

About The Book

Long before the advent of publishing, the people of Nigeria are known to openly display their rich cultures and traditions. Embedded in this expressive culture are tangible evidence of mathematical elements in the form of geometric shapes, numbers, counting systems and exotic patterns. Ancient Nigerian peoples and cultures devised numbering systems, counted objects, constructed homes, and designed works of art based on mathematical principles that are presently taught in schools under different names. Still, many indigenous perspectives in mathematics are fading into oblivion, further mystifying the subject. This book uses the scoping review framework to showcase early revolutionary reactions to the suppression of information on the development of indigenous mathematics in Nigeria. It traces ample scholarly evidence of Nigerians' skills in the use of numbers and other elements of mathematics long before the arrival of the White Men. This work is intended to serve as a bridge to our noble mathematical past as preserved by great thinkers from diverse fields, locations and cultures. It sought to beam the searchlight on what we are missing as modern academic societies when we turn our back on rich instructional aids hidden in the cultural practices of our people.

About The Author



Joshua Abah ABAH is a researcher in the Department of Mathematics Education, Federal University of Agriculture, Makurdi, Nigeria. His research interests are Technology of Mathematics Education, Ethnomathematics, Statistical Computing, and Instructional Design. He is happily married to Christy and the marriage is blessed with two children, Prime and Hephzibah.



ISBN:

REVISITING THE MATHEMATICS OF OUR ANCESTORS

Joshua Abah ABAH

REVISITING THE MATHEMATICS OF OUR ANCESTORS

*A Scoping Review of Early Scholarly Works
on the Mathematical Systems of Nigerian
Peoples and Cultures*



Joshua Abah ABAH

REVISITING THE MATHEMATICS OF OUR ANCESTORS

*A Scoping Review of Early Scholarly Works
on the Mathematical Systems of Nigerian
Peoples and Cultures*

Joshua Abah ABAH



**Network for Grassroots Science and Mathematics Education
(The VillageMath Network)
<https://ngsme.villagemath.net>**



REVISITING THE MATHEMATICS OF OUR ANCESTORS

**A SCOPING REVIEW OF EARLY SCHOLARLY
WORKS ON THE MATHEMATICAL SYSTEMS OF
NIGERIAN PEOPLES AND CULTURES**

Joshua Abah ABAH

Copyright © 2020 Joshua Abah ABAH
Network for Grassroots Science and Mathematics Education
(The VillageMath Network)
Department of Mathematics Education
Federal University of Agriculture, Makurdi, NIGERIA

PREFACE

This book bears a catchy name. But the title is apt in drawing attention to the benefits accruable from *Ethnomathematics* as a paradigm in Mathematics Education. Ethnomathematics requires a dynamic interpretation because it describes concepts that are themselves neither rigid nor singular, namely “ethno” and “mathematics”. The term “ethno” describes all of the ingredients that make up the cultural identity of a group: language, codes, values, jargon, beliefs, food and dress, habits, and physical traits. Mathematics expresses a broad view of mathematics which includes ciphering, arithmetic, classifying, ordering, inferring and modeling. Many educators may be unfamiliar with the term, yet a basic understating of it allows teachers to expand their mathematical perceptions and more effectively instruct their students.

Teachers and the public in general do not commonly say that Mathematics and culture are connected. When teachers do acknowledge a connection, often they engage their students in multicultural activities merely as a curiosity. Such activities usually refer to a culture’s past and to cultures that are very remote from that of the children in the class. This situation occurs because teachers may not understand how culture relates to children and their learning. An important component of Mathematics education today should be to reaffirm, and in some instances to restore, the cultural dignity of children.

Although multicultural Mathematics activities are important, they should not be our final goal. As students experience multicultural mathematical activities that reflect the knowledge and behaviours of people from diverse cultural environments, they not only may learn to value the Mathematics but, just as important, may develop a greater respect for those who are different from themselves.

To acquire requisite skills while maintaining cultural dignity and to be prepared for full participation in society require more than what is offered in the traditional mathematics curriculum. Much of today's curriculum is so disconnected from the child's reality that it is impossible for the child to be a full participant in such reality. The Mathematics in many classrooms has practically nothing to do with the world that the children are experiencing. Just as literacy has come to mean much more than reading and writing, Mathematics must also be thought of as more than, and indeed different from, counting, calculating, sorting, or comparing. Considering that today's children are living in a civilization that is dominated by mathematically-based technology and unprecedented means of communication, it is safe to assert that much of the content of current Mathematics programmes does little to help students learn the information and skills necessary to function successfully in this new world.

The goal of Mathematics Education should be to foster students' ability to successfully use modern technology to solve problems and communicate their thinking and answers as they

gain an awareness of the capabilities and limitations of technological instruments. The school system can help students realize their full mathematical potential by acknowledging the importance of culture to the identity of the child and how culture affects the way children think and learn. Children must be taught to value diversity in the mathematics classroom and to understand both the influence that culture has on Mathematics and how this influence results in different ways in which mathematics is used and communicated. Such an understanding is gained through the study of ethnomathematics.

Ethnomathematics as a programme studies the cultural aspects of Mathematics. It acknowledges that there are different ways of doing Mathematics by considering the appropriation of academic mathematical knowledge developed by different sectors of the society as well as by considering different modes in which different cultures negotiate their mathematical practices. Ethnomathematics researchers investigate ways in which different cultural groups comprehend, articulate and apply ideas, procedures, and techniques identified as mathematical practices. These mathematical practices refer to forms of Mathematics that vary as they are embedded in cultural activities. Ethnomathematics presents the mathematical concepts of the school curriculum in a way in which these concepts are related to the cultural backgrounds of students, thereby enhancing their ability to make meaningful connections and deepening their understanding of Mathematics.

