

**Presentation Title- Structure of Mathematics Textbook: Implications for Humanized Teaching.**

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**Outline of Presentation**

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## **Objectives of the Study**

The objectives of this study are to: evaluate recommended mathematics textbooks used in senior secondary schools if these texts are structured for humanized teaching of Geometry other texts not recommended but are structured for humanized teaching.

## **Mathematics and its Role**

Mathematics is the study of number forms, the arrangement, association and relationship of numbers using defined and operational symbols.

Mathematics enables measurements in scientific and technological operations as well as in commerce.

Mathematics as the bedrock of science and technology leads a functional role which is multifaceted and multifarious. Ale & Adetola (2009) highlighted the chain of linkages between mathematics, science; technology and modern society which is composed of many fields of human endeavor to chain includes management, economics, governments, computerization, physics, psychology, engineering and the social sciences which are sewn together by measurement and vital transactions of daily life. Omoifo (2012) described such simple yet vital transactions of daily life such as telling time, gauging distances etc. as mathematical.

To ensure that tomorrow's leaders are equipped to compete in our global economy, they should be able to make connection between mathematics and everyday life.

## **What is Humanized Teaching?**

Mathematical Instruction that is activity-based emphasizing the process instead of the product - thereby making mathematics Learning interesting and develops in the learner self confidence in doing mathematics. Humanized mathematics teaching adds the human element to teaching which helps the learner to make connections between mathematics and everyday life. Humanized teaching talks about people, places and processes- that is revealing the procedures that led to the final result.

## **Textbook Structure and Humanized Teaching**

The New Webster's Dictionary of the English Language (1997) International edition defines structure as the essential supporting portion, the framework in which constituents parts are fitted or joined together or arranged to form a whole. The textbook is the teaching material that presents the subject matter as defined by the curriculum with the aim of achieving the objectives of teaching.

A good textbook structure should encourage knowledge of the facts, understanding of the facts, and the application of wisdom to the facts, Jacobs (2004). The presentation of the content should combine the teaching of the knowledge of principles with an understanding of how these principles work. To encourage this, exercises should be introduced.

The structure of the text should reflect on the marvelous "unity and diversity" in mathematics thereby applying the content to other subjects be it the arts, science or social sciences. The text should incrementally builds the mathematical repertoire of the students through rigorous and challenging exercises. An indices of a good textbook is that the teaching approach should be delightful employing review of previously learned skills.

The good textbook structure should exhibit highest levels of instructional narration throughout its text, Keffe and O'Donoghue (2011). In evaluating the structure of mathematics textbooks research evidence has revealed that the textbook should include additional information which should be clearly separated from compulsory information and offers different ways to approach the content, Johanson (2003). The text should convey technical information corresponding to other subjects and should be related to humans and reality.

## **Research Procedures**

The design for this study is survey design.

The instrument for data collection is a questionnaire titled IESMT (Instrument for Evaluating the Structure of Mathematics Textbooks) in Nigerian Secondary Schools for Humanized Teaching.

It is made up to two sections. Section A is on Biodata of the assessors and section B is on evaluative attributes of recommended textbooks for humanized teaching which is broken down into nine attributes. These are:

History - four (4) items; Statement of Objective –five (5) items; Content / Presentation-seven (7) items; Application of Geometry to Human Activities-six (6) items; Application of Geometry as it relates to Other School subjects-three (3) items; Problem Solving Skill Developed through Instructional Task-eleven (11) items; Teachers Support six (6) items ;Instructional Materials five (5) items and Assessment Materials- five (5) items.

The population for this study consists of randomly selected SSS11 Mathematics teachers from the total of 80 public schools and 121 private schools in Egor, Ikpoba- Okha, Oredo and Ovia-Northeast Local Government Areas of Edo state, Nigeria.

Using systematic sampling technique, 57 teachers were selected from the total number of five hundred and seventy teachers (570) of the two hundred and one (201) schools.

The Assessors responded based on the mathematics textbooks they have used. Data collected were analyzed using descriptive statistics.

## **Research Questions**

Ten research questions were raised to direct the study. The research questions focused on examination of the extent to which the textbooks possessed humanized teaching attributes.

These attributes are:

History; Statement of Objectives; Content Presentation; Application of Geometry to Human Activities; Application of Geometry to other School Subjects; Problem Solving Skill Developed through Instructional Task; Teachers' Support ;Instructional Materials; Assessment Materials.

The Instrument also examined teachers preferred textbook not recommended but preferred for its humanized nature.

### Results

History (Emphasizing origin, people, places)	Statement of Objectives (Practical, attainable and aligned)	Content Presentation (Logical, interwoven across strands)	Application of Geometry to Human Activities	Application of Geometry as it relates to Other Subjects	Developing Problem Solving Skills	Teacher's Support	Instructional Materials	Assessment Materials
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STAN Math	Essential Math	Essential Math	Essential Math	NONE	NONE	Essential Math	Essential Math	Essential Math
	College Certificate Math	College Certificate Math	College Certificate Math			College Certificate Math	College Certificate Math	College Certificate Math
	Comprehensive Math	Comprehensive Math	Comprehensive Math			Comprehensive Math	Comprehensive Math	Comprehensive Math
	MAN Math	MAN Math	MAN Math			MAN Math	MAN Math	MAN Math
	New General Math	New General Math	New General Math			New General Math	New General Math	New General Math
	New Concept Math	New Concept Math	New Concept Math			New Concept Math	New Concept Math	New Concept Math
	New School Math	New School Math	New School Math			New School Math	New School Math	New School Math
	STAN Math	STAN Math	STAN Math			STAN Math	STAN Math	STAN Math

From the results analyzed, *none* of the textbooks in use satisfied all the conditions.

## **Implications**

- The texts that lacks evidence of history can neither enhance learners' love for mathematics nor improve their perception of mathematics.
- The texts cannot teach the connection that exists between mathematics and other school subjects.
- The texts cannot develop learners' problem solving skills which is the foundation of mathematical process.

## **Conclusion**

-None of the texts have all the nine attributes of a humanized text. -Seven are lacking in history, none relates geometry to other school subjects nor emphasize development of problem solving skills.  
-All the text needs reversion in these three areas except for STAN mathematics that is only concerned in two areas.  
-Some teachers indicated preference for some texts not recommended but the percentage number of teachers is too small to be significant.