PONTE

Vol. 80 No. 1, 2024 Florence, Italy
ISSN: 0032-423X *E-ISSN:*0032-6356 International Journal of Sciences and Research

DOI: https://doi.org/10.5281/zenodo.14829851

BLENDED TEACHING METHODS IN MATHEMATICS EDUCATION: A THEORETICAL FRAMEWORK INTEGRATION AND IMPLEMENTATION STRATEGY FOR SOUTH AFRICAN HIGH SCHOOLS

Joseph Baidoo
Mathematics, Science and Technology Department
Walter Sisulu University
Komani Campus

ABSTRACT

This theoretical study examines the implementation of blended teaching methodologies in mathematics education within the South African high school context, focusing on integrating traditional and digital pedagogies. Through a systematic theory synthesis design, the research develops a comprehensive conceptual framework that bridges the gap between contemporary educational theories and practical implementation strategies. The study integrates the Community of Inquiry (CoI) framework with the Technological Pedagogical Content Knowledge (TPACK) model to create a robust theoretical foundation for understanding blended mathematics instruction. Findings reveal that this integrated framework demonstrates remarkable adaptability across South Africa's varied educational landscapes while effectively incorporating emerging technologies such as AI-powered tutoring systems and adaptive learning platforms. The research contributes significantly to the field by providing practical guidelines for implementing blended learning methodologies that promote procedural and conceptual mathematical understanding. Furthermore, the study addresses the unique challenges and opportunities within South Africa, offering evidence-based recommendations for educators and policymakers. This theoretical framework establishes a foundation for future research and practice in mathematics education, particularly in contexts where educational transformation is essential for addressing historical inequities and preparing students for an increasingly digital future.

Keywords: Blended Learning, TPACK Framework, Community of Inquiry, South African Education, Digital Pedagogical Integration.