

Improving The Instructional Core

Richard F. Elmore
Harvard University
Graduate School of Education

Without a Thou, there is no I evolving. Without an it, there is no content for the context, no figure, no heat, but only an affair of mirrors confronting each other.

--David Hawkins, "I, Thou, and It."

There are only three ways to improve student learning at scale:

You can raise the level of the content that students are taught. You can increase the skill and knowledge that teachers bring to the teaching of that content. And you can increase the level of students' active learning of the content. That's it. Everything else is instrumental. That is, everything that's *not* in the instructional core can only affect student learning and performance by, in some way, influencing what goes on *inside* the core. Schools don't improve through political and managerial incantation; they improve through the complex and demanding work of teaching and learning.

What about content and performance standards? Standards only operate by influencing the level of the content that's actually being taught; their effect in actual classrooms depends on whether there are materials that reflect the standards, whether teachers know how to teach what the materials and standards require, and whether students find the work that they are being asked to do worthwhile and engaging. What about professional development? Professional development works, if it works at all, by influencing what teachers *do*, not by influencing what they think they ought to do, or what the professional developers think teachers ought to do. The quality and impact of professional development depends on what teachers are being asked to learn, how they are learning it, and whether they can make the practices they are being asked to try work in their classrooms. What about supervision, evaluation, and strong instructional leadership? Administrators' influence on the quality and effectiveness of classroom instruction is determined *not* by the leadership practices they manifest, but by the way those practices influence the knowledge and skill of teachers, the level of work in classrooms, and level of active learning by students. Most of what well-intentioned policy

makers and administrators do in the name of school improvement never actually reaches the instructional core. Much of it doesn't even reach the classroom. Our best ideas about policy and management don't cause student learning to increase. At the very best, when they are working well, they *create conditions* that influence what goes on inside the instructional core. The primary work of schooling occurs inside classrooms, *not* in the organizations and institutions that surround the classroom.

So the **first principle** of instructional improvement is that *increases in student learning occur only as a consequence of improvements in the level of content, teachers' knowledge and skill, and student engagement*. The **second principle** follows from the first: *If you change any single element of the instructional core, you have to change the other two*. If you raise the level of content without changing the level of knowledge and skill that teachers bring to the content, you get what we see with considerable frequency in American classrooms: low-level teaching of high-level content. Teachers assign high-level text or complex problems, and then structure student learning around fill-in-the-blank worksheets, or walk students through a straight procedural explanation of how to find the answer, leaving the students in the role of recording what the teacher says. If you raise the level of content *and* the knowledge and skill of teachers without changing the role of the student in the instructional process, you get another version of what we see with some frequency in American classrooms: Teachers are doing all, or most, of the work, exercising considerable flair and control in the classroom, and students are sitting passively watching the teacher perform. A common student question in these classrooms is, "Teacher, should I write this down?" If you raise the level of teachers' knowledge and skill in general pedagogy without anchoring it in content, you get high-level practice disconnected from a clear understanding of what students are actually learning, and from the specific issues that students have with specific cognitive tasks. This is what David Hawkins means when he says, "*Without an it, there is no content for the context, no figure, no heat, but only an affair of mirrors confronting each other.*" We frequently hear teachers talk about "how well the lesson went" without reference to what students were actually doing and what visible evidence there was of what students actually knew as a consequence of the teaching. Mostly, the lesson has "gone well" when it has gone according to plan, without any specific

reference to what students do or don't know as a consequence of the teaching. Intervening on any single axis of the instructional core means that you have to intervene on the other two in order to have a predictable effect on student learning.

