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Creating a Knowledge Base for Teaching: A Conversation with James Stigler

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James Stigler discusses how we can improve professional development by helping teachers learn to analyze classroom practices and accumulate professional knowledge.



A professor of psychology at the University of California-Los Angeles, March 2002

James Stigler directed the now famous video component of the Third International Mathematics and Science Study (TIMSS). Funded by the U.S. Department of Education, this study compared 8th grade mathematics instruction in the United States, Germany, and Japan. With coauthor James Hiebert, Stigler wrote about the implications of the TIMSS findings in his 1999 book *The Teaching Gap: Best Ideas from the World's Teachers for Improving Education in the Classroom* (Free Press).

In 1998, Stigler founded LessonLab, a company that archives videotaped classroom lessons and teaching materials. LessonLab provides educators with an online library of teaching methods and a forum for discussing instructional practices. Stigler spoke with *Educational Leadership* about his ideas for improving professional development for educators.

How is our concept of effective professional development changing?

Over the past 5–10 years, professional development has changed a lot. The standards movement has created a real need for teacher learning, so people are looking critically at the kinds of learning experiences we're providing for teachers.

Today, people believe that professional development should be targeted and directly related to teachers' practice. It should be site-based and long-term. It should be ongoing—part of a teacher's workweek, not something that's tacked on. And it should be curriculum-based, to the extent possible, so that it helps teachers help their students master the curriculum at a higher level.

How would you describe past professional development practices?

Professional development has been largely divorced from practice, often taking place outside of schools—at a hotel or a university. It's been generic because the people providing professional development have created programs to work for all teachers, no matter what curriculum they're using. It's been haphazard, with many small service providers delivering idiosyncratic kinds of professional development.

It has not been research-based, for the most part. And when people do collect data about whether professional development works, the data indicate that most professional development doesn't really help teachers or students learn more.

What do teachers need to learn from professional development?

Teachers need to learn three things to expand their power in the classroom. First, they need to learn how to analyze practice—both other teachers' practice and their own. By “analyze,” I mean that they need to think about the relationship between teaching and learning in a cause-and-effect kind of way. So if a particular student isn't learning, the teacher can generate a hypothesis that links back to the instruction.

That kind of analysis hasn't been a part of many professional development programs—almost none. The programs are leaving things implicit that should be made explicit. Teachers not only need the opportunity to do that kind of analysis, but they also need guidance in how to do it.

Second, teachers need to be exposed to alternatives. That poses a challenge. We've learned from our TIMSS video studies that there's less variation in U.S. teaching practices than you might expect, so if you want to find truly new ways of teaching, you have to go out and seek them.

Third, teachers need judgment to know when to employ which method. That judgment is based on analysis and looking at alternative practices. Teaching is so complex. There's not one teaching practice that's always the best thing to do; it depends on the situation.

What is your vision for a better form of professional development? What would you consider a "high-quality program"?

A good example is a lesson-study program, in which teachers get together to plan instruction, to observe what happens when it's implemented, to analyze what went wrong, to come up with ideas for improving it, and to try doing it again in their classrooms. This is a popular idea now. There are many different kinds of programs; they're not all the same. Teachers who are participating in these programs tend to find them very valuable. And once they find them valuable, suddenly it's not as hard to find the time to do them.

Do U.S. teachers need to overcome reluctance to participate in these collaborative activities?

Yes, they do. But many teachers are doing that. Then other teachers notice, and soon they want to be part of it, too.

The focus on collaboration is a shift from making teaching completely private to realizing how much you can learn by letting your teaching be public and talking about it with your colleagues. It's scary, but the value is instantly apparent to teachers who do it.

What other challenges do we need to overcome to improve professional development practices?

First, we're lacking a few prerequisites for professional development. The most important one is a knowledge base for the teaching profession. Individual teachers learn from their experience all the time, but there is no mechanism for them to share what they've learned with the profession as a whole, no way of accumulating professional knowledge.

We've relied too much on academic researchers to generate this knowledge base, and they can't do it alone. A lot of research is not designed to solve problems of classroom practice. We need to find ways of learning from our most successful teachers. That to me is the most promising approach.

