

A SCALE Technical Report

LAUSD Mathematics Teacher and Coach Focus Groups: Views of District Instructional Guidance from the Field

Eric Osthoff
Wisconsin Center for Education Research

in collaboration with

Steven Cantrell
Los Angeles Unified School District

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Executive Summary

For three consecutive evenings in January 2004, researchers Eric Osthoff and Steven Cantrell met with secondary mathematics teachers and coaches to discuss the impact of several key elements of the District Mathematics Plan. The 22 participants were a diverse, though non-representative, collection of Algebra I teachers and secondary mathematics coaches. The primary aim of the meetings was to better understand the impact of several key elements of the district mathematics plan, including textbooks, the instructional guide, the periodic mathematics assessments, and mathematics coaches. A second aim was to test ideas for improving the quality of assistance currently provided by the district mathematics instructional support staff.

The meetings were held at the urging of the district Math Planning Group, and it is to this group that this report is submitted. The Math Planning Group includes administrators and staff for mathematics instructional support from LAUSD central and local districts as well as SCALE team members housed within and outside of LAUSD. The group is facilitated by IfL (Institute for Learning) and SCALE leader Lauren Resnick. Dr. Resnick is supporting the group in its efforts to foster rigorous and equitable mathematics teaching and learning in LAUSD as envisioned in SCALE. This report represents a form of technical assistance brought to bear by SCALE to expedite the collection and analysis of information needed by the Math Planning Group as it works to optimize guidance and support for improving mathematics teaching and learning for all LAUSD teachers and students.

From the opening minutes of focus group conversations, it was clear that assumptions about practice were deeply held by many of the focus group participants. Especially strong statements were made about the lack of students' algebra readiness and the consequent need for remediation. Equally strong were participants' commitments to the algebra textbook. This commitment was not to a particular algebra textbook, but to the practice that holds sacrosanct the order and content of a given chapter. In the face of a more academically diverse and younger set of algebra students, and using an instructional guide that treats the textbook as a resource and expects teachers to supplement it with other instructional materials as needed to teach the standards, teachers felt overwhelmed by the pressure to cover more content than is possible given the available time. The introduction of the periodic assessments heightened teachers' perceptions regarding the impossibility of the task.

It is important to recognize that neither the instructional guide nor the periodic assessments place impossible demands upon the classroom teachers. It was the conviction of these teachers that the students needed *more* than the guide requires that led to feelings of being overwhelmed. Adding remediation and covering the entire textbook, including the parts considered extraneous to the instructional guide, did in fact expand the curriculum beyond reason. While beyond both reason and the instructional guide, these curricular additions were not perceived as extraneous by the classroom teachers. Indeed, both the urge to remediate and the desire to cover the textbook reflect a powerful underlying set of assumptions that will need to be replaced by a more pedagogically powerful belief set if the district mathematics plan is to succeed. Any recommended change in practice that on the surface appears to further crowd this impossibly tight curriculum will be rejected out-of-hand. Indeed, our suggestions for curricular adaptation that introduced extended conversations around a single powerful problem, conversations aimed at exposing and remedying students conceptual misunderstandings, were viewed as potentially worthwhile but impractical, and were subsequently dismissed.

For these teachers there were facets of the system that exacerbated their perceptions of high demands and insufficient time. Of these, the assessment system was most salient. Periodic assessments were both threatening and insulting, but not unreasonable. They were threatening because teachers did not trust that the periodic assessments were formative, as advertised. Teachers felt exposed by low scores and worried that those examining the low scores would not have the proper context by which to interpret these scores. Some teachers complained that the students did well on what was taught, poorly on what was not taught, and that this reflected the overcrowded curriculum more than one's particular practice. Other teachers complained that assessment was a regular part of their practice and that the periodic assessments were a stroke of hubris by the district, purporting to assist, but instead acting as another factor crowding the curriculum. These teachers, and their colleagues, reported that for all their failures, the periodic assessments had visibly impacted the culture of the mathematics departments by increasing the frequency of discussion around mathematics (even if to criticize the assessments) and directing attention to the instructional guide, which by common admission could no longer be ignored.

