



Chapter 1

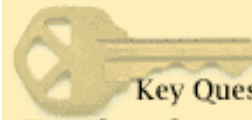


Schoolyard Ecology Leaders' Handbook

Modeling professional practice as leaders

Overview

You can provide your teachers with a rich model for professional practice simply by the way you and your co-leader act before, during, and after the SYE Institute. This starts with the way you set up your leadership team and your program. It means that way in which you teach your participants as adult learners in modeling professional practice for them as teachers of children. It includes the way you comport yourself outside, the way you care for the environment, your enthusiasm for inquiry and learning, your scientific rigor, and your commitment to educational excellence. You are asking teachers to do a lot. One of the best ways to do this is to show them how by example!



Key Questions:

- *What do you want to model?*
- *Why is modeling important?*
- *How can you model what you want?*
- *What are the limits to modeling?*



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Chapter 1



Schoolyard Ecology Leaders' Handbook

Modeling professional practice as leaders

Background & Rationale

Why An Emphasis on Modeling Professional Practice?

Perhaps the most compelling and far-reaching discoveries made by many SYEFEST leaders was the importance and challenge of modeling professional practice in our work. This realization starts with an obvious one - that many, if not most, teachers will instruct their students in similar ways to what they experience as learners. If they are taught via short, hands-on activities, they are likely to teach that way; if they learned via lecture, then that technique might be more natural for them.

But there is more to it than this, more dimensions than simply transferring activities from one context to another. Other considerations are also involved, such as the behaviors and attitudes teachers experience when they interact with their own instructors or leaders. Was the leader actively interested in the subject, was she a curious and critical thinker, did he focus on deep understanding or touch on many ideas quickly, did the leaders respect each other and appreciate the expertise each brought to the program?

Thus, if you want teachers to learn (e.g., important ideas in ecology) or change (e.g., develop a new approach to teaching ecology) and not just to adopt a new activity, then you must teach the way you want them to teach. And this involves modeling at several levels:

- The way you teach, including how flexible and responsive you are.
- The way you structure your overall agenda.
- What you include in your agenda, including assessment and devising activities that suit a diversity of learning styles.
- Your passion, curiosity, and interest in the subject at hand and in learning more about it.
- The way you act towards the organisms and environments you are studying.
- The way you treat your co-leader and the discipline and expertise they represent.
- How you structure the leadership team itself.
- Your interest and commitment to the teachers over the long haul.

In the [Strategies](#) section, we provide some concrete suggestions on how to be a positive and effective model in these different ways. Clearly, a crucial first step is to decide not only how you want to be a good model, but what you view as "good." This decision is based on deciding what standards for professional practice you wish to model? It is not surprising that these standards will bear a striking resemblance to the list of attributes you hope to nurture, develop, and support in your teacher participants. Thus, it is essential to spell these standards out and make them specific to your own practice.

Ideal attributes of the "inquiry teacher"...

- Is willing to take risks.
- Is excited about new things.
- Enjoys sharing with others and seeing others learn.
- Realizes how much she/he doesn't know.
- Questions and is curious.
- Is open to new ideas and a good listener.
- Is introspective and reflective.
- Is adaptable and flexible.
- Is self-motivated.
- Looks for alternatives.
- Cooperates with others.

- Perseveres.
- Is confident and has a positive self image.
- Is resourceful.
- Is able to see where they are and to move forward.
- Is not dogmatic.
- Is aware and sensitive to their own life experiences.
- Has a sense of humor.
- Validates the experiences of others.
- Recognizes and acknowledges the learning styles of others.*

(*This list of attributes was generated during SYEFEST Leadership Workshop II, 1995)

What Is Involved in Modeling Professional Practice?