Second, we need to create contexts in which collaborative work can be sustained. Some people think of it as a matter of "finding time"—but it's also a matter of having a program that teachers consider valuable and being able to integrate that program into the daily routines of school life over the long term.

Third, many things that teachers need to do, such as learn how to analyze practice, are not activities that we have a tradition of doing in the United States. So not only do we need to implement high-quality programs, but we also need to give teachers the opportunity to learn how to participate in these programs. That's going to take time.

How could we create a knowledge base for teaching?

At LessonLab, we've been thinking about how teachers could create a knowledge base that's truly helpful for teachers. Unless we can do that, we're never going to be on the road to long-term improvement because each new generation of teachers will have to start from scratch.

Over the next 10–20 years, we need to collect knowledge that is organized in accordance with standards and curriculum because that's how teachers need to access it. We need to collect videotaped lessons and teaching aids—probably in digital libraries, as we're doing at LessonLab—and provide this information online.

Ideally, wouldn't that knowledge base be centralized so that it could be shared by the whole country, or even internationally?

That's the vision of LessonLab. If we're waiting for the federal government to establish a national database, it's not going to happen. It won't be legislated into existence—and I'm not even sure that it should because I think it should result from teachers' sharing their work with one another.

What's more feasible is to build a platform where teachers can store their own knowledge, share it with their colleagues, and then begin to gather contributions from various places across the United States. These databases will be built by teachers, local districts, and states creating these knowledge bases in a format that can be shared easily.

Why is it important to have a video component? What are the advantages?

Teaching is a performance; it's not something that's represented on paper. It occurs in real time, in a real classroom, with real students. If you want to improve teaching, you need to find ways of studying the

process. Video is the best way of representing that process so that you can study it. You could observe live classrooms—that's an important experience, and we should keep doing it—but video allows you to come back, observe the lesson with a group, talk about it, analyze it, and do the kind of work that can actually improve your teaching.

There's just no better way. Here's the evidence that you need video: Go on the Internet and search for lesson plans—you'll find thousands. Read those lesson plans and you'll realize that most of the important things about teaching are not represented in those plans. They're represented in what actually happens during the lesson. You could take any lesson plan off the Internet and you could implement it in a really powerful, effective way, or you could implement it in a very deficient way. That is the key to good teaching: Some of it is in the written plan, but a lot of it is in the actual performance.

Many teachers have told me that the most valuable part of their own training was that one time when somebody—a supervising teacher, for example—videotaped them and they analyzed the tape together. When that happens in student teaching, it's always memorable. Many teachers report that those are very powerful experiences.

Should teachers contribute only videotapes of classes that they think are exemplary, or should they also use a tape of a class that fell apart or a mediocre example?

Well, it's probably not that useful to watch videos of lessons that are disasters. A lot of things can go wrong in a lesson, and if they all go wrong, there's probably not much to learn from the lesson.

On the other hand, even the greatest teachers make mistakes. Sometimes they'll want to edit those out of the videotape. We believe it's important to leave those mistakes in because they help novice teachers understand that there's not such a huge difference between themselves and the experts. That's an important part of these videos—to show the lesson for what it is—because that authenticity makes it easier to learn from the tape.

In my view, the best database or knowledge base would be one that includes a large variety of examples of different methods, all shown to be effective at least sometimes. That's the way you build a really usable database. I wouldn't worry a lot about which example is the best. If you do, there's too much disagreement.

How is LessonLab being used now?

We launched the software platform in July, and we already have 31 active projects going on across the United States. It's exciting to watch what these people are doing. Are they running into trouble? You bet. It's hard. There's so much of a cultural change that's required—just about using technology. A lot of teachers are still afraid of technology.

But we take a long-range view of all this. We're embarking on a 10- to 20-year project. No doubt 20 years from now, a lot of professional development will be done online. It's going to be a fascinating journey to get there.

One finding of TIMSS was that the major differences in teaching among Germany, Japan, and the United States lay more in the quality of the lessons than in the skills of the teachers. Should we focus professional development on improving lessons rather than polishing teachers' skills?