Also contributing to sense of a crowded curriculum was the form of professional development delivery known as "banked time." These banked time days shortened the length of

that day's class period, which teachers claimed sent a signal to students that this day was less important than others. Adding to the frustration, the professional development that followed during the banked time day was itself fragmented, with many competitors vying for the limited available time. If the day was typically less frantic and the professional development more frequently directed toward mathematics teaching and learning, then the opposition would have been more muted.

The following report describes the sessions and provides a much more faithful rendition of teacher responses to our prompts. The level of detail cannot be substituted for in an executive summary, especially one like this, that places an interpretative frame on the entire set of teacher responses.

Introduction

This report summarizes information from three focus groups conducted with LAUSD mathematics teachers and coaches from January 14–16, 2004. The researchers were charged with conducting and reporting on focus groups by the district Mathematics Planning Group (MPG) as a way of exploring issues articulated by the MPG at its meeting on December 17–18, 2003.

Prior to December 2003 the Math Planning Group consisted primarily of the LAUSD Director of Mathematics and coordinators working in consultation with directors of other divisions (e.g., professional development) and senior district administrators for instruction. In December 2003, senior LAUSD administrators asked Institute for Learning and SCALE leader Lauren Resnick to begin working closely with the team on strategic planning to enhance their efforts to increase the rigor, equity, and effectiveness of mathematics teaching and learning in the district as envisioned in SCALE. At that time the team was further expanded to include several other groups of actors expected to contribute expertise and technical assistance. Steven Cantrell (LAUSD Program Evaluation and Research) joined as Los Angeles SCALE Lead and member of the SCALE Research and Evaluation Team. Eric Osthoff (University of Wisconsin-Madison) joined in the capacity of SCALE Research and Evaluation Team case study researcher for Los Angeles. The IfL Fellow for Los Angeles, and a University of Pittsburgh Professor of Mathematics Education who works regularly with IfL also joined the group. A number of district administrators and staff began sitting in with the group as appropriate to ensure communication across divisions. Examples include a policy analyst from the Deputy Superintendent's office, and a special assistant to the General Superintendent. Project managers from EduSoft and Educational Testing Service—companies with contracts for designing, scoring, and reporting results of district periodic assessments—have joined the group on an ad hoc basis. Finally, and importantly, numerous Local District Mathematics directors and coordinators joined the group. Two local district representatives attended the first MPG meeting facilitated by Dr. Resnick. Eight people from six different local districts attended the group's second meeting.

In the December meeting the MPG concentrated primarily on possible causes of, and potentially productive strategies for, responding to low student performance on district periodic assessments. Although the immediate objective was to identify actions expected to improve instruction and student performance in the near term, planning group members acknowledged the need for strategies to simultaneously support the long-range district goal of rigorous mathematics teaching and learning for all students. Likewise, group members acknowledged the importance of understanding challenges and possible support strategies in the context of on-going efforts by LAUSD central and the various local districts to improve mathematics programs and student learning.

The first of three report sections presents planning group hypotheses about causes of low student performance on periodic assessments and possible district responses. The second section describes focus group methods, participant sample selection and characteristics, and areas of district instructional guidance and assistance addressed. The third section summarizes teacher and coach comments and discusses implications of participant perspectives for the MPG to move forward.

I. Planning Group Hypotheses and Possible District Support Strategies

Below are three hypotheses the planning group identified in December of 2003 as likely factors in low student scores on periodic assessments. Following each hypothesis are steps the MPG identified that might be taken to evaluate the merit of the hypothesis and, if sustained, possible district actions to encourage and support improved mathematics instruction and student performance.

Hypothesis 1: Students lack specific knowledge that may be detected by the pattern of test item responses.

To evaluate this hypothesis, the MPG may analyze assessment data to determine if there is a relatively high-performing subset of students who have relatively few gaps in knowledge.

