



The Importance of Spatial Reasoning In Elementary Mathematics Course Syllabus

Course Description

This course will delve into the significance of spatial reasoning in elementary mathematics. The aim is to help students understand the value of meaningful experiences in math class, which can lead to a deeper level of conceptual understanding of mathematical concepts. Through an exploration of various instructional practices, the course will focus on the development of spatial reasoning skills to facilitate learning of mathematical concepts. Additionally, the course will examine how spatial reasoning and visual mathematical models align with the Idaho Content Mathematics Standards.

This course enhances classroom teaching effectiveness and supports improved student outcomes by introducing new knowledge in developing spatial reasoning skills to enhance conceptual understanding, visual thinking, and algebraic thinking through research-aligned instructional strategies and meaningful mathematical representations.

Course Objectives

At the end of this course you should be able to:

1. Elaborate on the early predictors of mathematical success.
2. Elaborate on how incorporating a relational perspective of the equal sign into instruction can enhance students' schema and lead to an improvement in mathematical performance.
3. Explain the significance of spatial reasoning in the broader context of developing algebraic thinking.
4. Describe strategies that educators can leverage to foster visual thinking and develop conceptual understanding amongst their students.
5. Explain the different modes of representation and their significance in facilitating students' comprehension and conceptual understanding of mathematical concepts.
6. Describe the key components that comprise a robust framework to facilitate the conceptual understanding of algebraic thinking and mathematical proficiency.

Modules

- Module 1: Early Predictors of Mathematical Success, Quiz 1
- Module 2: The Importance of a Relational View of the Equal Sign, Quiz 2
- Module 3: Understanding the Role of Spatial Reasoning in Algebraic Thinking, Quiz 3
- Module 4: The Importance of Visual Learning in Mathematics Curriculum, Quiz 4
- Module 5: Mathematical Modeling Using Jerome Bruner's Enactive, Iconic, and Symbolic Representation, Quiz 5
- Module 6: Mathematical Framework for Conceptual Understanding, Quiz 6



Grading

Each quiz must be passed at an 80% or higher (three attempts allowed).

Format

This is a self-paced, asynchronous (no required live meetings) course. Throughout the PD course, you will find it helpful to take notes along the way to assist with the quizzes. Within each module, you will find reflection assessments that are not graded but will help in your journey through the course. There is an interactive forum in the course to help you connect with peers and instructors, share ideas, and collaborate on best practices throughout your learning journey.