

Tips for Facilitators

DMI seminars are led by facilitators with varying professional backgrounds and in a range of settings. They include teachers working with colleagues, university faculty, staff development personnel, and school administrators. For some, leading a DMI seminar is a first experience as a teacher-leader or teacher educator; others have had many years of service in this role.

Through conversations and written reflections, the seminar facilitators provide us, DMI's developers, with feedback about their experiences piloting this curriculum. The following tips include their suggestions, some directly quoted, for getting oriented to the materials, preparing individual seminar sessions, creating a community of inquiry, facilitating discussion, understanding participants' emotions, and responding to portfolio assignments. It concludes with an annotated bibliography of recommended supplemental readings.

Getting Oriented

Before conducting a DMI seminar, familiarize yourself with both the overall goals of the curriculum and the variety of materials provided. DMI has been organized to support teachers as they: 1) recognize themselves and the children they teach as mathematical thinkers, 2) deepen their understanding of the core ideas of the elementary mathematics curriculum, 3) explore how children develop those ideas, 4) reflect on their own experiences to analyze the process of learning, and 5) rethink their teaching practice.

The DMI materials include a number of components:

- **Case discussions**, which provide opportunities for teachers to follow student thinking, work on mathematical ideas for themselves, reflect on their own learning, and consider classroom settings and teaching strategies that support the development of student understanding.
- The **video tapes**, which serve as a vehicle for investigating children's mathematical thinking in real time, capturing both classroom atmosphere and student affect.
- **Math activities** and discussions, which allow teachers to develop, share, analyze, and refine their own mathematical thinking.
- **Activities involving lessons from K-8 mathematics curricula**, which help teachers connect their seminar learnings with the mathematical tasks they set for their students.
- **Essays on related research**, which support the development of an integrated picture of the ideas presented in the modules and connect the events in the cases and in participants' own classrooms to the work of the research community.

In addition, teachers are given regular portfolio writing assignments, to be completed between sessions; these are of two types: 1) reflections on what they are learning in the seminar and 2) investigations into their own students' mathematical thinking.

To become familiar with the flow of mathematical ideas in a DMI module, we suggest reading the introduction to the module, the introduction to the cases in each section, and the essay on related research. We also recommend reading portions of Maxine's Journal, an account, from a (fictional) facilitator's perspective, of one group's seminar experience. In

addition, you may find it useful to examine some of the cases and look through the detailed agendas and handouts.

Preparing for a Session

Once you are familiar with the goals and components of the DMI materials, the next step is to prepare for individual sessions. For each session, you should read the cases first, then the relevant section of Maxine's Journal, and, where applicable, do the math activity, view any accompanying video, and familiarize yourself with the appropriate lessons from the K-8 curricula. As you do this work, think through the issues highlighted in the set of activities. What are the ideas about mathematics, learning, and teaching that should emerge as participants engage in the investigations and discussions? How are they illustrated in the cases? How might they arise in the other activities? What questions might you pose to bring seminar participants' attention to these ideas? As one facilitator wrote:

I realize now more than ever how important it is to be really prepared and to have thought through the issues, mathematical and otherwise, that might arise. Having a sense of what the important points are that you want people to be exploring and the direction in which you want them to be headed is crucial. However, it is important to realize that sometimes the way there might turn out to be a different route from the one you anticipated.

In addition to planning for issues likely to arise during discussions, you must think through the order of the activities and set a timetable. Organize the materials so everything is ready for each session: Having the readings, hand-outs, video tapes, video equipment, and

manipulatives at hand before the session begins saves time and allows you to concentrate on seminar participants. Suggestions for time allotments and the order of activities are included in the agendas, which also contain a detailed list of the materials you will need for each session.

Creating a Community of Inquiry

One of the objectives of the DMI curriculum is to establish a "community of inquiry," a sense of shared purpose and norms of conduct which allow participants to focus on ideas, their own and those of their colleagues. This is not accomplished in a single session, but develops slowly. As one facilitator wrote, "I believe this climate of inquiry is created through careful work and planning over time with caring facilitators and willing participants. It never just happens. It requires constant nurturing, sensitivity, and organization."

Each teacher brings to the seminar experiences and ideas from which the others—and you, too—can learn much. As facilitator, it is your job to encourage participants to put those experiences and ideas on the table.

The tone of the seminar should be set at the very first meeting with the establishment of norms for discussions in which all ideas are valued and questioning is perceived as a sign of strength, not weakness. Listening to what is said, rather than for what one expects, is crucial to creating a community in which ideas are heard and respected. What is the participant saying? What are the ideas behind the words? How are his or her ideas related to those of the other participants? How are they different? "The purpose of [our] work is not about getting other teachers to think the same way, but rather to encourage an environment in which participants value, reflect on, and question their own ideas and the perspectives of others."

