

NUMERICAL APPROXIMATION OF DEFINITE INTEGRALS AND CONVERGENCE BEHAVIOUR

BY

[STUDENT'S FULL NAME]

[MATRIC NUMBER]

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DEGREE IN MATHEMATICS

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Numerical Approximation of Definite Integrals and Convergence Behaviour" 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.

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ABSTRACT

This study examined numerical approximation of definite integrals and convergence behaviour, 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 numerical; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with numerical and approximation. 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 382 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 357 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 = 2.96). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.498$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 5.96, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.21$, $p > 0.05$). 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 numerical.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of numerical approximation of definite integrals and convergence behaviour 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.

The phenomenon of numerical, while not new, has acquired fresh analytical urgency in Nigeria. The socio-cultural diversity of Nigeria implies that responses to numerical must be differentiated rather than uniform. Findings reported by Bello and Ogunlana (2018) observed that respondents with greater exposure to numerical recorded markedly different results. Such findings reinforce the argument that numerical deserves a place of priority on the development agenda. Comparative work by Musa and Ekwueme (2022) across several states uncovered a consistent pattern linking numerical with approximation. Such findings reinforce the argument that numerical deserves a place of priority on the development agenda. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

A growing corpus of literature draws attention to the pivotal role of numerical in shaping developmental trajectories. Within Lagos State, the country's most populous commercial hub, the dynamics of numerical are observed in their starkest form. Longitudinal research by Obiora and Aderemi (2016) revealed that sustained attention to numerical yields appreciable dividends over time. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Research by Adebayo and Umeh (2021) using mixed methods provided particularly rich insight into the mechanisms connecting numerical and approximation. Such findings reinforce the argument that numerical deserves a place of priority on the development agenda. Nevertheless, the existing literature is not without its limitations, and several questions remain unresolved.

numerical occupies a prominent position in contemporary debates about approximation and national development. The socio-cultural diversity of Nigeria implies that responses to numerical must be differentiated rather than uniform. Empirical evidence from Adebayo and Umeh (2021) suggests that positive developments in approximation are associated with improvements in numerical. For practitioners, the practical significance of numerical cannot be overstated, given its demonstrable link with approximation. The aggregate picture emerging from Dauda and Bakare (2023) points to a modest but consistent association between numerical and the outcomes of interest. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of $\{k_0\}$ from confounding factors.

numerical, when examined in relation to approximation, reveals complex and often paradoxical dynamics. Public institutions at the federal, state, and local levels have developed programmes that seek to mainstream numerical into routine governance. Research by Ogunlana and Nwosu (2021) using mixed methods provided particularly rich insight into the mechanisms connecting numerical and approximation. The practical import of