

Preparing for Purposeful Manipulative Use

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EDTC 6332 – Educational Technology Practicum

Needs Assessment

Instructional/Training Problem

- Elementary teachers have access to math manipulatives, but they are not always used consistently or effectively.
- Classroom observations and coaching conversations have shown missed opportunities because teachers may be unsure how to efficiently prepare materials, manage their use during instruction, or intentionally plan for manipulatives within a lesson.

Needs Assessment

Skills and Knowledge Gap

- **Current:**

Teachers may avoid using manipulatives because they are unsure how to prepare them efficiently, establish systems and procedures for their use, or determine how to intentionally incorporate them into a lesson.

- **Desired:**

Teachers can efficiently prepare manipulatives, establish manageable systems and procedures for their use, and intentionally plan for manipulatives within a lesson.

Needs Assessment

Recommended Solution

- A short, self-paced, web-based training module that provides elementary teachers with a repeatable process for preparing, managing, and planning for the purposeful use of math manipulatives.

Instructional Goal:

After completing the training module, elementary teachers will be able to efficiently prepare and manage math manipulatives and intentionally plan for their purposeful use during instruction.

Performance Objectives:

After completing this training module, the learner will be able to:

- Select appropriate strategies for efficiently preparing math manipulatives before instruction.
- Develop a system for distributing, using, and collecting math manipulatives during instruction.
- Develop a plan for intentionally incorporating a math manipulative into a lesson to support the instructional objective.



Assessment of Learning Outcomes:

Performance Objective	Assessment
1. Select appropriate strategies for efficiently preparing math manipulatives before instruction.	Learners will review a short classroom scenario and select the most appropriate preparation strategy. They will receive immediate feedback explaining why the selected strategy would or would not support efficient preparation. Objective 1 Target: <i>Selects the appropriate preparation strategy for the given scenario.</i>
2. Develop a system for distributing, using, and collecting math manipulatives during instruction.	Learners will create a simple management plan that identifies how manipulatives will be distributed, expectations for student use, and how materials will be collected at the end of the activity. Objective 2 Target: <i>Management plan addresses distribution, expectations for use, and collection of materials.</i>
3. Develop a plan for intentionally incorporating a math manipulative into a lesson to support the instructional objective.	Learners will complete a short planning activity using a lesson of their choice. The plan will identify the lesson objective, the manipulative to be used, the purpose for using it, when it will be used during the lesson, and what needs to be prepared beforehand. Objective 3 Target: <i>Plan identifies the instructional objective, manipulative, purpose for use, when it will be used, and necessary preparation.</i>

Learner Characteristics:

Learner Characteristic	Implication for Design
Elementary teachers with varying levels of teaching experience	The training will provide a consistent process that can be applied across grade levels and levels of experience.
Teachers are experienced in creating classroom systems and procedures	The training will build on these existing skills and focus specifically on developing systems for preparing, distributing, using, and collecting manipulatives.
Teachers are proficient in lesson planning	The training will not teach lesson-planning basics. Instead, teachers will apply their existing planning skills to deliberately include manipulatives when they support the purpose of the lesson.
Teachers have varying levels of experience intentionally incorporating manipulatives into instruction	The training will use examples, scenarios, and application activities focused specifically on decisions involving manipulative preparation, management, and purposeful use.

Learning Context:

- The training will be delivered as a self-paced, web-based module that elementary teachers can complete independently at school or at home. Learners will need a computer with Internet access and will have access to the math manipulatives and curriculum materials already available on campus.
- Because teachers have limited planning and professional development time, the module will be designed to be concise and practical. Teachers will be able to move through the training independently, revisit content as needed, and apply the strategies to their own classroom instruction.

Training Module Outline:

Introduction

- Overview: Why purposeful manipulative use matters
- Training goal and performance objectives
- Short opening scenario:
 - *You have a lesson tomorrow that includes manipulatives. What needs to happen before, during, and within the lesson plan for their use to be successful?*
- Introduce the Prepare → Manage → Plan process

Topic 1: Prepare

- Preparing manipulatives before instruction
- Organizing materials based on how they will be used
- Strategies for reducing preparation and transition time
- Learner interaction:
 - Teachers review a classroom scenario and select an appropriate preparation strategy.
- Feedback:
 - Immediate feedback explains why the strategy would or would not make manipulative use more efficient.

Training Module Outline:

Topic 2: Manage

- Applying existing classroom systems and procedures specifically to manipulatives
- Establishing procedures for distributing materials
- Setting expectations for student use
- Procedures for collecting and storing materials
- Learner interaction:
 - Teachers review a classroom scenario and develop a simple system for distributing, using, and collecting the manipulatives.

Topic 3: Plan

- Identifying the instructional purpose for using a manipulative
- Determining when in the lesson the manipulative will be used
- Considering what students should gain from using it
- Identifying what needs to be prepared before the lesson
- Learner interaction:
 - Teachers use a sample lesson to practice deliberately planning for manipulative use.