In modeling profession practice as you lead your SYE Institute, you will find yourself grappling with some very critical tensions that face any teacher in creating a supportive and stimulating environment for learning. One of the most effective forms of modeling, in fact, is to share with your participants how you've thought about and sought to address these same tensions they face every day. These tensions include:

Creating a safe and supportive atmosphere while pushing learners to and beyond the edge of learning. This is especially hard in science, where all understanding is socially constructed and where authority is socially defined. Thus, a group that hasn't chosen to open its knowledge-generating process to outside scientific authority can construct wrong interpretations of the world. It also comes up in terms of what kinds of assessment activities are included in a professional development program for teachers that doesn't involve grades and credit. For example, if you opt to leave assessment out of your SYE Institute completely, you are modeling instruction that does not focus on standards and does not provide feedback to the student or the leader.

Using shortcuts effectively. Consider the question, "If your ideal practice for teachers working with their students is for them to craft a two week unit on a single topic, why aren't you modeling precisely that in your two week summer institute?" Surely, we hope that our teachers will be able to do and plan more with their students than precisely what they experience in the SYE Institute. But how much more, and how can we help them do this? Even more specifically, can we model this in our work with them, too?

Teaching fewer topics in depth while satisfying diverse learners (teachers) with diverse needs. When we are enthusiastic about our subject and anxious for our students to learn, we have a tendency to try to cover too much, too quickly. Witness the statistic that the average high school biology text has more bolded words (important concepts) than students are expected to learn in the average high school foreign language class. Add to this the fact that you will be working with 10-15 teachers, each with their own personal interests and curricular needs and constraints. And yet we know from an abundance of research and practical experience in education that students - be they kindergartners or sixth grade teachers - learn best when fewer topics are explored in greater depth and from a diversity of angles or perspectives. How you resolve this tension in crafting your workshop will provide an extremely important model for your teachers in their work with kids.

Addressing the conceptual and skills challenges specific to the subject matter while also addressing the teaching and learning challenges at hand. Teachers face this challenge all the time. They need to know about the subject at hand, and also about how their students learn. As is pointed out in many places in this Handbook, SYEFEST addressed this tension at the leadership level by working with teams comprised of a master teacher and a practicing ecologist as a

co-leaders. Teachers, themselves, and many potential leaders of SYE Institutes, don't have this option. How can they effectively model respect and attention to both arenas in their work? This challenge involves striking a blend of the "interactive" and "expert" models of teacher professional development (Sprinthall et al., 1996) and can be achieved by forming communities of mutual respect based on the Lead Scientists' and Lead Teachers' different areas of expertise and experience. By seeing the Lead Teacher and Lead Scientist interact on equal ground, teachers can identify with the expertise that educators brought to the partnership.

Maintaining a unified flow, atmosphere, and style while still taking advantage of a diversity of resource people.

Again, teachers face this challenge all the time. The problems of multi-leader courses are legion, as are the difficulties of finding outside people whose teaching philosophy and approach coincide and yours, and to get them to actually do it the way you would like. When delving into topics in which they don't feel sufficiently well versed, all teachers look for outside "experts." You might choose to do this in your SYE Institute, too. Certainly, it is helpful for teachers to learn about specific resource people they can call on later. But how you make use of these people during your Institute can be as important as a model for bringing in outside people as it can be for the actual contact made.

Teaching ideas or teaching applications, teaching inside or teaching outside. These are related tradeoffs or tensions. You want learning about ideas and the ability to apply ideas to the real world outside the classroom walls. You want learning about systems beyond the neighborhood, but about the neighborhood, too. The challenge comes in deciding how to mesh what can otherwise be conflicting goals.



What Is The Value of a Teacher/Scientist Team in Modeling Professional Practice?

The first strategy described in the following section is to use a team leadership model in which a professional scientist and a practicing teacher are equal players throughout the planning and implementation of an Institute. We've included this strategy in Chapter 1 because:

- It is perhaps the most important single strategy to emerge from the SYEFEST experience, and therefore belongs first. The value of this strategy includes direct benefits to the teacher participants, and indirect benefits to the leaders themselves (see [Further and Deeper](#) for the latter).
- Although it plays out in the topics covered in all the chapters, establishing equality within the team is one of the foremost concerns in "modeling" professional practice - where science and education are given equal weight and are represented by committed and trained practitioners in the respective fields.

