

Session Title:

Learning Theory-Driven Professional Development—Stories from Two MSP Projects

MSP Project Names:

- Promoting Excellence in Arizona Middle School Mathematics: Increasing Student Achievement through Systemic Instructional Change
- Making Mathematical Reasoning Explicit

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Collaborative Session**Strand 2****Summary:**

Learning Theory-Driven Professional Development (LTDPD) empowers teachers to engage students in learning experiences derived from research about how students learn. Two MSP projects are implementing forms of LTDPD. The Arizona Mathematics Partnership is a targeted middle school mathematics MSP project that involves Scottsdale, Chandler-Gilbert, and Glendale Community Colleges and 7 school districts in the Scottsdale area. Making Mathematical Reasoning Explicit is a K-12 mathematics institute project that develops a cadre of teachers to serve as school- and district-based intellectual leaders and master teachers in rural eastern Washington and northern Idaho schools. Both projects are guided by mathematics learning theories. Session participants will learn about LTDPD, the results of prior research efforts, and how these two MSP projects are utilizing LTDPD.

Section 1: Questions framing the session:

Leaders of the two projects will address the following questions.

1. How has your project's learning theory statement influenced professional development?
2. How has LTDPD influenced your research and project implementation?
3. What do you see as the advantages and disadvantages of the LTDPD approach?

What advice would you give to others considering the use of the LTDPD approach?

Section 2: Conceptual framework:

Too often a lack of an agreed-upon definition of what high-quality instruction looks like diminishes the effectiveness of any effort to improve instructional practices. According to the Harvard Graduate School of Education, “In most instances, principals, lead teachers, and system-level administrators are trying to improve the performance of their schools without knowing what the actual practice would have to look like to get the results they want at the classroom level.” (City, 2009, p. 32). This phenomenon is one reason implementing reformed instructional practices is so challenging. In many cases each teacher in a school has a different vision of effective instructional practices. Furthermore, they believe that their own vision is what is best for their students and that they are carrying out that vision to best of their ability. Consequently, there is little reason to critically examine or change those instructional practices. When working with a staff of teachers that make up any given school, it is apparent that some of those visions about effective instructional practice are actually more or less effective than others.

To address this challenge, RMC Research has encouraged the leadership of projects that have a strong professional development component to examine the research literature and develop a concise learning theory statement that describes the type of learning experience students should have to learn the subject. For example, the Making Mathematical Reasoning Explicit (MMRE) project has adopted the following statement:

If teachers use rich mathematical tasks combined with purposeful and probing questions to engage students in discourse and the use of the tools (notation, symbolization, graphs, charts, etc.) of mathematics to:

- Explain and justify their mathematical reasoning (justification), and
- Develop and verify mathematical generalizations,

Then students will be more engaged in learning and doing mathematics resulting in an increase in student achievement and increased enrollment and success in challenging and advanced secondary mathematics courses.

A learning theory statement is also referred to as a theory of action. This particular statement is powerful because it describes what high-quality instruction looks like in practice for both the teacher and students and identifies the expected outcomes. Learning theory statements are most useful if they are grounded in cognitive science research, describe what students do to learn, is recognizable when students are doing it, and is believable among teachers.

A concise learning theory statement helps a project focus the professional development offered, provides teachers and administrators a common vision of what high-quality instructional practices elicit from students, provides a conceptual framework for the research and evaluation, and increases the likelihood that the project will produce measurable results.

Section 3: Explanatory framework:

Both the Arizona Mathematics Partnership (AMP) and the MMRE projects have a logic model that contains a learning theory statement that represents an interpretation of a broad range of landmark research literature such as *How Students Learn* and the *Common*

Core State Standards for Mathematics: Standards for Mathematical Practice. The statements have subtle differences that contribute to variations in project implementation that will be compared and contrasted during the session.

Section 4: Discussion:

Both AMP and MMRE are in the early stages of project implementation. The planned research and evaluation activities will examine the impact of the LTDPD implemented for each project on the mathematics achievement of students in the participating schools compared to that of students in demographically matched samples of nonparticipating schools. The findings are not available at this stage of implementation.

Although the AMP and MMRE professional development offerings are similar, the content and focus of the professional development are distinct partly because of differences in the learning theory statements. The session will delve into how these differences relate to the distinctions in the focus of the professional development and project implementation.

Section 5: How will you structure this session? What is your plan for participant interaction?

The session will begin with a brief overview of each project and an overview of LTDPD, how it evolved, and a summary of findings from previous research on LTDPD models. The overview portion of the session will be limited to 10 minutes. Handouts will include a fact sheet about each project that includes information about the leadership, goals and objectives, professional development model, learning theory statement, and more. The main portion of the session will be a panel discussion in which AMP and MMRE project leadership representatives will share their learning theory statements and address the following questions:

1. How has your project's learning theory statement influenced professional development?
2. How has LTDPD influenced your research and project implementation?
3. What do you see as the advantages and disadvantages of the LTDPD approach?
4. What advice would you give to others considering the use of the LTDPD approach?

Each project will identify a panel member to answer each question, and every panel member will have approximately 2 minutes to answer his or her question. Panel members will be encouraged to prepare their responses ahead of time to ensure that the session adheres to the agenda and time allocation.

The final 10 minutes of the session will be reserved for questions. The panel moderator will facilitate the question and answer portion of the session, ensuring that the responses are brief to allow time for a range of questions. In the event that few questions are posed, the panel members will have the opportunity to expound upon their responses to the discussion questions.

References:

City, E., Elmore, R., Fiarman, S., & Teitel, L. (2009). *Instructional rounds in education*. Cambridge, MA: Harvard Education Press.