Americans are much more comfortable talking about changing content and teaching than they are about changing the role of the student in the instructional process. We focus much more attention on textbook adoptions and curriculum alignment, for example, than we do on analyzing students' actual responses to the content we think they ought to learn and their actual role in the instructional process. In the more advanced strategies of improvement, we focus attention on helping teachers get familiar with new content and pedagogy, but we focus relatively little attention on what students are doing when they are actively engaged in learning what we think they should learn. This is one big difference I see between American schools and the schools I visit in other countries. Here we spend a great deal of time worrying about *what* we're teaching and *how* it is being taught. In other places, I notice that people also spend a great deal of time worrying about *whether* students are actually interested in, actively engaged in, and able to explain how they think about what adults are trying to teach them. There are differences between elementary schools and secondary schools in the U.S. on this score. It is much more common, although still not the dominant practice, in U.S. elementary schools for teachers to pay attention to whether students are actually interested in and engaged with learning. In secondary schools, it is very rare to find classrooms in which teachers are actually interested in how students understand or engage in the learning they are being asked to do. Most of the instruction I observe in secondary schools is about "delivering" the content, and, most importantly, about deciding which students are smart and which are "deserving" of further attainment. The culture of American schools, in its deep structure, is very teacher-centric. You only see the magnitude of this when you step outside the culture. We tend to focus more on what the teacher is doing in front of the classroom than we do on the work that is actually on top of the student's desk. More about this later.

The instructional core provides a heuristic for assessing the likelihood that any systemic improvement strategy, or any particular change in policy or practice, will actually result in any real improvement in student learning. "We're doing formative assessment;" yes, but

how will your investment in the technology of assessment influence teachers' knowledge and skill, the level of content you expect to see in the classroom, and the role of the student in the instructional process. "We're focusing on developing strong instructional leaders;" yes, but what is the actual practice that you're asking leaders to engage in that will lead to improvements in content, knowledge and skill, and student engagement? "We're adopting a new, more challenging math curriculum;" yes, but how would you know whether the instructional practice on which the curriculum is predicated is actually occurring in classrooms, and with what level of depth and consistency? In general, a good rule for the design of large-scale improvement strategies is the **third principle**: *If you can't see it in the core, it's not there.* It doesn't matter how much money you've spent on it, it doesn't even really matter whether everyone thinks it's the best thing since sliced bread (since many people like best those changes that make the least demand on them), and, above all, it doesn't matter whether everyone else is doing it. What matters is whether you can see it in the core. If you can't, it's not there.

The instructional core also helps us predict what we would expect to see happening to student learning over time. Here the central idea is *the academic task*. Let me illustrate with an actual case that occurred in our work with superintendents on instructional improvement. Our superintendents' network was doing a school visit in one network member's district. This was a particularly thoughtful and active superintendent who had managed to make quite a lot happen instructionally in his district in a relatively short period of time. In our visit, we broke into groups of three or four, and did a series of rotations through classrooms, with two groups seeing each of four classrooms at a given grade level for a period of time. We then observed the team meeting of the teachers in the grade level whose classrooms we had observed. So, essentially, we saw the instruction in each classroom and then we saw the teachers talking about the instruction in their team meeting. Because the district and the school had worked hard on curriculum alignment, the teachers were able to talk about a common lesson sequence they were teaching and about the work that students were producing in that sequence, according to a common assessment that all the teachers were using. As I said, this is a rather sophisticated system.

In the course of the team meeting a problem emerged. The student work was obviously quite variable from

classroom to classroom. In one classroom in particular where there were a number of students whose assessment results suggested that they apparently did not understand the content. The team leader asked the teachers what they thought explained the differences among classrooms. Each teacher offered an explanation. The explanations had mainly to do with teachers' interpretations of what students' skill levels were at the beginning of the unit. That is, the teachers felt that students who were struggling with the content had weak prior learning. So the discussion quickly shifted to what kind of remedial strategies one might use to bring those students up to the desired level.

What the teachers didn't know—because they had never observed each other teaching—was that the *actual work* that we observed students doing, within a nominally common curriculum framework, was quite different in each of the four classrooms. And the level of the student work that was presented at the grade-level meeting was quite close to the actual work that students were being asked to do in each classroom. In other words, the variability in student performance was a result of the teaching that was going on, *not*, as the teachers hypothesized, a result of the students' prior knowledge. This was yet more evidence for Elmore's Third Law—hold onto your hats—*teaching causes learning*.¹ The team leader, whose students produced the most consistently high-level work, in the absence of direct evidence on what her colleagues were doing, was projecting her own practice onto the practice of the other teachers on the team, and that led her to suggest that the variability couldn't be the result of differences in teaching, since "we're all teaching the same thing." In fact, they weren't.