In the leadership teams, the lead scientist's primary role is to stimulate and model scientific thinking and questioning. Through her or his example, gentle prodding and support, teachers are encouraged to develop their own ideas for schoolyard inquiries. The scientist continually reinforces the idea that the process of inquiring leads to the development of knowledge, and helps validate the importance of outdoor inquiry-based teaching. By interacting with a scientist, teachers' views of the nature of scientific knowledge grow from perceiving science as a rigid set of procedures and facts (Kennedy, 1991), to understanding that science is a discipline with uncertainties and room for human innovation and debate. One of the Lead Scientists articulated this goal in a discussion with teachers as follows: "Part of science is knowing and another part is questioning when we don't know things. It's like solving a mystery, collecting quality evidence. How we deal with the uncertainty is critical because knowledge is relative, and many questions can't be answered. Kids need to know this, to experience this, and be comfortable with this."

I was able to fill a missing link between the college professor level and the school classroom. I have found that as I encourage other teachers to use the inquiry/investigative method in their classrooms, that I continue to improve my skills and develop new ideas for use in my own classroom.

*Sallie Burn
Lead Teacher*

We expected that teachers would gain greater insight into teaching schoolyard ecology by engaging in a knowledge construction process as a community along with scientists. Our intent was for each lead scientist to act as a true partner in knowledge development with workshop participants, rather than as a visiting specialist with a fount of knowledge. Yet the scientists did not downplay their expertise, especially given that many teachers were eager to tap their extensive knowledge. Indeed, their knowledge of local natural history and ecology was crucial to the success of the workshops.

The Lead Teacher's role is to be a model for enthusiastic schoolyard inquiry. She or he helps teachers connect their experiences to the experiences of children and the realities of schools, and makes sure that the workshops are attuned to the needs and strengths of students and teachers. Having a local teacher co-lead the workshops

also makes it possible to establish a connection to school districts' ongoing professional development plans.

For example, the Oxford, GA SYEFEST site ([link](#)) had been running natural history workshops for teachers for several years before adopting the leadership team model in 1996. Lead Ecologist Eloise Carter reflects:

With the addition of an elementary school teacher as a Lead Teacher in 1996, we directed our work and the activities of the participants towards meeting curriculum goals through investigations. Our teachers benefited from the discussion of integrating cross-curriculum work with schoolyard investigations and the attention to perceived difficulties in managing students in the schoolyard. The Lead Teacher was also a master at modeling how to turn subject matter into questions, and allowing students to pursue those questions.

What the teacher brings to the partnership

- Practical, time-tested skills in inquiry-based, schoolyard ecology teaching.
- Wisdom in how to put together effective workshops.
- Perspective on teachers' backgrounds, interests, and concerns.
- A real and compelling model for teachers to emulate.
- Confidence building and legitimization within the local schools and school district.
- Familiarity with the local and state curriculum.
- Expertise in science pedagogy, innovative assessment and curriculum development.
- Connections to classroom and school resources for teaching.

What the ecologist brings to the partnership

- Up-to-date ecological knowledge.
- Local natural history information.
- A conceptual framework for the discipline of ecology.
- An ecological perspective of the schoolyard.
- A direct connection to other scientists, both locally and nationally.
- A real and accessible model of scientific habits of mind and dispositions.
- Legitimization of the effort (through prestige, recognition, etc.).





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Modeling professional practice as leaders

Strategies

The modeling strategies we describe include:

- Your leadership team as a model.
- Your Institute plan as a model.
- Your personal behavior as a model.