Possible responses to this problem include:

- Supplying teachers of students who have relatively limited knowledge gaps with information about standards on which students are not proficient.
- Encouraging and supporting re-teaching of unlearned content.

Hypothesis 2: Many students do not have the basic math concepts requisite for learning the standards scheduled for teaching in a given quarter.

To evaluate this hypothesis, the MPG may:

- Administer below grade level periodic assessments to determine whether students possess content knowledge for courses or levels preceding the one they are currently enrolled in.
- Devise plan for administering below grade level tests in a sequence that will not be discouraging to students, but will allow teachers to discern gaps in students' conceptual foundations that require extensive re-teaching.

Possible responses to problem: Provide extra teaching time to students with knowledge gaps (e.g., double the length of mathematics instructional periods; coordinate with Beyond the Bell or other strategies for extending instructional day, week, or year; increase coordination with private contractors, universities, or volunteer groups that provide tutoring). For students with fewer gaps, continue with instruction on Quarter 3 content in regular math class while using extra instructional time to re-teach missing content and concepts from Quarters 1 and 2. If necessary, regroup students who have large gaps in content and concepts from prior grade levels. For both groups provide extra instructional time to insure re-teaching phase is brief and does not become the basis for a permanent, low curricular track.

Hypothesis 3: Many teachers need help in effectively teaching material that is in the standards and measured by the test.

To evaluate this hypothesis, it was suggested that the MPG:

- Determine the extent to which teachers understand the full range of curricular content involved in standards and assessments.
- Determine the capacity of teachers to instruct in ways that enable students to gain proficiency in mathematical concepts associated with standards, not just memorization-based knowledge for solving routine problems.

Possible responses to the problem:

- Provide test blueprints and sample test items for the upcoming quarters to give teachers a clearer sense of what is expected. Also, revise the instructional guides to provide more and clearer assistance to teachers. This might include:
 - directing attention to specific tasks and problems in textbooks that are directly related to standards and rich enough to provide a basis for engaging students in concepts entailed in standards, and
 - providing teachers with or directing them to supplemental curricular materials that specifically target standards and related concepts in quarterly assessments and instructional guides.
- For at least a sample of conceptually rich problems, provide clear, detailed suggestions for teaching. Suggestions would include how to “set up” the task for class presentation, questions to ask of students, student responses to expect, and teacher follow-up responses.
- Provide teachers with additional professional development (PD) on engaging students in extended dialogue and investigation of important math concepts such as are involved in problems like those common to standards-based assessments. Design new, compressed cascade to quickly cultivate a small group of master coaches to begin working directly with math teachers in groups in their schools during banked days or other common planning periods, and with individual teachers in their classrooms. Focus initially on middle school and high school mathematics teachers with Algebra I courses, as this is where student performance is lowest and need for additional support is great.
- Begin developing larger cadre of apprentice coaches to extend district support to increasing numbers of district mathematics teachers over time. Apprentice coaches would be released to participate in weekly PD sessions, and work alongside master coaches as they directly assist mathematics teachers individually and in groups.

Focus group facilitators were charged with exploring hypotheses and teacher perspectives on district strategies as appropriate in the context of a general discussion of teacher experience with district instructional guidance and assistance. The groups yielded considerable information on matters related to Hypothesis 2 and 3, and somewhat less on the first hypothesis.

II. Focus Group Sample Selection, Sample Characteristics, and Protocol

The MPG decided to concentrate initially on Algebra I. Separate focus groups were conducted with middle school Algebra I teachers, high school Algebra I teachers, and coaches of

middle and high school math teachers to elicit a broad range of teacher experience, instructional practice, and needs relative to the Algebra I curriculum.

The teacher focus group sample was selected according to a teacher's probability of teaching an algebra class. We selected our sample of 50 teachers from two populations of algebra courses, those taught at either the middle school or the senior high school level. Twenty-five courses were randomly selected from each pool. Teachers assigned to selected courses were invited by fax, with up to three days advance notice, to participate. The invitation offered participants a \$50 gift certificate to be spent on instructional materials.

