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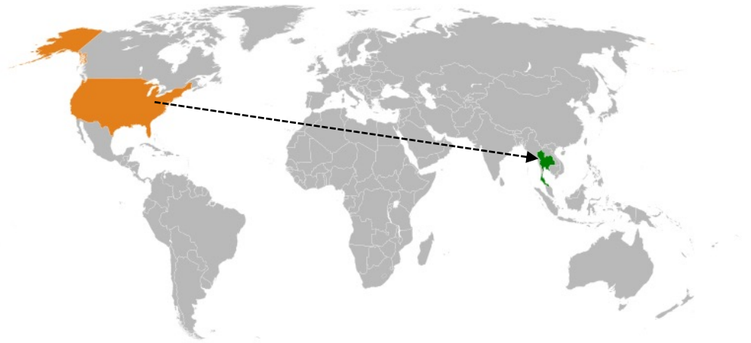

Thai In-Service Teacher's Reactions to a United States-Based Teaching Practice

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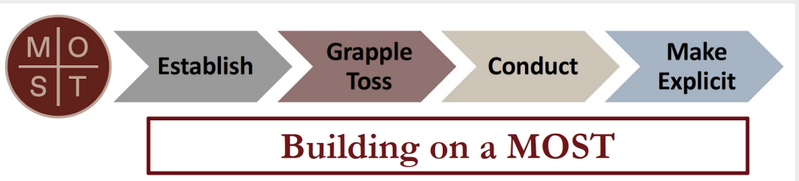
A **MOST** is a **M**athematical **O**pportunity in **S**tudent **T**hinking



Building on a MOST is engaging the class in making sense of the MOST to better understand the **Mathematics** of the MOST.

Figure 1: The Teaching Practice of Building on a MOST (Adjusted from Leatham et al., 2022)

The teaching practice **building on a MOST** provides a structure for teachers to more productively lead discussions around high-leverage student contributions (Stockero et al., 2023).

Theoretical Framework: We grounded our work on the idea of *cultural transposition* proposed by Mellone and colleagues (2019).

Figure 2: Our Interpretation of the *cultural transposition* from Mellone et al.'s (2019) Study

In this study, we adjusted Figure 2 as shown below:

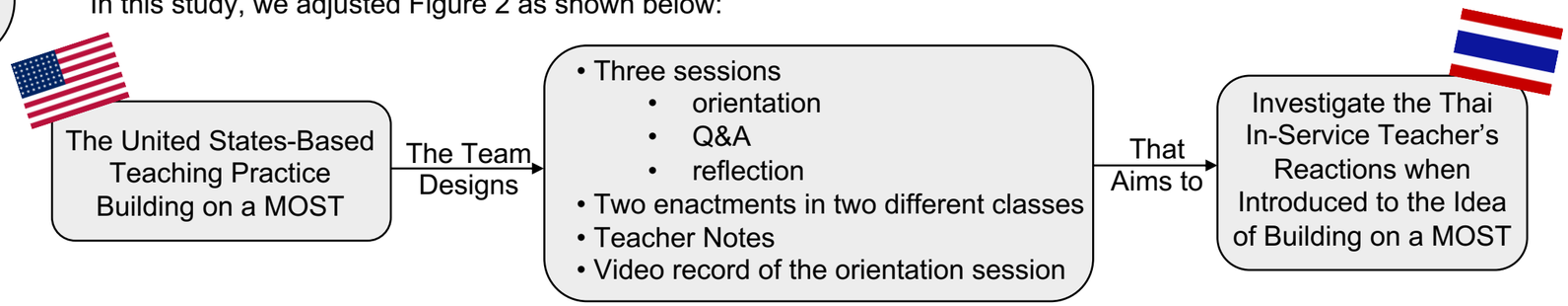


Figure 3: Our Theoretical Framework for This Study

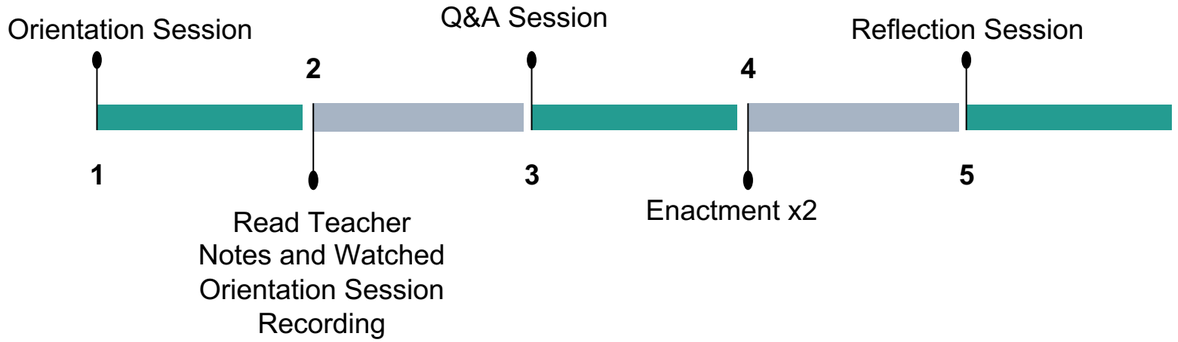
Research Question: *What are a Thai in-service mathematics teacher's reactions when introduced to the idea of **building on a MOST**?*

Methods: As the first phase of this project, we identified a Thai teacher who had expressed interest in learning about the MOST project. The first three authors are from Thailand, the United States, and Turkey, respectively, and had all worked on the MOST project. They collaborated with the researchers who conceptualized the practice (Stockero et al., 2023) to develop session materials for sharing the practice with teachers outside the United States.