Your Leadership Team as a Model

Form a Lead Teacher/Lead Ecologist team to run your SYEFEST Institute. **You don't have to go it alone!** In fact, you probably shouldn't. One of the clearest results of SYEFEST has been the incredible value of the Lead Teacher/Lead Ecologist Partnership. The benefits start with very tangible ones for the teachers participating in SYE Institutes. But, the benefits don't stop there. In fact, one of the most surprising results of SYEFEST was the universal benefit experience by the lead teachers and lead ecologists themselves. They report that the experience of working together to train teachers in schoolyard ecology dramatically altered the way they teach - from all subjects in an elementary classroom to upper level science at the university level.

Below, Frank Kuserk, Lead Ecologist, Bethlehem, Pa., SYEFEST, provides two articles on how to locate a partner and how to make your partnership work:

"Finding a Partner"

Finding a partner to work with can be a difficult task. It is somewhat ironic that while both Lead Ecologists and Lead Teachers are engaged in essentially the same profession, education, they oftentimes have very little contact with one another. Each is most likely employed at different institutions, they attend different professional meetings, and they travel in different social groups. Isolation between the practitioners of education in the U.S. is the norm rather than the exception. How, then, can teacher/ecologist teams be built?

One common place which can serve as a bridge between the world of elementary and higher education are departments or schools of education at colleges and universities. Colleagues who teach in these departments can be ready sources of contact between ecologists and teachers. Tell them of your interests and ask them to suggest individuals who might be interested in establishing a SYE partnership. Education department faculty also have a good feel about which of their colleagues in the university takes a special interest in teaching. While faculty in higher education do teach, many also are engaged in research or other pursuits that may limit their time and ability to become effective SYE partners. SYE partnerships require intensive efforts by both the Lead Teacher and Lead Ecologist, so both must be honest with themselves and their potential partners about their commitment to the team.

Sometimes elementary school teachers themselves are adjunct faculty at a college or university, teaching a section or two of a science methods class. This presents a unique opportunity, since both members of the team share a common environment. Moreover, these individuals not only have the experience of teaching in an elementary classroom, but they have also might teach courses on how to teach science to elementary school students. Another connection right in the scientist's own backyard might be former students who are now working at local elementary schools.

There are numerous other ways to find SYE partners. Sometimes higher education faculty and elementary school teachers do participate in joint workshops, meetings or other programs. Seeking out these opportunities might not only provide a contact, but it might open you up to new and exciting ideas on teaching. There are several professional organizations such as the National Science Teachers Association (NSTA) and the National Association of Biology Teachers (NABT) (links?) that count as their members both higher education faculty and elementary school teachers. Look to see who in your area belongs to these professional societies. In addition, don't overlook the possibility that your own child's teacher or professor might be an interested SYE partner.

If you belong to an environmental or nature-oriented group such as the local Audubon Society or watershed association, look to establish contacts there. Are there any school teachers or college professors who participate in the groups' activities? You've already established a common interest in ecology, why not expand it into a SYE partnership? Ask the group's leaders if they know of anyone who might be interested. Science fairs are also places that bring teachers and scientists together. Bring your students or volunteer to be a judge at one of these events and see what happens.

Finally, contact elementary school principals or university department heads or deans about potential contacts. It might be easier for ecologists than elementary school teachers to do this, but it is worth your time and effort. Building bridges along the entire educational line is something that is both enjoyable and rewarding.



"Making Your Partnership Work"

Understanding Each Other's Language and Perspectives

Partnering with someone who comes from outside your own discipline or domain can be an exhilarating experience, or it can be an absolute disaster! Collaboration means understanding the other person's language and professional culture. It also means recognizing that there are invisible walls which initially, at least, separate elementary school teachers and professional ecologists and which may prevent them from communicating effectively. For better or worse, the separation between the elementary, secondary and higher education communities creates a hierarchy that is sometimes difficult to overcome. Indeed, the term "higher education" gives the impression that somehow the people involved in this endeavor are somehow "better" or "more important" than those who teach on the rungs below. Needless to say, however, this can be a major impediment to establishing a good partnership. From the beginning, the relationship between Lead Teachers and Lead Ecologists must be one of mutual respect and understanding as to what each brings to the team. Ecologists, in particular, must be cognizant of the fact that they are likely to be seen as being the "dominant" or "expert" partner and take steps to overcome this, for while they are most likely the team member with the greater "content knowledge," their teacher-partner is the one who is more likely to possess the necessary "pedagogy knowledge" on how to effectively teach others.