Of the 50 individuals in the teacher sample, 15 elected to participate, 8 middle school teachers and 7 senior high teachers. These teachers ranged in experience from 1 to 33 years, with a median of 10 years of experience. Ten of these teachers were fully credentialed, 2 were participants in the district intern program, and 3 were emergency certificate holders. The teacher focus groups consisted of 10 men and 5 women.

The coaches focus group consisted of 7 coaches, 4 women and 3 men, drawn from a pool of 11 coaches selected randomly based on geographic distribution. These coaches were personally invited to the meeting by phone and offered a stipend for participation. The coaches had one to three years of coaching experience in LAUSD.

Focus groups reflected considerable racial and ethnic diversity.

Although efforts were made to assemble representative focus group samples, it is important to acknowledge that sample sizes were small and significant self-selection occurred—of 61 individuals invited to participate, 22 did so. Focus groups are no basis for generalizing to the entire district. Focus groups provide better information about the *range and qualities* of teacher perspectives and practices than information about the frequency of perceptions and practices.

The balance of the report explores how teachers perceive contextual factors that play a major role in instructional practice, plus district instructional guidance provided through instructional guides, textbooks, periodic assessments, and professional development. The discussion of each of the above areas is divided into two parts. First, we summarize pertinent perceptions and observations related by teachers. Second, we relate possible implications of teacher remarks for district planning for future instructional guidance in mathematics. Implications for planning of future instructional guidance can be placed in three categories: (1) planning implications explicitly stated by teachers, (2) planning implications suggested but not fully articulated by teachers, and (3) planning implications of teachers' comments discerned primarily by the authors in view of challenges under consideration by MPG members at the time the authors were charged with conducting the focus groups.

III. Mathematics Teacher and Coach Perspectives on Previous

and Possible Future Instructional Guidance and Assistance

This section of the report summarizes teacher and coach perspectives on district instructional guidance and support activities related to periodic assessments, textbook adoptions, instructional guides, and professional development. Ultimately the most important insights into the nature and effects of district instructional guidance tools relate to relationships and interactions among tools. This is especially true of textbooks and instructional guides which teacher remarks show cannot be understood apart from one another. This is why textbooks and instructional guides are discussed in a single section. Although periodic assessments and professional development are discussed in separate sections, the ways these tools are connected to other tools will be important.

Before turning to areas of district instructional guidance and assistance it is appropriate to recognize teacher comments about the broader context of their work. Facilitators did not explicitly ask about contextual factors, but noted those that teachers characterized as integral to their views of district instructional guidance.

Contextual Factors Integral to Teacher Perspectives on Instructional Guidance

Without prompting, teachers and coaches in all three groups took the initiative at the beginning of each session to identify and assert the overriding importance of contextual factors that shape their work and deeply influence how they interpret and respond to guidance. Facilitators actively listened to and noted teachers' comments on context without probing extensively. A systematic account of contextual factors would require additional investigation. Factors emphasized by teachers in these sessions pertained primarily to the nature of their students, and instructional program and course design features.

Students. Teacher comments on students focused on two areas. First, teachers reported that many students enter Algebra I with major gaps in requisite mathematical knowledge. Teachers reported that many students lack understanding of important content areas (e.g., fractions, number theory), and cannot do basic arithmetic accurately and efficiently. Teachers indicated many students are three or more years below grade level in computational skills, and pervasive computational errors impede focusing on underlying concepts involved in Algebra problems. One high school math teacher reported many of her Algebra I students failed a Grade 2 classroom assessment she administered to them. Several teachers indicated students often exhibit greater capacity to understand Algebra problems conceptually than to execute computational tasks needed to solve problems successfully. These teacher perceptions relate directly to MPG Hypothesis 2 (i.e., students have large gaps in knowledge requisite to Algebra I).