There are three ways to improve the quality of teaching that students experience. One is to improve the applicant pool. You can get better people—smarter people, more charismatic people, more articulate people—to go into teaching. Two, you can try to improve the competence of the people who are in the teaching profession. And three, you can try to improve the methods that teachers use, apart from the teachers who are delivering them.

The way that I listed those approaches is the order of importance that we've attached to them in the United States. If you look at all that's been written and proposed about improving the quality of teaching—and there's a great emphasis on that now—most of it is about retention and recruitment. It's about how to get better people into the classroom. I've seen nothing about improving the methods of teaching. That doesn't seem to figure into our priorities at all.

We've got those approaches upside-down. We should attach the most importance to improving our teaching methods. Most students are taught by an average teacher, implementing the average method. If we can find a way to make that average method a little bit better, that's going to have a big effect. After that, we should work on building the competence of teachers. In TIMSS, however, we saw a lot of teachers who seemed very competent implementing a limited method—so just improving their competence, while they continue to use the same method, isn't going to do it.

Is there resistance in the United States to determining a standard method of teaching because we have an individualistic outlook, or is that overstated?

Yes, there is resistance. People in teaching take the mistaken view that “if I just do the standard practice, then I'm not being a professional. I need to do something new, unique, creative.” Al Shanker used to make this point quite powerfully. He said that what defines a profession is the standard practice. There's

nothing wrong with going out and doing the standard practice, provided that you have a means of improving it over time.

In medicine, if you don't follow the standard practice, they have a word for that: malpractice. Whereas in teaching, somehow we've promulgated the idea that a teacher is not a professional unless she invents it all by herself. In fact, it's just the opposite. A profession is defined by a knowledge base, which allows the profession to improve its practices over time.

If you look at medicine over the past 100 years, it's changed greatly—not because smarter people have become doctors, but because we've found a way to accumulate and share knowledge in the profession and to keep updating it over time. The lack of a knowledge base is exactly why teaching has not changed much over the past 100 years.

And there's still room for creativity, even if you are following standard practice.

Of course there is. Is a violinist who's playing a Mozart concerto really tied down by playing the same old piece that everybody else plays? In education, we've expected too much from teachers. We've expected them not only to play the violin but also to write the concerto, and if they don't do that, we imply that they're not exercising their creativity. But in fact, we've got our definition of creativity wrong.

From your experience, what helps site-based professional development flourish over time?

First, you need a strong principal and a strong superintendent who supports the principal. Second, you need to focus on the end result. If you're trying to improve student learning, keep everything focused on student learning, not on changing practice so much—although practice will change.

Third, maintain a focus over time. In Japan, for example, lesson study groups form as part of schoolwide improvement programs that generally go in three-year cycles. A school will get together and say, "What is our biggest problem? What are we going to focus on?" And they may decide, "We're going to focus on algebra concepts that are linked to passing the high school exit exam." Then, they'll do that for three years and not waver.

Persistence goes hand in hand with leadership. If you persist, then you see the results of what you're doing, and there's nothing that helps build sustainable practice like seeing results. On the other hand, many excellent site-based programs fall apart when the principal leaves because the new principal comes in with a new agenda. It's hard to maintain focus over time if you don't have strong, long-term leadership.

How will the accountability movement affect professional development?

In the long run, it's going to have an excellent effect on professional development because it creates a context in which everyone is really motivated to improve. On the other hand, there will be lots of glitches. Right now, for example, the alignment between the standards and the assessments isn't well set. Teachers have to focus more on the tests because that's what they're being held accountable for. So we are ignoring some important parts of our standards. We will have growing pains as we go through this big change toward standards-based education. But in the long run, standards are going to be very good for professional development.

Another reason the standards movement is good is that it means all teachers in a state—within a grade level or subject area—are sharing the same learning goals for their students, which gives them a much richer basis for sharing the professional knowledge that can help them improve. If everybody's teaching different things, it's much more difficult to share professional knowledge.

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