Training Module Outline:

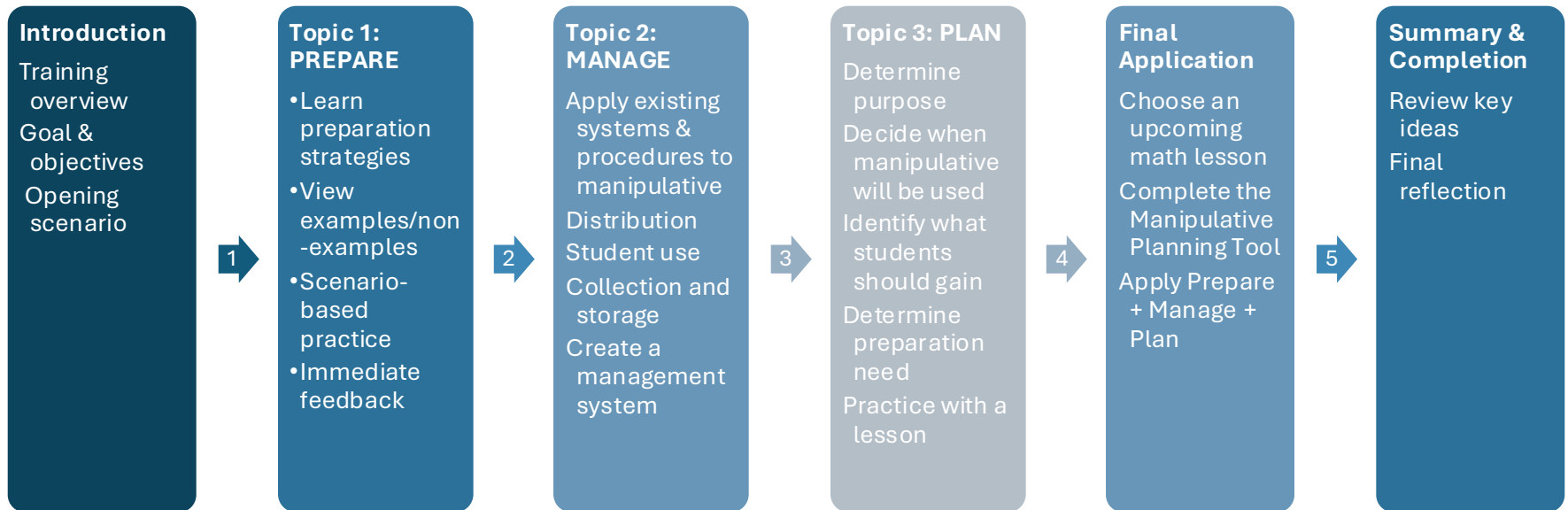
Assessment / Application

- Teachers select one of their own upcoming math lessons.
- Identify the instructional purpose for the manipulative.
- Develop a preparation plan.
- Establish a system for distributing, using, and collecting the materials.
- Identify when the manipulative will be used within the lesson and what students should gain from its use.
- Submit the completed Manipulative Planning Tool as the final product.

Instructional Resources:

- Computer or laptop with Internet access to complete the self-paced training module.
- Math manipulatives available in the teacher's classroom or on campus to use during application activities.
- Upcoming math lesson or lesson plan to use during the final application activity.
- Manipulative Planning Tool provided within the training to guide teachers through preparing, managing, and intentionally planning for manipulative use.
- Campus math curriculum materials to reference when applying the process to an upcoming lesson.

Training Module Blueprint:



Formative Evaluation:

- **Subject Matter Expert (SME) Review**

Math Teacher Course Leader will review the training module for accuracy, relevance, and alignment to math instruction. Feedback will be used to determine whether the strategies, examples, and activities support the purposeful use of manipulatives.

- **Small Group Evaluation**

A small group of elementary teachers will complete the training module and provide feedback on its clarity, usability, pacing, and relevance to the math classroom. Their feedback will be used to identify areas that may need revision before the final version is completed.

Summary

- This design plan outlines a self-paced training module designed to help elementary teachers make the use of math manipulatives more manageable and purposeful. The training builds on teachers' existing classroom management and lesson-planning skills by focusing specifically on how those skills can be applied to manipulatives.
- Through the Prepare, Manage, and Plan process, teachers will learn strategies for efficiently preparing materials, creating systems and procedures for manipulative use, and deliberately planning for manipulatives within instruction. By the end of the training, teachers will apply the process to an upcoming math lesson they can use in their own classroom.

Declaration of AI Use

This design plan was developed based on my own professional experiences, observations, and ideas. ChatGPT was used to review the project for clarity, organization, grammar, and alignment with the project requirements but did not contribute to the writing, analysis, or interpretation of the material.