Data Collection: To reveal the teacher's reactions, we used responsive interviewing throughout three sessions:

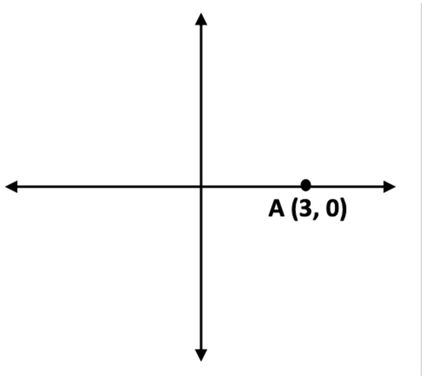
(a) an *orientation session* for introducing the practice to the teacher for the first time;
(b) a *Q&A session* for the teacher to ask any questions to help prepare for implementing the practice in two classroom enactments;
(c) a *reflection session* for understanding the practice through the teacher's experience after implementing the practice in Thai classrooms.

Timeline of Teacher Activities:



Context of the *MOST-Eliciting Prompt* [MEP; for more details about MEPs, see The MOST Research Project (2023)]

Task:
Is it possible to select a point *B* on the y-axis so that the line $x + y = 6$ goes through both points *A* and *B*? Explain why or why not.



MOST: Yes. Point B is (0, 3) because you get 3 + 3 = 6.

Mathematical Point of the MOST: An ordered pair, (x, y), is a solution of an equation (and is therefore on the graph of that equation) if, when both x and y are substituted into the equation, the equation is true.

Note: We communicated with the Thai in-service teacher in Thai, and the data was translated from Thai to English.

Data Analysis: We used Mellone et al.'s (2021) data analysis as our guideline to analyze the Thai in-service teacher reactions when introduced to the idea of building on a MOST.

- The *unthoughts* on using student mathematical thinking in a whole-class discussion—the expression of cultural beliefs absorbed in the *past*
- The *causes* that provoked the *unthoughts*—after enacting the teaching practice of building on a MOST twice in two different classrooms in the *present*
- The *changes* in the Thai in-service teacher's enactment of building on a MOST—in the *intentional future*

Results & Discussion:

"...maybe I teach [students] procedurally. …[during the enactments] they did use step-by-step process to solve the equation and it seemed correct. However, they mixed up when using x and y to substitute in the equation…"

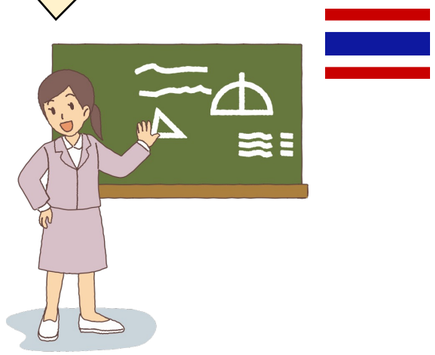
Unthought

"Before implementing, my worry was it would be hard for this MOST to come out authentically. I thought students would not provide any reasoning [the researcher] provided in the teacher notes. … However, I was wrong because suddenly [when enacting the practice] in two classrooms, they did provide exactly what the teacher notes suggested. … I did not think that students would bring x and y from the different points. Because based on my prior knowledge, we could not bring x and y from the different points, and when I taught, I always pointed out that x and y come from one point. This is my first time I acknowledge that students had this kind of mathematical thinking…"

Cause

"Yeah, [I will use this practice in my future teaching] as I said…. [The benefit of this practice is] it provides an opportunity for students to think more … Once students are able to finish thinking individually [about the task], they are given the chance to hear other students' thinking and make sense of [their peer's claim—the MOST.] Sometimes, I did not do that. They would get only their own ideas and teacher's ideas. Doing this practice helps them see another student's thoughts. Then, their answers might change, or they might have more questions after listening to their peer's claim. Their thoughts expand…"

Change



Task design (the *MOST-eliciting prompt*) and opportunities to enact the task by following the four elements of the teaching practice building on a MOST (*Establish*, *Grapple*, *Conduct*, and *Make Explicit*) provoked the awareness of Thai in-service teacher regarding the importance and the power of using student mathematical thinking for supporting student learning during the whole-class discussion.

The teacher was surprised that the mathematical task used to introduce the practice was designed to trigger a misconception. In her experience, tasks were created with only the correct solutions in mind. Thus, enacting the practice twice brought her attention to a misconception that she did not expect students in her class to have—students took x and y from different points to substitute in an equation and claimed that ordered pair (x, y) is a solution of the equation.

After being introduced to the practice, the teacher realized opportunities for students to explore mathematics in their own ways were not previously provided in her classroom. Instead, leading questions to narrow student mathematical thinking towards the correct solutions were the classroom norm. The teacher plans to seek out MOSTs in other mathematical lessons and have students build on each others idea to better understand the mathematical point of the MOST.

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