Title: Mathematics Instruction That Matters the Most

Class Dates: June 9, 10 & 16 (+ 3 hours online)

Class Times: 8:00 AM - 12:00 PM

Class Location:

Instructor(s):

Credits:

Description:

Teachers will read a variety of professional texts related to best practice in math instruction, which will include Number Sense Routines by Jessica Shumway. This book is included in the registration fee for the class. You will receive the book at class. Through discussion, reading, examining student word samples, and engaging in problem solving as a participant, teachers will develop a stronger understanding of number sense, problem solving, and the importance of mathematical talk in accordance with the Common Core State Standards for Mathematical Practice and the establishment of a strong mathematical environment.

Audience: Open

Targeted Subject Area and Grade Level:
K-5 grade level teachers, special education teachers, and administrators

Subject Category: Math

Focus of Instruction: Pedagogy

Learning Goals or Targets:
The participant will understand what students need to be able to do in accordance with how the mathematical practices from Common Core apply to the daily mathematical environment.
The participant will apply understanding of best practice to determine students' needs and instructional steps aligned with best practice for students in their classroom.
The participant will develop a stronger understanding of the meaning of number sense and the importance of mathematical talk in their classroom.

Course Requirements and Participant Evaluation:
Course Requirements:
All assignments completed and handed in
Participation in all discussion forums (including original post and 2 replies)

Participant Evaluation:

A/Pass Grade - Met all course requirements Participants averaged 90% on assignments according to:

Rubric for Design and Implementation of Best Practice of Mathematical Instruction

B/Pass Grade - Met all course requirements Participants averaged 80% on assignments according to: Rubric for Design and Implementation of Best Practice of Mathematical Instruction

C - Met all course requirements Participants averaged 70% on assignments according to: Rubric for Design and Implementation of Best Practice of Mathematical Instruction

D - Met all course requirements Participants averaged 60% on assignments according to: Rubric for Design and Implementation of Best Practice of Mathematical Instruction

F/Fail - Participants either did not finish all of the course requirements

Research Base:
Best Practice: Bring Standards to Life in America's Classrooms (2012) by Steve Zemelman, Harvey Daniels, and Arther Hyde.
Chapter 5 of this text, entitled Best Practices in Mathematics, will allow teachers to understand the instruction shifts required from the Common Core State Standards. Additionally, this text provides background on NCTM and the development of the Common Core State Standards, as well as the qualities of teaching mathematics using best practice. A classroom example is included.
Accessible Mathematics (2009) by Steven Leinwand This text is about importance of students justifying their answers and embedding mathematical problems into real life contexts.
NCTM Principles and Standards for School Mathematics (2000) by NCTM Chapter 3 of this text describes the mathematical process standards put forth by NCTM.
Number Sense Routines (2011) by Jessica Shumway This book provides rich information about the meaning and learning trajectory of number sense, and provides routines to implement in a classroom that can increase students' number sense.
Putting the Practices into Action (2013) Susan O'Connell This book provides a deeper look into what each of the standards for mathematical practice entail and what this might look like in classrooms.
Common Core Mathematics in a PLC at Work K-2/3-5 (2012) Larson, Fennell, Adams, and Dixon This book provides strategies and tips for grade bands to integrate the CCSS in their instruction, curriculum, and assessment.

Course Content/Syllabus:
Day 1:
Purpose: Participants will understand the meaning of best practice in mathematics and how this aligns with the CCSS.
Assignments: Read one of the following, as assigned by instructor:
Best Practices: Bring Standards to Life in America's Classrooms by Hyde, Zemelman, and Daniels (p. 159-185) NCTM Principles and Standards by NCTM (p. 52 -71) Accessible Mathematics by Leinwand (p. 1-5 and 60-71)

Purpose: Participants will learn how to analyze and create math problems that promote conceptual thinking, in accordance with best practice and implementation of the standards for mathematical practice.
Assignments:
Create a math problem requiring mathematical talk Use double entry journal to record reflection of students learning to reflect on implementation

Online work:
Purpose: Participants will learn that number sense is a learning process and will explain how number sense is interconnected in all aspects of math instruction.
Assignments:
Read: Chapters 1 and 2 of Number Sense Routines by Jessica Shumway
Question: Thinking about the reading, learning, and results from assignment one, how do you see the ideas of number sense, mathematical practices, and best practice linked together?
Online response forum

Day 2:
Purpose: Participants will apply their learning about number sense and best practice to the work their students are doing in their classroom, and plan for next steps.
Assignments:
Based on the trajectory, what number sense routine do you feel your students would most benefit from? Read about this routine in part 2 of Number Sense Routines.
Implement in your classroom every day for at least a week.
Reflect in one of the following ways: video tape or in real time, keep a journal of student responses and your learning about those students as a result of their response. Bring reflection back to class.

Online work:
Purpose:
Participants will implement a number sense routine and reflect on student responses and results.
Participants will reflect on students who may need additional support.

Assignments:
Reflection: Reflect on the number sense routine you read about and are planning to implement in your classroom. Describe the routine to other participants. Describe how you, as the instructor, would know this would benefit students and how it is working. What implications does this number sense routine have on future instruction?
Meeting Student Needs: Think of two students in your class who, based on your data and observations, may need more support than a whole group number sense routine can offer them. Describe these two students. In your description, include areas of strength, areas of concern, and specific skills they are struggling with.
Online response forum

Day 3:
Purpose: To be determined, based on teacher needs, interests, and responses in previous class discussions, forum responses, and assignments.
Assignments:
The activities in this face-to-face class meeting are to be determined based on needs and interests of participants.

For EDMA graduate credit, students will complete the required 30 out-of-class hours by doing the following:
1. Read pages 159-185 of Best Practices: Bringing Standards to Life in America's Classrooms (2012) by Harvey Daniels, Arther Hyde, and Steve Zemelman; pages 1-5 and 60-71 of Accessible Mathematics

(2009) by Steven Leinwand; and pages 52-71 of Principles and Standards for School Mathematics (2000) by NCTM 2. Take notes on reading in format designated by the instructor 3. Read chapters 1 and 2 of Number Sense Routine (2011) by Jessica Shumway 4. Read additional chapter of Number Sense Routines (2011) by Jessica Shumway in correlation with assignment 5. Choose a number sense routine, plan for implementation, implement with students for one week, and reflect on implementation (assignment) 6. Design a problem solving activity to implement with students and examine students results (assignment)

Course Rubric:

Best Practice in Mathematical Instruction

**The following evaluation criteria is based on Domain 3d "Using Assessment in Instruction" and Domain 3E "Demonstrates Flexibility and Responsiveness" from Charlotte Danielson's Framework for Effective Teaching.*

Evaluation Criteria	Meets Criteria	Does Not Meet Criteria	Comments
Learning Objective: Teacher clearly articulate the learning target to students, including (when necessary) the criteria and performance standards by which their work will be evaluated.			
Monitoring of Student Learning: Lesson design actively and systemically elicits diagnostic information from individual students regarding their understanding and monitors the progress of individual students.			
Feedback to students: Lesson design outlines a plan to provide feedback to students in a timely manner. The feedback is consistently high quality, and asserts an avenue for students to make use of the feedback in their learning.			
(OPTIONAL) Student self-assessment and monitoring of progress: Lesson design could provide opportunities for students to frequently assess and monitor the quality of their own work against the assessment criteria and performance standards. It also could			

provide opportunities for students to actively use the information for their learning.			
(OPTIONAL) Lesson adjustments: Lesson design could articulate the instructional adjustments to the learning progression (either during the lesson or to future lessons) as needed, evidenced by the formative assessment data.			