Planning Implications. The MPG identified two steps that might be taken to increase understanding of mathematics knowledge gaps among students across grade levels, and the level of need for re-teaching—assessment item analysis, and administration of below grade level assessments in series to pinpoint student knowledge gaps. Teachers appear to already strongly believe that gaps are large and pervasive. Two things appear necessary for additional analyses and testing to be valued by teachers. First, the diagnostic value of tests must exceed the inconvenience of testing to students and teachers. One implication of this is that teachers would have to perceive the information yielded by diagnostic testing to be superior in some way (e.g.,

more accurate, more systematic, more efficient for surveying skills of large numbers of students) to what teachers already believe they know about patterns in student knowledge and proficiencies. Second, a new, detailed inventory of student knowledge must be accompanied by a viable strategy for responding instructionally to the student learning needs revealed by the inventory. Teachers indicated that low test scores are disheartening to students and teachers alike. Communicating on and delivering a strategy for responding to identified student learning needs is necessary for teachers to view a district focus on diagnostic assessment as legitimate.

A second point many teachers made is that motivation to learn and excel academically is very low among many students. Several teachers noted that the vast majority of students who put forth at least moderate effort to learn generally do well. Students who do not come to class or who attend without engaging in lessons or assignments account for the large number of failing grades given by teachers. Numerous teachers, especially at the high school level, reported Algebra I failure rates in the range of 40 to 50 percent.

Planning Implications. Issues of student motivation were noted, but not extensively discussed by the MPG at the December meeting or explicitly addressed in hypotheses used to frame focus group sessions. However, the IFL framework is highly attuned to issues of motivation, including how teachers understand its sources and effects on classroom learning. Focus group teachers appear not to subscribe to IFL theories of motivation or understand their implications for instructional practice. It is possible teachers simply have not had sufficient exposure to IFL knowledge and practices, or that teachers have had meaningful exposure without acquiring and applying IFL ideas. The district or IFL may already possess data that sheds light on the extent of teacher exposure to and adoption of IFL principles. If so, it may be fruitful to feed that information explicitly into the planning process at this time. If information on these matters is insufficient, additional focus groups or interviews targeting teacher views on sources and effects of student motivation may be useful.

One important IFL theory is that teachers who view effort as integral to intelligence exhibit high expectations for students and possess a heightened sense of instructional efficacy. However, even if teachers learn, adopt, and apply this theory, they may continue to believe that district policy and practices beyond their control have significant adverse effects on student motivation. The MPG may want to consider routinely reviewing decisions and plans specifically to screen for unintended but potentially adverse effects on student motivation. Teachers might respond favorably to messages from the district indicating the importance of student motivation to planners and how instructional improvement strategies take account of such considerations. For example, focus group comments indicate teacher support for further diagnostic testing involving administration of below-grade-level tests would suffer if teachers were to perceive it to be demoralizing to students. The MPG has recognized the need for diagnostic testing to be done in a way that is sensitive to students. Just as the committee decided it would be important for revised instructional guides to be accompanied by a statement of the rationale for modifications, teacher acceptance of further diagnostic testing may require similar explanations—including statements demonstrating steps planners have taken to avoid adverse unintended consequences.

Program and Course Design. Teachers and coaches identified three structural features of programs or courses they considered to conflict with or undermine district instructional guidance and assistance strategies. These features included: (1) a two-year algebra course, (2) the year-

round school calendar, and (3) fragmentation of teacher common planning and professional development time.

Several teachers suggested the district's two-year version of Algebra I was out of step with state assessments and believed the negative effects of the format on teachers, students, and schools outweighed any pedagogical advantage. Teachers indicated state regulations allow students to take the Algebra I assessment only after completing most of the course. Thus students in the first year of two-year Algebra I courses are forced to take the state assessment for a lower grade level. This entails a cost because the state downgrades the scores of students taking below-grade-level tests. This makes it more difficult for schools to make AYP for *No Child Left Behind*. Teachers feel student learning of Algebra I material is compromised if teachers spend much class time reviewing for below-grade-level tests. Students are also discouraged when required to take assessments containing material they have not recently studied.

Many teachers felt their experience had yielded little evidence that the two-year format increases student learning of Algebra I content. Several teachers thought the format might work better with pre-algebra material now taught mainly at grade 7. These teachers thought student readiness for Algebra I might improve if students were to spend two years studying pre-algebra, further noting the one-year pre-algebra course covers an especially large amount of content.

