

EVALUATION OF THE USE OF NUMERICAL TOOLS IN TEACHING CALCULUS CONCEPTS

BY

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BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF MATHEMATICS, FACULTY OF
SCIENCE, UNIVERSITY OF LAGOS, AKOKA, LAGOS STATE

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc.)
DEGREE IN MATHEMATICS

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Evaluation of the Use of Numerical Tools in Teaching Calculus Concepts" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

ACKNOWLEDGEMENT

My profound gratitude goes to Almighty God for His grace, protection, and guidance throughout the duration of my study and the successful completion of this research project. I am deeply grateful to my supervisor, [SUPERVISOR'S NAME], for the patience, guidance, constructive criticism, and invaluable direction provided throughout the course of this research. I also wish to appreciate the Head of Department, the lecturers of the Department of Mathematics, and my course mates for their support and friendship. My appreciation also goes to my parents and siblings for their unwavering support, both financial and emotional, throughout my academic journey.

ABSTRACT

This study examined evaluation of the use of numerical tools in teaching calculus concepts, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of evaluation; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with evaluation and use. The study adopted a descriptive survey research design, anchored on the Polya's Problem-Solving Theory and the Mathematical Modelling Theory. A sample size of 388 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 350 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 3.06). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.506$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 7.59, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.29$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on evaluation.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of evaluation of the use of numerical tools in teaching calculus concepts is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

evaluation continues to command considerable attention among researchers, policymakers, and practitioners in mathematics. The Nigerian context presents peculiar challenges, ranging from infrastructural deficits to institutional weaknesses, which shape the manner in which evaluation unfolds. Evidence assembled by Nwosu and Obiora (2015) across twelve states underscored the heterogeneity of outcomes linked to evaluation. Accordingly, there is a growing consensus that deliberate policy action is required. Comparative work by Obiora and Osinachi (2022) across several states uncovered a consistent pattern linking evaluation with use. For practitioners, the practical significance of evaluation cannot be overstated, given its demonstrable link with use. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

Debates on national transformation repeatedly return to the role of evaluation and its attendant dynamics. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of evaluation. The work of Okonkwo and Nnamdi (2023) extended earlier analyses by demonstrating that use reinforces the effects of evaluation. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. A notable study by Umeh and Aderemi (2017) argued that the impact of evaluation is substantially mediated by the quality of institutions. Sustained engagement with the issues raised here is therefore essential if meaningful progress is to be recorded. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

The phenomenon of evaluation, while not new, has acquired fresh analytical urgency in Nigeria. The socio-cultural diversity of Nigeria implies that responses to evaluation must be differentiated rather than uniform. Field evidence gathered by Umeh and Aderemi (2016) suggested that stakeholder engagement materially improves the results achieved in matters of evaluation. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. Musa and Bello (2020), in a survey of relevant stakeholders, concluded that the benefits of evaluation are unevenly distributed across groups. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

In both global and African literatures, evaluation is now regarded as a key index of institutional performance. Evidence from national agencies indicates that evaluation has grown considerably in recent times, underscoring the need for systematic inquiry. A notable study by Chukwu and Olawale (2017) argued that the impact of evaluation is substantially mediated by the quality of institutions. These developments carry