One of the many benefits of opening up to the other person's point of view is that one can bring a fresh perspective to your own teaching. Both Lead Teachers and Lead Ecologists have overwhelmingly told of their new insights which they have obtained. Ecologists, in particular, have been quick to point out how differently they now view their own role as an educator and how participating in SYEFEST has improved the courses which they teach.

Making the Most Out of Planning Time

One of the many characteristics of teachers is that they are busy people. There are lectures and lessons to prepare, papers to grade, and meetings to attend. And, of course home life doesn't end! Planning for a SYE Summer Institute takes plenty of time and effort, and trying to find the time to plan effectively can be the most significant challenge that a Lead Teacher/Lead Ecologist team can face.

Typically elementary school teachers are more constrained when it comes to blocking out time to engage in planning. Whereas college and university professors oftentimes will have entire mornings or afternoons, or even entire days in which they might not have a class, teachers generally work every day of the week on a fixed schedule. In addition, before and after school responsibilities may extend that day even further. Thus, most, if not all of the planning that takes place for your SYE Institute will need to occur either in the evening or on weekends.

When planning for a Summer Institute, there are three issues which need to be discussed. First, there the pedagogical issues. What is it that you would like to accomplish with your audience? What ecological principles do you want to concentrate on developing and exploring? How can inquiry learning techniques best be integrated with content knowledge? How can a sense of the scientific process be developed? What is it that you want your participants to come away with immediately and in the long-term? Are both you and your

partner in agreement on these issues or do you have differing views?



Gail and I met twice before the first Leadership Workshop. I sat in her class and observed her teaching science to her 4th graders. THIS was a critical step in my view, for me appreciating her as a professional on her turf and in her context.

*Kathy Winnett-Murray
Lead Ecologist
Hope College*

These are all important issues that need to be discussed before you and your partner get down to the nitty-gritty of preparing a specific agenda. The philosophy behind the SYEFEST approach to ecological education is discussed elsewhere in this manual. What is important to remember is that you and your partner need to devote plenty of time talking about these issues at the beginning of your planning. Understanding one another goes a long way toward establishing an effective partnership.

The second issue focuses on developing specific activities that participants will do that accomplish the goals which you have set forth. Make sure that the activities you have planned can actually be accomplished at the site you have chosen. A good SYE Institute involves visiting and pursuing activities in the schoolyards of your teacher-participants. You will need to scout these out ahead of time to make

sure that the essential ingredients needed to perform those activities are available. You can't do an exercise on stream ecology without a stream!

Consider how much time should be devoted to each activity and plan accordingly. Develop a specific agenda for each day of your Institute. Make sure that you have allotted sufficient time to perform each of your activities in your daily schedule. Also, make sure that you have a good mix of activities. You will want to have both active "hands-on" activities and more quiet "reflective" moments each day. One of the things that teachers have said over and over again is that it is important to build into your schedule plenty of time in which your participants can develop their own lesson plans to take back with them after your SYE Institute is done. Doing this insures that your teachers have their lessons planned out ahead of time before the busy school year begins!

Finally, you need to plan carefully for all of those things required to make your workshop run smoothly. Taking care of room reservations and transportation needs ahead of time helps you later on. Remember, it's often those little details that can create the right atmosphere! One important suggestion is to schedule a part of your program at the Lead Teacher's school and at your teacher participants' schools. It's too easy to automatically have all of your activities at the college or university site. However, if the purpose of your SYE Institute is to show teachers how to use their own schoolyards, it is far better to perform your activities on real schoolgrounds. Also, by having scheduled days built in at the Lead Teacher's home base reinforces the concept of a true partnership between teachers and ecologists.