Planning Implications. The misalignment of two-year algebra courses with state testing would appear to be beyond the control of the MPG and the district. However, the lack of alignment between state testing and the two-year algebra creates stress, motivates schools to revert to pre-algebra just so students can perform on the exam, and likely depresses grade 8 scores or reduces the time available for algebra content.

If teachers and coaches in these focus groups are any indication, and the district continues utilizing the two-year Algebra I format, district managers may want to consider bolstering teacher support for the course. One way to do this would be to present teachers with data demonstrating greater student learning in the two-year course format, assuming such data exist.

Year-round Schedule. Three coaches and one middle school teacher expressed the belief that district instructional guidance tools play out differently in schools on year-round schedules. For example, they indicated that teachers in some year-round schools have fewer class periods than those in schools on traditional schedules to cover the material on each periodic assessment. This was perceived to exacerbate the same coverage pressures, which, as we will see later, most teachers appear to feel. Participants indicated that keeping pace with the instructional guide was especially problematic for B-track teachers on the 3-track calendar—asserting that these teachers never cover all sections of the guide. One explanation offered was that B-track classes cover less content because their students take a break of many weeks in the middle of each semester of instruction. Teachers said student retention of knowledge declines over long breaks. Since students in year-round schools take more frequent extended breaks, their teachers must spend disproportionately more time re-teaching topics. For students on a traditional calendar, the summer break is at a transition between school years. While some learning loss occurs, this learning loss is often attributed to inadequate content coverage in the prior school year. This explanation is unavailable to B-track teachers, who have the same students on both sides of the two mid-term breaks. Thus, the learning loss that occurs during school breaks is more salient to

these B-track teachers, who then spend time in review, further collapsing the time available to cover all topics in the instructional guide.

A coach from a year-round school also said it was more difficult to keep track of and respond to teacher professional development needs in year-round schools because teachers vary in where they are in their instructional year at any given point in time.

Planning Implications. Coaches voiced notably greater concern than teachers about implementing planning guides and professional development in year-round schools. It is possible that the teachers who participated in these focus groups happened to disproportionately come from schools on traditional schedules and that we would have encountered greater teacher concern if the sample contained more teachers from year-round schools. Before planning or deploying guidance or assistance tailored to year-round schools it would be appropriate to have more information than these groups yielded. If the district lacks information about special challenges of year-round schools, it may be valuable to conduct additional focus groups or interviews with teachers, coaches, or administrators of such schools to clarify issues and evaluate alternative support strategies.

Fragmented Planning and Professional Development Time. All groups cited factors contributing to fragmentation of joint planning and professional development time. Many such factors are as much under the control of local district and school administrators as under the control of a central office. Several middle school teachers voiced two concerns about aspects of early release days—a policy that is perhaps more under the control of Central Office. First, classes are frequently less productive on early release than regular days. Students reportedly have a marked preference for trying to run down the clock on short days. Second, teachers report truncated classes are not long enough to do justice to many topics even when students are engaged. Thus teachers perceive early release days to infringe on content coverage in ways that only intensify pressure on full days.

From the perspective of one coach, the structure of early release days was far from optimal as a context for teacher professional learning. Teachers were characterized as coming to early release day PD sessions tired or distracted by the day's events, and barely becoming engaged before leaving for a departmental meeting or some other activity that competes for attention on early release days.

Planning Implications. Middle school teachers voiced a clear preference for having banked time allocated in fewer 1-day increments instead of being meted out in many 1 to 2 hour chunks. It would not be surprising to discover that state regulations or logistical considerations make such an arrangement impracticable. However, planners should be aware of potential negative pedagogical impacts associated with fragmentation of teacher planning and professional learning time. Planners might also consider ways to minimize fragmentation of planning and PD within the parameters of early release days. In weighing options planners should recognize a related point made forcefully by teachers: If the district seeks to increase common planning or PD time for teachers, it should come out of teachers' time with their classes. Teachers believe students make little academic progress with substitute teachers and can ill afford to have teachers even more frequently absent.