What was different in the four classrooms was what students were actually being asked to do, and the degree to which the teacher was able to engage students in the work by scaffolding their learning up to the complexity of the task she was asking them to do. The curriculum was the same, the tasks were different. In one classroom, the teacher took twenty minutes of the 55-minute period explaining the task and directing students through a detailed procedural drill on what to do. The instructions were so complex that most students (and observers) couldn't

¹ Elmore's First Law: Students generally do better on tests they can read than those they can't. Elmore's Second Law: The impact of professional development on student and teacher learning is inverse to the square of its distance from the classroom.

repeat them when they were released to work on their own. In another classroom, the teacher focused very little time on setting up the task, passed out the materials, and asked students to work individually on the task and to consult other students in their group if they got stuck. In yet another classroom, the teacher passed out the task, assigned roles to students at tables, and then circulated through the room answering individual students' questions. In the team leader's classroom, the teacher spent less than five minutes reminding the students of how the task they were about to do was connected to the previous day's work, and asked students what they had learned from that work, and then she spent about five minutes walking students through a discussion of a model task that was similar to the one they were being asked to do. She then put students in groups, assigned roles, and circulated through the room. When we asked students in the first three classrooms what they were working on, none of them could reliably describe the task. When we asked students in the fourth classroom, they could reliably tell us what they were expected to do and tell us how it was connected to what they had done earlier.

It is important to add here that students in all four classrooms were "engaged," by conventional definitions—that is, they were attentive, non-disruptive, and compliant. If you were doing a windshield survey of classroom climate in this school, with the typical supervisory checklist, you would see, without exception, classrooms that were quiet, orderly, and in which the teachers had done everything that the external environment expected of them. The "Do Now" was in the upper left hand corner of the whiteboard; the specific objective of the day was prominently displayed, referenced to the appropriate state standard; the "Students Will Be Able to Do" was adjacent to the standard. If you stayed at the surface-level characteristics of the classroom, you would predict that students were all getting access to the same work.

But in reality students were engaged in very different levels of work in different classrooms around a common curriculum unit. In the classroom where students were explicitly drawing on prior knowledge about how to address the task and where they had experience working individually and in groups, not surprisingly, they were relatively competent at doing what the teacher expected them to do, and they did it at a relatively high level. The teacher was free to work with individual students who were struggling with the task. In classrooms where the teacher

was the main source of information on the task, and the teacher's practice at setting up the task was disconnected from the students' understanding of how to address the task as well as the actual work embedded in the task, not surprisingly, students were confused about the task and variable in their engagement with it. In my experience, the latter situation is much more common than the former in American schools. My favorite question to ask students during an observations is, "what's going on here?" The most frequent response is, "I don't know," or "Ask the teacher, she knows."

The **fourth principle**, then, is that *the task predicts performance*. What determines what students know and are able to do is not what the curriculum says they are supposed to do, nor even what the teacher thinks he or she is asking students to do. What predicts performance is *what students are actually doing*. The single biggest observational discipline we have to teach people in our networks is to look on top of the desk, rather than at the teacher in front of the room. The only way to find out what students are actually doing is to observe what they are doing, not, unfortunately, to ask teachers what students have done after the fact, and even less to look at the results of student work after they have engaged in the task. What was interesting about our observation was that for a brief moment, for this particular task, we, the observers, actually knew more about what was going on in these classrooms than the teachers did. This is an unsettling commentary on the instructional culture of American schooling.