Tips for Finding Common Ground While Building on Individual Strengths

While not meant to be an exhaustive list of "do's and don'ts," the following list serves as a way in which to build bridges and strengthen teacher-ecologist partnerships:

- Be honest with your partner and yourself about the time you have available and your level of commitment. Don't underestimate the amount of effort required to put on a SYE Institute.
- Talk about what you can and cannot bring to the partnership. Don't assume that it is the ecologist's job to cover all the content and the teacher's job to talk about teaching tips.
- Work on building bridges with your partner in ways outside your SYE Institute. Assist in an ecology activity with your Lead Teacher's class or lead a discussion on how students learn science in a course taught by your Lead Ecologist.
- Take time to reflect on what you've already done and what you still plan to accomplish. While it may be difficult to find the time to finish all that you've set out to do, make sure that you frequently assess your progress and take pride in what you have already done.
- Help each other gain the respect that they deserve back home. Ecologists need to write letters and speak to their Lead Teacher's superintendent, principal, parent-teacher group and school board members. Teachers need to tell university deans and department chairs about the contributions that their partner is making to the educational community.
- Be flexible and open to new ideas and ways of approaching a task. You'll be surprised at just how much you'll learn!
- Finally, take time to relax and have fun. Be sure to congratulate your partner and yourself for your hard work. You both deserve it!



I am doing and planning much more for inquiry learning and am able to articulate the ideas and philosophies behind them. I find that my students really like doing these things and, best of all, they feel that learning in this way will better prepare them for a world in which problem solving, and not just content learning, is what is really valued.

*Sharon Ohlhorst
Lead Ecologist
Utah State University*

Your Institute Plan as a Model

Think of your overall plan for the Institute - recruitment, pre-program activities, summer workshop, assessment and feedback component, follow-up and beyond - as a model for teachers to follow. In crafting your plan, try to make the hard choices underlying the tensions described in the Background and Rationale section above. (links) Specifically:

- Choose fewer topics and cover them in greater depth. (Chapter 1)
- Be careful how you bring in outside resource people who do not share your teaching philosophy, who might not model the behaviors you prize, and who will not have the same quality of relationship with your participants. (Chapter 7)
- Plan on spending a considerable amount of time outdoors, on schoolyards (as opposed to field trips to "natural areas," or watching videos or other indoor activities). (Chapter 3)
- Articulate your intended outcomes for teacher participants and be clear how the planned activity and sequence relates to these outcomes. (Chapter 9)
- Make sure you include frequent and diverse means of assessing your teachers' learning and achievement, and that you build in ways to give them feedback about their growth and yourselves feedback for program improvement. (Chapter 9)
- Plan to follow through with your teachers during the school year, continuing to model professional practice in your partnership with them, and your work with their students. (Chapter 8)

Your Personal Behavior as a Model

Practice what you aspire for in your teachers, specifically:

- Identify and uphold high standards
- Be an inquiry-based leader
- Be an outdoor, all-weather teacher
- Be a reflective practitioner about science and its nature
- teaching and its underpinnings
- Be flexible and responsive to your students
- Model a schoolyard environmental ethic
- Be enthusiastic



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Further & Deeper

Benefits of the Leadership Team Model to Leaders

Virtually every Lead Teacher and Lead Scientist involved in SYEFEST commented on the tremendous value of their leadership team not only in the success of their work with teachers, but also as a stimulus for professional growth on their own part. Indeed, for many, the collegial aspect of working in a team was one of most positive aspects of their participation. These outcomes were somewhat surprising, with both scientists and teachers reporting significant improvements in their own teaching and in their professional capacity as leaders of education innovation.



