



DEPARTMENT:

FACULTY SPONSOR:

STUDENT(S):

PROJECT TITLE:

Incorporating Movement into Mathematics Instruction

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Introduction

In America today the mostly widely used instruction method is direct lecture and has been so since universities were first founded [2]. However, lecture alone may not be the most effective teaching method. Evidence shows that incorporating movement into everyday instruction improves student learning and classroom dynamics. In this project we look at different pedagogical techniques that utilize the methods of active and tactile learning. More specifically, we consider methods for implementing those techniques into a secondary mathematics classroom.

Definitions

Active Learning:

- A type of learning in which students do meaningful activities that keep them involved throughout the learning process.

Tactile Learning:

- A type of active learning in which students manipulate physical object during the learning process.

Objectives

- Investigate how movement benefit learning.
- Discover ways to utilize that knowledge to assist students.
- Determine how movement can benefit the dynamic of a classroom.
- Identify ways to implement movement into a classroom.
- Choose pedagogic techniques to assist incorporating movement.
- Assess how to utilize both active and tactile leaning to incorporate movement into the classroom.

Pedagogical Techniques and Examples

Active Learning:

Think, Pair, Share: Students think about a problem, then discuss with a partner and share with the class.



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- Ask class, “How does probability appear in your life?” Give students 30 seconds to respond in their notebooks. Pair students to discuss their responses. After two minutes have a full class discussion.

Chalk Board Splash: Students work and answer questions at the board.

Gallery Walk: Students walk around and observe other students’ work. Can be used to showcase students work or as an activity to get them moving around the room.

- Students create graphs to illustrate a concept. Students walk around the room to observe displayed graphs followed by classroom discussion.



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Active Math: Students use their bodies to investigate a mathematical concept.



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- Students walk on different surfaces to explore different slopes.
- Students use the floor to represent a plane and themselves as a point. They investigate transformation as they walk throughout the plane.

Tactile Learning:

Manipulatives: Students use physical objects to explore or model a concept.

- Students investigate probability using dice or coins or M&Ms.
- Student use unit tiles to investigate areas of various geometrical shapes



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How Movement Impacts Learning

Children who are more active exhibit:

- Better focus
- Faster cognitive processing
- More successful memory retention
- Better mental clarity by increasing blood flow to the brain

From the study [2], we find:

- Student performance increased by almost half a standard deviation when active learning was being used in the classroom.
- Students within a class that uses active learning are more likely to be successful in that class.

How Movement Benefits the Classroom Dynamic

Children in the classroom tend to:

- Build better student, teacher relationships
- Develop self-esteem and a sense of belonging
- Improve listening and communication skills
- Laugh more and have fun while learning
- Improve their self-discipline and motivation
- Exhibit improved behavior which in turn helps with student achievement

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