Another facilitator wrote, “As facilitators, we must create a pathway for learning that is challenging but safe. We must listen carefully to the comments our new fellow-travelers will share, empathize with their frustrations, help them through times of vulnerability, and share in the pleasures of their new insights.”

Communicating clarity of purpose at the very start of the seminar is vital to setting the tone. For instance, by making it clear that sessions will begin and end on time, you convey a message of commitment. “Careful, productive, and appropriate use of time is a courtesy to the participants which indicates that you are respectful of their decisions to be there in the midst of their busy lives and tight schedules.”

Other ground rules to be addressed at the first meeting concern assignments and attendance. Unlike many college courses or staff workshops, the success of the DMI seminar depends on participant preparation. Written homework and thoughtful reaction to assigned readings provide a starting point for the work of the session. Participants may have other expectations, so this should be stated explicitly. Attending each meeting with completed assignments prepares teachers to participate in seminar activities and is a sign of respect for other members of the group.

Not all participants will feel comfortable speaking up or offering their opinions in whole-group discussion. Engagement with the ideas of the DMI curriculum can take many forms. People may be listening carefully, following the discussion, reflecting on what they hear, and formulating opinions of their own without sharing their thoughts aloud. Over time, participants will need support in seeking their own levels of verbal engagement. Among the strategies that

encourage participation are: allowing enough “wait time” for people to formulate their ideas, asking for a paraphrase of an idea, or asking for agreement or disagreement on particular points. During whole-group discussion, facilitators should ask clarifying questions, call attention to connections between participants’ ideas, and pose questions designed to move the discussion forward.

The second session includes an activity designed to help participants set group norms for respectful interaction. These norms should be revisited periodically.

Participants need to feel safe, whether sharing hypotheses or feelings. Adults’ beliefs have developed over many years, and transforming those beliefs is a complicated process. An environment of inquiry, in which thinking is taken seriously and challenging ideas is viewed as a sign of respect, has to be cultivated.

Facilitating Group Discussion

For participants, small-group discussion provides a more intimate, certainly less intimidating, forum for sharing their perspectives, than does discussion among the whole group. In the small group, participants may explore mathematical ideas for themselves and pose questions about teaching, about learning, and about student understanding, activities which may feel riskier in the larger format. Furthermore, in a group of two, three, or four, there is more time to air ideas than in a group of 15 to 30.

While participants are meeting in small groups, what is the facilitator’s role? When should you begin to move among the groups? When should you ask a question, add a comment, or just be a silent observer?

After setting small groups to work, allow time for them to get into meaningful discussion without being distracted by the facilitator. Then, once such discussion is underway, listen in on each of the small groups to provide yourself with an overview of participants' interests, questions, and concerns. Moving among, and stopping by, each of the groups also communicates interest in the ideas being discussed and reassures participants that their discussions are useful and productive.

Sometimes, people in small groups are "off task" or are moving in an unproductive direction. Then it is necessary for the facilitator to focus the discussion on a specific point: evidence of mathematics learning presented in the cases, say, or a question the group might address through the math activity. If someone in the group is particularly engaged by the seminar task, questions inviting the rest of the group to consider her/his ideas are helpful—for example, "What do you think about what _____ is saying?"

Small-group discussion offers opportunities for the facilitator to monitor group dynamics. How are group members relating to one another? Are all of the participants contributing to the discussion? Are participants' ideas being respected?

[Interacting with small groups] is not about having a right thing to do, but having a stock of alternatives and knowing when to call on which. Ask questions when the group needs to move, ask questions to understand their thinking, listen to affirm, refer to what you heard to encourage someone to speak, or refer to it because you think participants can make a connection that might be useful.

Listening to small-group discussions helps you gather information and make decisions about the whole-group discussion to follow.

To initiate whole-group discussion, you might choose from among several strategies:

- Bring out an issue that caused confusion in small groups: "It seems that lots of people are struggling with the idea that _____, and so I thought we could come together to see if we can sort it out."
- Begin with an idea that some groups found stimulating: "Many of you were discussing _____, so I think it would be worth our while to discuss where you agree and where your interpretations and perspectives differ."
- Highlight a point made in one small group that is important for everyone to consider: "_____ said something that left me thinking. . . ."
- Draw the group's attention to an issue that had been ignored in small groups: "As I went from group to group, I heard lots of interesting and important ideas, but I didn't hear anyone talking about _____"

The strategy you employ to begin a whole-group discussion depends on the ideas you want to pursue and the issues that arise during small-group time. In general, however, whole-group discussion should not be a simple rehash of what went on in small groups. Its purpose should be to raise discussion to a new level, "to encourage ideas, thoughts, and conjectures to surface for all to grapple with."

