ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Issues– III (Special Issue – I) May – June, 2025

OPEN ACCESS Original Research Article

ENHANCING MATHEMATICS ACHIEVEMENT THROUGH PROCEDURAL FLUENCY AND STUDENT-CENTERED APPROACHES: A CASE STUDY OF 11G STUDENTS

*** Jabeen Ibrahim Ansari**

** Mathematics Teacher, Ministry of Education UAE*

Abstract:

I have conducted action research that explores the notable improvement in mathematics performance among Grade 11G students, a class of 14 learners, following the implementation of specific pedagogical strategies during Term 1. The approach centered around open teacher-student communication, mutual expectation setting, procedural fluency, and student-centered instruction. The research began with a positive discussion on the first day of class about classroom norms and mutual responsibilities. This dialogue laid the foundation for a respectful and productive learning environment. Emphasis was placed on slowing down instruction, revisiting concepts regularly, inclusion of educational platforms like LMS, ALEF, DESMOS, MS TEAMS and khan academy and focusing on procedural mathematics to build fluency and accuracy. These efforts significantly enhanced students' problem-solving abilities and resulted in higher scores, especially in the writing section of the term-end exam.

Although 10 students demonstrated remarkable academic growth, 4 students did not pass, indicating a need for differentiated and targeted support strategies. This report discusses interventions already implemented and outlines future steps such as diagnostic assessments, remedial teaching, peer tutoring, and increased parental involvement. The aim is to ensure that all students, regardless of ability level, experience academic success. The findings underscore the value of responsive teaching and collaborative learning environments in improving student performance in mathematics.

Introduction:

Mathematics is a subject that many students find challenging due to its abstract nature and cumulative learning structure. In Grade 11G, consisting of 14 students, a focused and collaborative effort was undertaken during Term 1 to support student learning through modified instructional strategies. The initial spark for this research came from the notable improvement observed in the majority of students' performance, along with encouraging feedback from parents. As a mathematics teacher, I found this change deeply satisfying and worth exploring through systematic action research.

Purpose of the Study:

This research aims to analyze the effectiveness of student-centered and procedural teaching methods in improving student outcomes in mathematics. It also seeks to identify strategies to support the four students who did not pass, with a long-term goal of enabling academic success for all learners.

Objectives:

- To evaluate the impact of a respectful and communicative classroom culture on student learning.
- To assess the effect of teaching procedural mathematics with a slow-paced, repetitive approach sing the digital platforms for spontaneous feedbacks.
- To develop a plan of action to support struggling learners and ensure inclusive academic progress.

Methodology:

Participants: 14 students of Grade 11G.

ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Issues– III (Special Issue – I) May – June, 2025

OPEN ACCESS Original Research Article

Duration: One academic term (3 months).

Research Tools and Techniques: Formative and summative assessments, informal feedback from students and parents, teacher observations, reflective journaling, and end-of-term exam results.

Initial Classroom Strategy: The term began with a healthy dialogue with students to co-create classroom norms—'Dos and Don'ts'—for both the teacher and students. This was done to foster mutual trust, accountability, and open communication.

Interventions Applied:

a. Emphasis on Procedural Mathematics: To strengthen mathematical fluency, the focus was on step-by-step problem-solving, applying consistent procedures to different types of problems.
b. Adjusted Teaching Pace and Repetition: Concepts were taught slowly and revisited regularly.
c. Focused Review and Practice Sessions: Used class time for solving past papers and exercises.
d. Individual Support and Encouragement: Regular feedback and recognition were provided using ALEF and LMS platforms.
e. Parental Involvement: Parents were updated regularly to reinforce motivation at home also a formal biweekly descriptive reports were send to parents.

Results and Observations:

Successes:

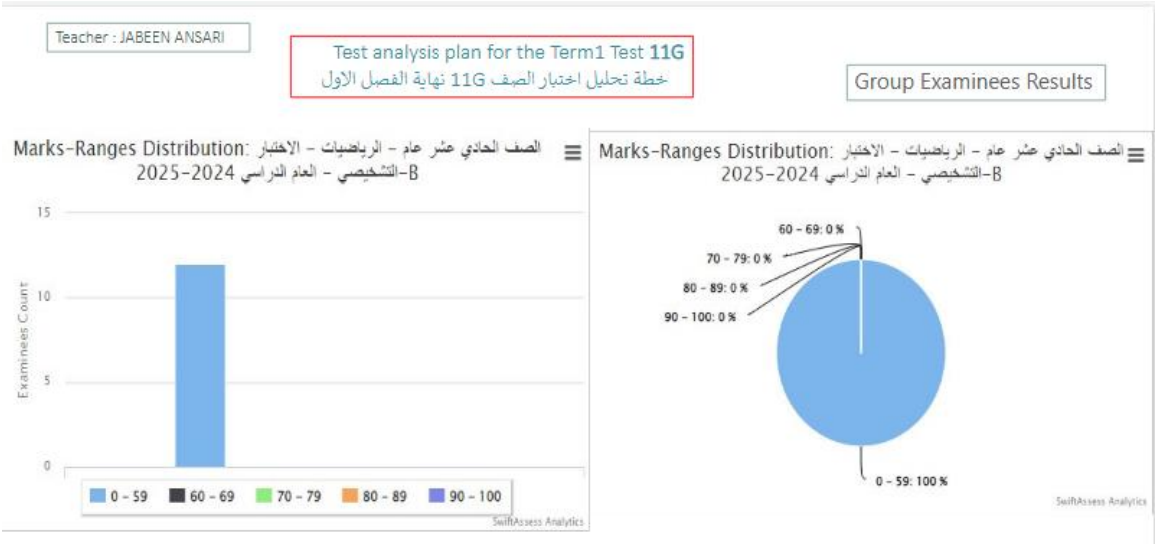
- 10 out of 14 students showed remarkable improvement, especially in written assessments.
- Improved procedural clarity and confidence were noted.

