They supply a concrete basis for conceptional thinking and reduce meaningless work responses for pupils as it makes learning more permanent.

d. Instructional materials have a high degree of interest for the learner; for they offer a reality of experience, which stimulates self-activity on the part of pupils.

e. Instructional materials develop a continuity of thought, this is especially true of motion pictures, as they provide experiences not, easily obtained through other materials and contribute to the efficiency, department and variety of learning. Therefore, the use of instructional materials in teaching/learning process exposes the learner to primary experiences and this enriches learning (Okecha 2005).

**Selecting Instructional Materials in Science Curriculum**

Quality instructional materials are essential in teaching about evolution and the nature of science. It is important to consider the context within which specific materials will be used. This chapter therefore begins with brief discussions of school science programs and the criteria used to design curricula (Federal Republic of Nigeria, 1977, 1981, 2004).

Before selecting specific materials to teach evolution and the nature of science, it is important to identify criteria that can help evaluate school science programs and the design of instructional materials. The National Science Education Standards, "Science Education Program Standards," describes the conditions needed for quality school science programs. These conditions focus on six areas:

a. Consistency across all elements of the science program and across the ECE

b. Quality in the program of studies

c. Coordination with mathematics

d. Quality resources

e. Equitable opportunities for achievement

f. Collaboration within the school community to support a quality program

Similarly, educators need to consider criteria against which to judge instructional materials. Teachers, curriculum designers, and other school personnel can use the following criteria to

evaluate the design of a new curriculum, to select instructional materials, or to adapt instructional materials through professional development. No set of instructional materials will meet all the following criteria. You will have to make a judgment about the degree to which materials meet criteria and about acceptable and unacceptable omissions. These criteria are adapted from earlier discussions of standards-based curriculum (Dale, 1957).

**Criterion 1: A Coherent, Consistent, and Coordinated Framework for Science**

Science content should be consistent with national, state, and local standards and benchmarks. Whether for lessons, units, or a complete elementary, middle, or high school program, the content should be well-thought-out, coordinated, and conceptually, procedurally, and coherently organized. The roles of science concepts, inquiry, science in personal and social contexts, and the history and nature of science should be clear and explicit.

**Criterion 2: An Organized and Systematic Approach to Instruction.**

Most contemporary science curricula incorporate an instructional model. The instructional model should a. provide for different forms of interaction among students and between the teachers and students, b. incorporate a variety of teaching strategies, such as inquiry-oriented investigations, cooperative groups, use of technology, and c. allow adequate time and opportunities for students to acquire knowledge, skills, and attitudes.

**Criterion 3: An Integration of Psychological Principles Relative to Cognition, Motivation, Development, and Social Psychology.**

Psychological principles such as those found in the American Psychological Association publication.

Reforming School through Learner-Centered Education should be applied to the framework for content, teaching, and assessment. These psychological principles include more than learning theory. They include providing for motivation, development, and social interactions.

**Criterion 4: Varied Curriculum Emphases**

The idea of curriculum emphases can be expressed by thinking about the foreground and background in a painting. An artist decides what will be in the foreground, and that subject is

emphasized. Science curricula can, for example, emphasize science concepts, inquiry, or the history and nature of science, while other goals may be evident but not emphasized. No one curriculum emphasis is best for all students; probably, a variety of emphases accommodates the interests, strengths, and demands of science content (Egbu, 2012).

**Criterion 5: An Array of Opportunities to Develop Knowledge, Understanding, and Abilities Associated with Different Dimensions of Scientific Literacy**

Contemporary science curricula should provide a balance among the different dimensions of science literacy, which include an understanding of scientific concepts, the ability to engage in inquiry, and a capacity to apply scientific information in making decisions.

**Criterion 6: Teaching Methods and Assessment Strategies Consistent with the Goal of Science Literacy.**

Approaches to teaching and assessment ought to be consistent with the goals of teaching evolution, inquiry, and the history and nature of science. This can be accomplished by using inquiry-oriented teaching methods and by assessing students during investigative activities.

**Criterion 7: Professional Development for Science Teachers Who Implement the Curriculum.**

Curricula need to provide opportunities that support teachers as they develop the knowledge and skills associated with implementing and institutionalizing the science program.

**Criterion 8: An Inclusion of Appropriate Educational Technologies**

The use of computers and various types of software enhances learning when students use the technologies in meaningful ways. The use of educational technologies should be consistent with other features of the curriculum-for instance, the dimensions of scientific literacy and an instructional model.

**Criterion 9: Thorough Field Testing and Review for Scientific Accuracy and Pedagogic Quality.**

One important legacy of the 1960s curriculum reform is the field testing of materials in a variety of science classrooms. Field testing and reviewing a program identify problems that developers did not recognize and fine tune the materials to the varied needs of teachers,

learners, and schools. Scientists should review materials for accuracy. Fredrich (1957) opined that developers can miss the subtleties of scientific concepts, inquiry, and design. In addition, educators who review materials can provide valuable insights about teaching and assessment that help developers improve materials and enhance learning (Froese, 1972).

**Criterion 10: Support from the Educational System**.

Research on the adoption, implementation, and change associated with curricula indicates the importance of intellectual, financial, and moral support from those within the larger educational system.4 This support includes science teachers, administrators, school boards, and communities. Although a curriculum cannot ensure support, it should address the need for support and provide indicators of support, such as provision of materials and equipment for laboratory investigations, budget allocations for professional development, and proclamations by the school board (Gur-ze'ev, 2005).

Clearly, no one curriculum thoroughly incorporates all ten criteria. There are always trade-offs when developing, adapting, or adopting a science curriculum. However, the criteria should provide assistance to those who have the responsibility of improving the science curriculum (Eze, 1995).

**Analyzing Instructional Materials**

The process of selecting quality materials includes determining the degree to which they are consistent with the goals, principles, and criteria developed in the National Science Education Standards. Well-defined selection criteria help ensure a thoughtful and effective process. To be both usable and defensible, the selection criteria must be few in number and embody the critical tenets of accurate science content, effective teaching strategies, and appropriate assessment techniques (Federal Ministry of Education and Youth Development, 1993).

The extent to which instructional materials meet the criteria outlined in this chapter determines their usefulness for classroom teachers and the degree of alignment with the Standards. A thorough analysis of instructional materials requires considerable time and collaboration with others and attention to detail. Good working notes are helpful in this process.

**Overview of Instructional Materials**

The following overview of instructional materials introduces the review process and provides a general context for analysis and subsequent selection of specific materials. Oboro Asaya and Ehigie (1999) asserted that the first consideration is whether the key concepts of evolution and the nature of science are being emphasized. To help make this determination, locate the table of contents, index, and glossary in the material you are evaluating. The box below contains terms related to fundamental concepts in evolution and the nature of science taken from the Standards. Record page numbers where each is found for future reference. These terms will give you a preliminary indication of coverage on these fundamental topics.

**CONCLUSION AND RECOMMENDATIONS:**

Conclusively, in order to use instructional materials and aid more effectively, therefore suggest the following guidelines:

a. Instructional materials must make learning more real and meaningful to the learner.

b. The materials should not be substitute for learning but must contribute to the learning process itself.

c. It is suggested that the time spent on the use of instructional materials to facilitate learning should commensurate with the lesion period, allowed. Instructional materials should be useable and not so ' complex that the time is spent on just learning to use them (instructional materials).

d. Instructional materials to be used must make learning more real and meaningful to the learner.

e. And finally, the use of several kinds of instructional materials to explain one particular concept must also take cognizance of individual difference among the learners.

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