Walter Doyle, from whom we have drawn most of our understanding of the nature of academic work, says:

Accountability drives the task system in the classroom. As a result, students are especially sensitive to cues that signal accountability or define how tasks are to be accomplished. In addition, students tend to take seriously only that work for which they are held accountable. (Doyle, 185-186)

The accountability problem in the classroom is a microcosm of the accountability problem in the broader system. Other things being equal, people tend to want to do what they are expected to do in complex social systems with interlocking expectations. But in order to do what they are expected to do, they must know not only *what* they are expected to do but also *how* they are expected to do it, and what *knowledge*

and skill they need in order to learn how. This is the distinction that Nobel economist Thomas Schelling makes between, "doing the right thing, and knowing the right thing to do." When we put teachers and students in situations where the task is vague and unspecified, but the expectations for performance are specific and high, we are expecting them to do the right thing without knowing the right thing to do. Students in three of the classrooms we observed that day were dutifully doing what they thought the teacher expected them to do, without knowing either what they were actually supposed to do, or, more importantly *why* they should *want* to do it. Students in the fourth classroom had discussed how the task was related to the previous day's work, what they had learned from that work, and had seen and discussed a version of the task with the teacher, *before* they were asked to work independently and in groups on the task. It was also clear from the way they worked that they were familiar with this routine. Notice also that the practice of the team leader did not trickle into the classrooms of the other teachers at her grade level; the culture of autonomous practice guaranteed that.

This connection between doing the right thing and knowing the right thing to do leads to the ***fifth principle***: *The real accountability system is in the tasks that students are asked to do.* From a policy and managerial perspective, we tend to think of accountability as systemic issue. Accountability, in this view, is the way we steer the system toward a good collective result, using performance measures, standards, rewards, and sanctions. From this perspective, we tend to think that if we just get the incentives and structures right, good things will follow. In fact, this view of accountability rests on an heroic, largely unfounded, assumption that students and teachers actually know what to do, that they know how to do it, and, most importantly, that they are able to derive some personal meaning and satisfaction from having done it. If you can't solve this problem of accountability at the classroom level, then the system-level work on accountability is mostly about the manipulation of political and managerial symbols, not about the improvement of learning.

In our experience working with teachers, principals, and system-level administrators around problems of large-scale improvement, people tend to be much more specific about what they expect by way of student performance than they are about what to look for in classrooms that would

lead to the performance they desire. American schools have traditionally had an extraordinarily weak instructional culture, which has led, in turn, to extremely high variability in student performance among classrooms within schools, and to an extremely low capacity to affect instructional practice and student learning at scale. Trying to move performance in a system with a weak instructional culture is like pushing on a string. It doesn't do any good to know that there *is* an instructional core, and that the tasks that students are asked to do within that core are what actually drives student learning, if the core itself is atomized and idiosyncratic from one classroom to another.

This is why I have invested a good deal of my professional energy in building the competence of leaders in schools to observe, analyze, and affect instructional practice. I have deliberately drawn on the medical model in this work, not because I think educators ought to act more like physicians, but because medicine has, in my view, the most powerful social practice for analyzing and understanding its own work—the medical rounds model. 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 and school level. I work with educators on the observation and analysis of teaching practice not because I think it's good for their souls (although it may be), but because I don't think you can change learning and performance at scale without creating a strong, visible, transparent common culture of instructional practice. And I don't think you can create a common culture of practice without actually *engaging* in the practice yourself. I know this is heresy, since most administrators and support staff in schools choose to do what they are doing precisely because they see work in classrooms as too limiting. But this heresy leads to the ***sixth principle***: *We learn to do the work by doing the work. Not by telling other people to do the work, not by having done the work at some time in the past, and not by hiring experts who can act as proxies for our knowledge about how to do the work.* The genius of the medical rounds model is that the profession reproduces its practice, and the surrounding culture, through direct face-to-face interactions around the work. To be sure, there is an ample supply of knowledge that comes from outside sources into the practice of physicians. To be sure, there are strong external controls and incentives

that drive practice in a given direction. But within these external structures and incentives there is nested a social process for inducting people into the practice, for sustaining and developing norms of practice, and for making face-to-face evaluations of practice. The education sector, which is no less knowledge-intensive than medicine at its core, has no such culture-building practice. It should not surprise us, then, that the enterprise is atomized at its core. Education is essentially an occupation trying to be a profession, without a professional practice.