Benefits to Scientists' Teaching and Involvement in Education Reform

Frank Kuserk, the Lead Ecologist from the Bethlehem, PA SYEFEST, conducted a survey of Lead Ecologists to gauge how their participation had influenced their teaching. A brief summary of the results is shown [\[CANDACE: this is the material from the ESA meeting that I faxed last week\]](#) We need to make a popup page out of what Kerry typed in here from Frank K.

One Lead Ecologist commented, "I have definitely de-emphasized lecture and tried to incorporate constructivist methods into both my undergraduate and graduate courses. This has been a challenge and a risk (in teaching evaluations) but I am starting to really see benefits now. I'll never go back to 'sage on the stage' now."

Benefits to Teachers' Teaching and Professional Development

Lead Teachers report that by working closely with a practicing scientist to run SYE Institutes, they:

- changed their teaching
- felt more knowledgeable about inquiry teaching
- ended up spending more time teaching outside than they had before
- had enhanced self respect
- were more confident and enthusiastic about teaching science
- were much more involved in other education reform activities in their schools and districts
- had a more positive view of the scientific community
- developed new contacts within the scientific community beyond their Lead Ecologist partner.



Alternatives to the Leadership Team model

Not everyone who wants to run a SYE Institute will be able to find a partner for a Leadership Team as was done in SYEFEST. Since this is beyond the direct experience upon which this Handbook is based, we can only reflect on what we think some of the challenges might be. Perhaps most importantly, having to lead alone a professional development program for teachers in inquiry-based ecology will stretch any one person's breadth of expertise. In response, the leader might choose to rely more heavily on outside resource people, or upon a narrower set of curriculum materials or instructional programs. This will require careful consideration of the tenets of effective modeling and professional practice as discussed in the Background and elsewhere in the Handbook. Some key challenges are likely to be:



- -bringing cutting edge science knowledge and inquiry if a committed ecologist with compatible personality and philosophy cannot be found
- -bringing classroom reality and cutting edge educational expertise if a committed teacher is not involved in leading the institute
- -having too many outside instructors and thereby losing the continuity of philosophy and purpose provided by the leader
- -relying on a set curriculum and program, and thereby limiting the kinds of inquiries and instruction that participating teachers do.

Limits to Modeling Professional Practice

We don't pretend that modeling of professional practice is a panacea for leaders. Here are some reflections on what we've found most challenging or limiting to the value of modeling in our work with teachers. We are very interested in your thoughts, too, and hope you will share them in the forum on [Modeling of Professional Practice](#).

- The most persistent limit to modeling is simply how difficult it really is to do. As discussed in the Background section, it is easy to over-load an agenda and try to talk through activities and topics rather than paying attention to how the diverse set of learners - the teachers - are actually assimilating what is being "covered."
- All of us make mistakes in our teaching, including leaders of professional development workshops. Recognizing, rectifying and coping with these errors is one of the most difficult challenges for modeling.





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Links & Resources

References about professional development:

- The Eisenhower Regional Alliance for Mathematics, Science and Technology Education Reform supports K-12 mathematics, science, and technology (MST) reform efforts in the Northeast and Islands Region. Coordinated by [TERC](#) and funded by the U.S. Department of Education, the [Regional Alliance](#) has an excellent web page about professional development. Their contact information is as follows:
2067 Massachusetts Avenue
Cambridge, MA 02140
PHONE: 617-547-0430
FAX: 617-349-3535
E-MAIL: alliance@terc.edu
- The [North Central Regional Educational Laboratory](#) is another Eisenhower supported program with an excellent web site on professional development:
1900 Spring Road, Suite 300
Oak Brook, IL 60523-1480
Phone: 630-571-4700 or 800-356-2735
Fax: 630-571-4716
E-mail: info@ncrel.org
- [Center for the Development of Teaching](#)
- [National Center for Improving Student Learning & Achievement in Mathematics & Science](#)
- [NISE Publications of the Professional Development Team](#)
- [NISE-Related Publications of the Professional Development Team](#)
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