Challenges:

- 4 students failed the term-end exam and need targeted intervention.

Analysis of Student Improvement:

- A comparison between baseline assessments and term-end results showed:
- 15–25% average improvement among 10 successful students.
- Greater success among those embracing repetition and peer interaction.
- Peer support contributed positively to comprehension.

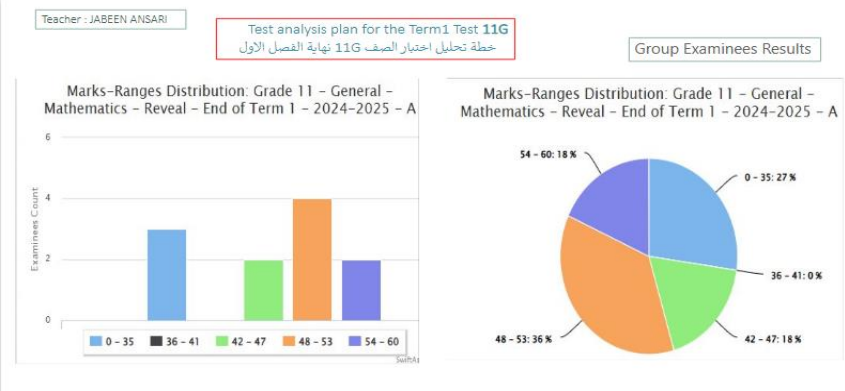


ISSN–2278-5655

AMIERJ Aarhat Multidisciplinary International Education Research Journal

Volume–XIV, Issues– III (Special Issue – I) May – June, 2025

OPEN ACCESS Original Research Article



Strategies for Supporting Struggling Learners:

a. Diagnostic Assessments: To identify weak areas.
b. Remedial Classes: Weekly sessions for revisiting foundations.
c. Peer Tutoring: Paired with stronger students.
d. Visual and Kinesthetic Learning: Use of aids and manipulatives.
e. Gamified Tools: Use of apps and platforms for practice.
f. Parental Collaboration: Ensure home study support.
g. Positive Reinforcement and Counseling: Motivate and support students emotionally by one to one meeting.

Steps Ahead for Overall Progress:

- Maintain open student communication.
- Plan differentiated lessons.
- Introduce enrichment activities sing digital platforms.
- Use real-life problems.
- Conduct weekly micro-assessments.
- Celebrate all achievements to boost morale by reward system.

Reflection:

This research has reaffirmed the power of student voice and respectful dialogue. While four students still need additional support, the overall improvement encourages continuation and refinement of these strategies.

Conclusion: The interventions used in Grade 11G have demonstrated success through a combination of procedural fluency and responsive teaching. By extending efforts to the struggling students, the class can achieve collective success in mathematics.

Acknowledgment: Thanks to all students, parents, and the school leadership for their cooperation and encouragement throughout this journey.

References:

1. *Boaler, J. (2016). Mathematical Mindsets: Unleashing Students' Potential through Creative Math, Inspiring Messages and Innovative Teaching. Jossey-Bass.*
2. *National Council of Teachers of Mathematics (NCTM). (2000). Principles and Standards for School Mathematics.*
3. *Marzano, R. J. (2003). What Works in Schools: Translating Research into Action. ASCD.*
4. *Tomlinson, C. A. (2014). The Differentiated Classroom: Responding to the Needs of All Learners. ASCD.*
5. *Wiliam, D. (2011). Embedded Formative Assessment. Solution Tree Press.*

Cite This Article: ***Ansari J.I. (2025).*** *Enhancing Mathematics Achievement through Procedural Fluency and Student-Centered Approaches: A Case Study of 11G Students*. **In Aarhat Multidisciplinary International Education Research Journal**: **Vol. XIV (Number III, pp. 83–85).**