When we work with people to develop their knowledge and practice around the instructional core, they typically ask two questions in the earliest stages of the work: "Can you tell us what high-level instruction looks like?" And, "How do I get people to do it?" People want an immediate framework for judging whether teachers are "doing it," and they want us to tell them how to get people to "do it" who are not currently "doing it." It is my role to disappoint people. I am fairly adamant in resisting answering these questions, to the point that it has become a standing joke in my practice. Why? Because I think people have to engage in sustained description and analysis of instructional practice before they can acquire either the expertise or the authority to judge it, much less to evaluate other people doing it. Most of the educators I work with—understandably, given the pressure they are under—want an immediate short-cut to the answer. You don't build a culture by taking short-cuts. It took over a hundred years to build the current dysfunctional instructional culture of American schools; it won't be transformed by taking a three-day course in supervision and evaluation.

This leads to the **seventh principle**: *Description before analysis, analysis before prediction, prediction before evaluation.* You build a common culture of instruction by focusing on the language that people use to describe what they see, and by, in effect, forcing people to develop a common language over time. Language is culture, and vice versa. When we jump straight from observation to evaluation, we short-circuit the difficult process of developing a common language to use in describing what we see going on in classrooms. In the absence of such a language, what you mean by some key term—student engagement, for example—might be completely different from what I mean by it, and we end up agreeing to disagree because it's too hard to figure out how to

negotiate our differences. In our work, we insist that people develop a strong descriptive language, and that they go through several iterations of a process for developing a common language *before* we move onto the task of analyzing, predicting and evaluating. *Analysis* is getting people to work at grouping what they see into mutually agreed-upon categories and to start to make some judgments about how the categories are related to each other. *Prediction* is learning to use the evidence of observation and the analysis to make causal arguments about what kind of student learning we would expect to see as a consequence of the instruction we have observed. Typically, we ask people, "if you were a student in this classroom, and you did exactly what the teacher expected you to do, what would you know how to do?" This question stems directly from the fourth principle—task predicts performance. Only after people have developed the disciplines of description, analysis, and prediction do we raise the issue of evaluation, and then, we don't raise in the typical form of "was this good teaching or not?" We ask people to address the questions, "what is the next level of work in this classroom, school, or system?" We pose the evaluative question in this way specifically to avoid the superficial classification of practice into "good," "mediocre," and "bad" because we want practitioners to think about the process of improvement as a *clinical practice*, in which our job is to make the practice better over time, *not* to mete out rewards and punishments. There is also an issue of humility involved here. Most of the people who, by virtue of their positional authority, are evaluating teachers, could not themselves do what they are asking teachers to do. Teachers know this. The escalating demands of teaching practice are such that the knowledge and skill required to do the work is beyond both the experience and practical knowledge of the people charged with supervision. Creating a powerful culture of instructional practice in this situation requires supervisors to act as *if* they **don't** know in order to learn what they need to know. My most common advice to principals entering teacher grade-level conferences is, "Turn off your walkie-talkie, sit down, be quiet, and listen for at least ten minutes. Then, the first words out of your mouth should be question to which you do not know the answer."

Only after people have gone through the process of learning how to describe, analyze and predict, do we introduce specific frameworks for evaluating whether what

we see is "high," "medium," or "low" level practice.² Most people experience this process as unmooring, because most of the preconceptions they bring about what they think is "high level" practice actually can't be grounded in strong descriptive language. Having to make strong causal statements about what kind of teaching would produce what kind of learning usually results in considerable tightening and revision of peoples' initial conceptions of what they consider to be strong practice. Another benefit of this discipline is that administrators who have to make decisions about who gets to tell teachers how to teach—consultants, coaches, curriculum developers, etc.—end up asking much tougher questions when they have been through the discipline of observation.