There are strategies particular to facilitating case discussions: The whole group can begin focus on a particular aspect of a case, such as one or two children's thinking, in order to

move to a larger concept or issue. As the discussion of children's mathematics unfolds, you should ask that line numbers be cited. This technique draws everyone into the specifics of the case, focuses the conversation on the mathematical ideas of the children, and helps avoid generalized critiques of classrooms and teaching strategies. If necessary, slow the pace of discussion and provide time for thinking about and reacting to what is being said by recording on chart paper or blackboard ideas that emerge from the group.

Understanding Participants' Emotions

People enter the seminar with expectations based on their past staff development experiences, experiences which may differ from those DMI offers. For example, some participants may feel disappointed that they are not leaving each session with activities for their classrooms. On the other hand, they may feel excited about learning the mathematics for themselves, investigating children's mathematical thinking, or following the development of children's mathematical understanding over time. As one participant wrote about how she had to readjust her thinking to appreciate what she was learning,

I was a little surprised at the type of seminar this class turned out to be. I compare it to approaching a glass and thinking that you are going to be drinking chocolate milk and ending up drinking tomato juice. At first you are surprised and then you change your mental image and readjust your taste buds. This is what happened to me through the course of this class. I was expecting something else, but since discovering what will be offered, I am ready to adjust my thinking.

Now that I know I am drinking tomato juice instead of chocolate milk, I think I can enjoy this seminar more. (By the way, I do like tomato juice.) I appreciate seeing things in new ways because as a youth I was taught only procedures. Because I was successful at that, I figured it was the best practice for my students. This class has made me see things differently.

You may have to tell participants explicitly that the seminar may challenge their present ways of thinking and even their conceptions about what it means to be a good teacher. Feelings of ambivalence or resistance are to be expected.

Early on in one of the pilots, a participant wrote about how the seminar had shaken her confidence, even as it promised a new and enhanced professional identity:

After the first two sessions I asked myself where were we going? I didn't know. It was then that I started to pay attention to the word inquiry. I thought I was already doing this. I'd begun to have self-doubts and a feeling of frustration was beginning to build. . . .

My first deduction after three sessions was hmmm—I really wasn't paying enough attention to my students' thinking. I was still doing a lot of assuming.

So you are making me think and you're shaking me out of complacency. What do I expect??—to get better at what I do. I think you're taking me down a completely new road.

Although listening carefully to what participants are saying about the seminar is often unsettling, as a facilitator it is important to be aware of their questions and frustrations.

Attending to participants in this way communicates your concern and respect for them. At times,

you may find that small adaptations alleviate their problems. And at times, you may learn that their frustrations are part of the process of learning and do not indicate a problem at all. For example, after reviewing participants' evaluations at the end of her seminar, one facilitator wrote that, when respondents gave their overall seminar experience the highest rating—"very valuable"—she was pleasantly surprised, "since participants expressed significant frustration, critical questioning, anger, discomfort, and resistance throughout the course."

Since it is not possible or appropriate for all participants to express concerns, questions, and frustrations during seminar discussions, it is useful to have a variety of strategies for keeping in touch with individuals. Exit cards are an efficient way of gathering this information. Through posing one to three questions for participants to respond to in writing before they leave the session, you may discover what people are learning, what they are concerned about, and what questions they have.

Responding to Writing Assignments

Throughout the DMI seminar, participants complete a variety of writing assignments. Some of the assignments are designed to encourage teachers to examine the mathematical thinking of their own students. Other writings provide a vehicle for the teachers to articulate and clarify their ideas.

Responding to writing assignments is important, because it provides an opportunity to respond to each individual in the seminar uniquely. You can provide mathematical challenge for some and mathematical support for others. When they write about the work of their own students, you can bring their attention to aspects of their students' ideas that connect to

significant conceptual issues. You can also use your written response to expand on an idea or issue that a specific participant in the seminar raised but that was not pursued; either because of time constraints or because it was significant to only a few participants.

Responding to participants' writing is not easy. This task places a demand on facilitators which may be new to some who in the past have offered professional development with different models. One educator describes how he came to see the value of responding to his participants' writing and explains his methods for becoming more fluent at such writing in the linked essay, [Is the Writing Component of Developing Mathematical Ideas Really Necessary?](#)

[Would it be better for this essay to have a separate page or continue right here?]