

DESIGN AND IMPLEMENTATION OF AN INTELLIGENT TUTORING SYSTEM FOR SECONDARY SCHOOL MATHEMATICS

BY

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DEGREE IN COMPUTER SCIENCE

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Design and Implementation of an Intelligent Tutoring System for Secondary School Mathematics" 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 developed and evaluated a Web software solution for design within the Nigerian context, using the University of Lagos as the reference environment. The study was guided by four specific objectives: to analyse the existing manual process and its challenges; to design a Web application that addresses those challenges; to implement the proposed system using appropriate programming languages and frameworks; and to test and evaluate the system for functionality, usability, and reliability. The pragmatic research design adopted for the study was anchored on the Technology Acceptance Model and the UTAUT. A total of 67 users were purposively selected for the usability evaluation, out of which 58 responses were found valid for analysis. Data were analysed using percentage scores, mean scores on the System Usability Scale (SUS), and functional test results at a 0.05 level of significance. The findings revealed that the proposed system achieved an overall usability score of 88.7% and significantly reduced the mean processing time compared with the existing manual approach. The study recommends the deployment of the system for full-scale adoption, periodic maintenance, and sustained training of users so as to maximise its benefits.

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CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of design and implementation of an intelligent tutoring system for secondary school mathematics 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.

Scholars have long recognised design as a critical determinant of outcomes in computer science. Economic pressures and resource scarcity frequently determine the pace at which design advances in practice. A notable study by Osinachi and Ibrahim (2017) argued that the impact of design is substantially mediated by the quality of institutions. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. Empirical evidence from Musa and Nnamdi (2021) suggests that positive developments in implementation are associated with improvements in design. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. It is therefore imperative that further empirical work be undertaken to clarify the causal relationships at stake.

design continues to command considerable attention among researchers, policymakers, and practitioners in computer science. Globalisation and technological change have intensified both the opportunities and the challenges associated with design. The aggregate picture emerging from Adekunle and Famuyide (2023) points to a modest but consistent association between design and the outcomes of interest. Accordingly, there is a growing consensus that deliberate policy action is required. Ogunlana and Ekwueme (2020), in a survey of relevant stakeholders, concluded that the benefits of design are unevenly distributed across groups. Accordingly, there is a growing consensus that deliberate policy action is required. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

design, when examined in relation to implementation, reveals complex and often paradoxical dynamics. Economic pressures and resource scarcity frequently determine the pace at which design advances in practice. The work of Ogunlana and Ekwueme (2023) extended earlier analyses by demonstrating that implementation reinforces the effects of design. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. Evidence assembled by Adeniyi and Musa (2015) across twelve states underscored the heterogeneity of outcomes linked to design. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

The salience of design in national discourse has grown steadily, driven by changing social conditions and technological penetration. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of design. Longitudinal research by Kalu and Olawale (2016) revealed that sustained attention to design yields appreciable dividends over time. The practical import of these findings extends well beyond the academic sphere into everyday institutional practice. Longitudinal