An example will illustrate this process: In our work with a principals' network, we spent about half of the first year of a two-year process focused on the descriptive/analytic phase of the practice. (In my 15-week course on the subject, we spend roughly the first five weeks doing nothing but observing and analyzing video of teaching practice, and each week thereafter involves some form of observation.) In our model, we ask principals whose schools are to be visited to frame a problem of practice that relates to their overall plans for school improvement. It was clear from the beginning that principals were intrigued by classroom structure and process because they thought that if you could just get a more predictable pattern of classroom process going, then you would be better at getting results at scale. So, not surprisingly, what jumped out of the initial observations was a lot of description of group work in classrooms, at the level of "students were sitting in groups doing their assigned work." When we pushed people to be more specific about what they saw and to predict what kind of student learning would result from this observation, they typically lost their traction. They couldn't say exactly what they would expect. So the next time they looked more closely at what students were actually doing in groups, and the general pattern that surfaced was (a now very robust

² My current favorite source on this subject is the Marzano and Kendall book cited at the end of this piece. It is a much more current and powerful formulation of the traditional Bloom's Taxonomy, and it is especially good in its treatment of the "self system," that is, the student's orientation toward the meaning and significance of the learning, and the "metacognitive domain," the student's capacity to reflect and self-monitor learning. It also deals well with the traditional cognitive domain.

finding in our work in schools) that students were largely doing *individual* tasks while seated in groups. The nature of the task didn't seem to have anything to do with the fact that students were seated in groups, and the task itself seemed to be one that students could easily do without much guidance from either the teacher or their peers. In other words, it didn't demand much in the way of cognitive engagement, either individual or collective. So the focus of the network shifted from the structure and organization of classrooms to the actual work that students were being asked to do, and the question shifted from "how is the classroom organized?" to "does the organization of the classroom support the kind of work we expect students to do?" Instead of looking for a particular structure, the principals began looking for the task and hypothesizing the structure that would go with the kind of task they were looking for. From then on, the work of the principals became much more focused on the actual work that students were doing and its relationship to what the administrators and teachers thought they were doing to support student learning.

So how does all this relate to the broader issue of organizing for large-scale improvement? The instruments that the typical state or local jurisdiction has available for school improvement are fairly blunt. You can tighten-up on standards and incentives, raising the level of expected performance. You can clarify the content you expect to be covered at particular grade levels, and adopt curriculum materials to support that. You can fill the system with information about student performance and create the expectation that people will use it to monitor and change their practice. You can provide training and professional development for teachers and administrators, and you can provide support for schools that are going through the process of building higher-level instructional practice. You can release administrative control altogether on the theory that strong performance incentives will guide schools to the right result without guidance and support from the center. The aggregate effect of these measures is that some schools move in the desired direction, some essentially stay where they are in the distribution, which in the current accountability system means moving slightly forward, and, typically, some schools actually continue to get worse against an increasingly challenging standard. This pattern describes what is currently happening in most large urban systems.

In all of the large urban systems in which I am currently working, this pattern is fairly robust. I do not think it is accurate to say that the improvement strategies in these systems have "failed" because they have produced this outcome. I think it is more accurate to say that these improvement strategies have reached the limit of what they can produce with their existing theories of action. In most instances, when people ask me "what more can we do at the system level to foster improvement in schools and classrooms?" my answer is, "don't broaden the work with new initiatives, deepen the work with greater focus on building a strong culture of instructional practice." Most of the low-performing schools in which I work don't need more programs, or even, in most cases, more resources. In fact, part of the problem in these schools is that the presence of external support has actually increased the incoherence of an already incoherent instructional culture. These schools don't need more things to do. In fact, they need to do less with greater focus. They need a more powerful, coherent culture of instructional practice.

The pattern of improvement that we're getting in the aggregate with our existing improvement strategies is a direct consequence of a chronically weak instructional culture. When you push hard on an essentially atomized culture with a strong set of external forces, you get a more atomized culture, not a more coherent one. The schools that are failing to respond to our best ideas about school improvement are the ones that essentially have no capacity to mount a coherent response to external pressure because they have no common instructional culture to start with. These are organizations for the private practice of teaching. The schools that are staying the same are typically the ones that have figured out how to meet the requirements of the system without changing the default culture. They're able to stay in a zone where they don't have to challenge instructional practice, largely because they are producing performance with social capital, not instruction. And the schools that are getting better are typically the ones that have managed to create, by their own devices, a more powerful instructional culture within their walls. In no case, has the improvement strategy directly addressed the issue of how to build a strong instructional culture at the system level that cuts across the boundaries of individual classrooms and schools. That is a much more complex task, requiring the creation of strong lateral relationships within and among schools designed around the development of a coherent instructional

culture. In other words, it requires a *practice of improvement*.