Culture is a learned behaviour consisting of thoughts, feelings and actions and is transferred in social interaction. Within every culture, there exists indigenous knowledge which encompasses the complex, intergenerational and cumulative experiences and teachings of the indigenous peoples. However, many contemporary educational researchers agree that there is a discontinuity between the home or community culture of students and the education they receive in mainstream schools. The lack of relevance of school Mathematics to the learners' everyday life and culture suggests that there is need to incorporate into the mathematics curriculum such cultural practices, ideas and beliefs that would connect the school to the community in which it exists and functions. Educators, academics and policy makers have called for more research that addresses gaps in understanding of culture-based Mathematics Education.

Culture-based Mathematics Education is teaching and learning of Mathematics that takes into consideration the context of the learners, blending academic and vocational competencies. Contextualization is based on the proposition that people learn more effectively when they are learning about something that they are interested in, that they already know something about, and that afford them the opportunity to use what they already know to figure new things out. The use of locally relevant contexts-situations and phenomena that have local and personal meaning to students and teachers for whom a curricular product is designed, provides access to educational

and social participation and opportunity at multiple levels of practice. In other words, Culture-based Mathematics Education, in addition to attending to academic goals, must take seriously the ways students' experiences are structured by policies, institutions and societal practices and work with students to confront them.

This work, *Revisiting the Mathematics of our Ancestors*, is a response to the call for more enlightenment on the pre-historic mathematical practices of the ancient peoples of Nigeria. The book intends to clarify that pre-colonial Nigeria is not at all "primitive" as many history books would want us to believe. The use of such terms as "primitive" would be considered as derogatory in the light of the remarkable scholarly evidence gathered in this work. The considerations in this book should ultimately provide a solid footing for researchers of Nigeria's Ethnomathematics and encourage classroom practices that imbibe culture-based Mathematics Education.

Joshua Abah ABAH
2020

TABLE OF CONTENT

Title Page	i
Copyright Page	iii
Preface	iv

CHAPTER ONE

Ethnomathematics in a Digital World	1
Introduction	1
Digitizing our Cultural Heritage	4

CHAPTER TWO

Overview of Scoping Review	13
Introduction	13
Typology of Literature Review	15
What is Scoping Review?	25
Process of Scoping Review	32
Format of Scoping Review	37

CHAPTER THREE

Methodology	42
Introduction	42
Title	42
Review Question	42
Review Objective	43
Review Protocol	43

CHAPTER FOUR

1800-1919	48
1886: Notes on the Numeral System of the Yoruba Nation (Adolphus Mann)	48

CHAPTER FIVE

1920 - 1969 -- -- -- -- -- -- -- -- -- -- -- 53
1920: Duodecimal Base of Numeration (N.W. Thomas) -- 53
1962: Yoruba Numerals (Robert G. Armstrong) -- -- 59

CHAPTER SIX

1970 -1979 -- -- -- -- -- -- -- -- -- -- -- 63
1970: Mathematics of the Yoruba People and of thier
Neighbors in Sourthern Nigeria (Claudia Zaslavsky) -- -- 63
1973: Africa Counts: Number and Pattern in
African Cultures (Claudia Zaslavsky) -- -- -- -- -- 78
1975: The Geometry of African Art: Catalog of Benin
Patterns (Donald W. Crowe) -- -- -- -- -- -- -- 84
1978: Change in Mathematics Education since the late
1950's - Ideas and Realization (R. Ogbonna Ohuche)-- -- 101

CHAPTER SEVEN

1980-1989 -- -- -- -- -- -- -- -- -- -- -- 103
1984: The Sorry State of Mathematics Education in Nigeria
(Peter N. Lassa) -- -- -- -- -- -- -- -- -- -- -- 103
1984: Integrating Traditional Games and Play Activities into
Primary Science Education Programmes (Eunice A. Okeke)-- 104
1988: Historical and Ethnomathematical Algorithms for
Classroom use (Lawrence Shirley) -- -- -- -- -- -- -- 110
1989: Mathematics in Rural Societies (Sam O. Ale) -- -- 112

CHAPTER EIGHT

1990 - 1999 -- -- -- -- -- -- -- -- -- -- -- 119
1995: The Combinatorics of Mancala-type Games: Ayo,
Tchoukaillon, and 1/[] (Duane M. Broline and Daniel E. Loeb)-- 119
1997: The African Heritage of Benjamin Banneker
(Ron Englash) -- -- -- -- -- -- -- -- -- -- -- 124

CHAPTER NINE

2000 And Afterwards -- -- -- -- -- -- -- -- 130
2001: Science and an African Logic (Helen Verran) -- -- 130

CHAPTER TEN

Conclusion -- -- -- -- -- -- -- -- -- -- 134
References -- -- -- -- -- -- -- -- -- -- 137

HOW TO OBTAIN THIS BOOK

A COPY OF THIS BOOK COST ₦3000.00 ONLY. This price does not include handling and shipping charges. Shipping can be arranged during book request.

You can request a copy of this book through the following channels:

Email: editor.villagemath@gmail.com ; info@villagemath.net ; ngsme@villagemath.net

SMS: +2348073695770 ; +2348179456590

WhatsApp: +2347039240534

Telegram: +2347039240534

For further Information please visit <https://villagemath.net>