In order for the system-wide improvement strategies to work, they have to address the absence of a focus on the instructional core in the work of people in schools and in the work of people whose nominal job is to supervise and support schools. This means addressing the difficult task of building a common language of instructional practice, of building the connective tissue within and across schools by which the culture is propagated, of making the resources within the school and the system support the work of people around the development of practice, and by focusing greater attention on the knowledge and skill requirements of doing the work. We learn to do the work by doing the work, not by making more and more policies about the work, not by spending money on the next new idea about the work, not by asking people to do what they demonstrably do not know how to do and pretending that they do, and not by claiming that things are getting better when one part of the distribution is improving and other parts are staying the same or getting worse. The work lies in face-to-face interactions among people responsible for student learning around the work in the presence of the work.

Sources:

Cohen, David, Raudenbush, Stephen, and Ball, Deborah Lowenburg. "Resources, Instruction, and Research," *Educational Evaluation and Policy Analysis*, Vol 25, no. 2 (2003), 119-142.

Doyle, Walter. "Academic Work," *Review of Educational Research*, vol. 53, no. 2 (1983), 159-199.

Hawkins, David. "I, Thou, and It," in Hawkins, *The Informed Vision: Essays on Learning and Human Nature* (New York: Agathon Books), 49-62.

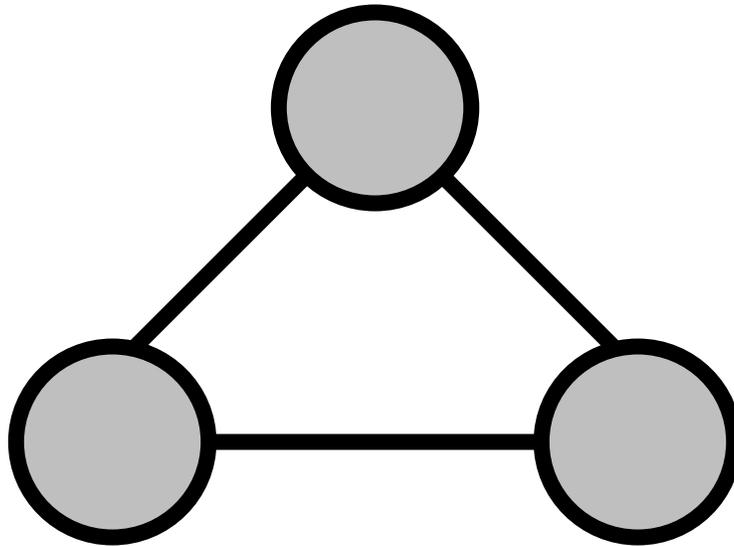
Marzano, Robert and Kendall, John. *The New Taxonomy of Educational Objectives*. (Corwin Press, 2007)

Schelling, Thomas C. "Command and Control." In James McKie, *Social Responsibility and the Business Predicament*. Washington, D.C.: Brookings Institution, 1974.

Exhibit

THE INSTRUCTIONAL CORE

STUDENT



TEACHER

CONTENT

SEVEN PRINCIPLES OF IMPROVEMENT

Principle #1: *Increases in student learning occur only as a consequence of improvements in the level of content, teachers' knowledge and skill, and student engagement.*

Principle #2: *If you change any single element of the instructional core, you have to change the other two.*

Principle #3: *If you can't see it in the core, it's not there.*

Principle #4: *Task predicts performance.*

Principle #5: *The real accountability system is in the tasks that students are asked to do.*

Principle #6: *We learn to do the work by doing the work. Not by telling other people to do the work, not by having done the work at some time in the past, and not by hiring*