Teacher Perspectives on Four Major Areas of District Instructional Guidance and Assistance

We turn now to teacher and coach views of four main areas of district guidance and support activities: (1) periodic assessments, (2) textbooks, (3) instructional guides, and (4) professional development.

Perhaps the most important point illuminated by focus groups is the sophisticated understanding participants have of relationships among instructional guidance tools. One coach sounded an important theme when participants were asked to characterize the relative level of influence of assessments, standards, textbooks, and guides on teachers' decisions about instructional content. She suggested the most powerful influence was not rooted in any single individual guidance tool, but stemmed from the fact that multiple tools (i.e., standards, assessments, guides) had become linked (i.e., aligned). Coaches concurred that teachers in their schools had become involved in the most serious, on-going discussion of instruction in years. Coaches further agreed the conversation was prompted by the fact that standards, assessments, and guides were now sending teachers similar signals as to important instructional content. As will be seen, the conversation is highly contested. Many differences of opinion about the effects and desirability of district guidance may be traced to the relationship between textbooks and guides. Simply stated, textbooks were sending extremely powerful signals about the substance and order of instructional content. However, whereas some textbooks were seen as being relatively highly aligned to guides (and thus to periodic assessments), others were not.

The tenor and implications of relationships among guidance tools for group participants will be prominent in the discussion that follows. For reasons that will become evident, it is possible to discuss periodic assessments and professional development somewhat apart from other tools. However, teachers and coaches view textbooks and instructional guides as being intertwined to such an extent that they can only be discussed in conjunction.

Periodic Assessments

General Views. Coaches and teachers exhibited significantly different views of periodic assessments. Where coaches recognized assessment related challenges emphasized by teachers, they also placed much greater emphasis on the perceived value of assessments as a vehicle for stimulating productive discussion of mathematics teaching and learning among teachers and administrators. One coach was affirmed by others when she said, "I think we are moving in the right direction because one thing the assessments are doing—good, bad, or ugly—is getting people to talk. People are starting to talk about practice." Unlike coaches, the vast majority of teachers displayed no inclination to make global statements about assessments. Teachers generally related to assessments pragmatically by focusing on what might be considered specific or technical aspects of assessments, and on impacts of assessments on instruction.

A minority position expressed emphatically by one teacher and shared somewhat by two others was that periodic assessments constitute an incursion on teacher professionalism and that periodic assessments are associated with too many problems to be salvaged as a productive instructional guidance tool.

The majority of teachers did not exhibit highly solidified views of assessments. Their general stance can be characterized as cautious and skeptical. It seems important to observe that teachers' particularistic concerns are numerous. It is possible that the cumulative weight of concerns represents a different and possibly greater challenge to planners than any single problem teachers noted. It will be interesting to see whether teachers' general attitudes toward periodic assessments improve incrementally as distinct concerns are satisfactorily addressed, or if teachers treat concerns as a package deal—holding out for simultaneous resolution of many or all concerns.

Specific Issues

Teachers' specific concerns about periodic assessments are discussed below under three headings: (1) teaching to tests, (2) pedagogical value of assessment data, and (3) enabling instructionally appropriate teacher responses to assessment data.

Teaching to tests. It was immediately apparent that teachers were highly sensitive to and resented anything they perceived as “teaching to the test.” “Teaching to tests” is sharply at odds with teachers' basic beliefs about valuable forms of knowledge and learning. Teachers saw it as undermining their ultimate goal of fostering deep student understanding and capacity for lifelong learning. An indication of teacher sensitivity on this subject was the extensive clarification teachers sought from facilitators before accepting that a certain assistance strategy under consideration by the MPG, as described by facilitators, was not really a subterfuge for blatant teaching to tests. Here we are referring to the idea of using problems modeled on assessment items as a starting point for in-depth classroom dialogue and investigation into big mathematical ideas and concepts (see Hypothesis 3, second bullet, above). We came out of teacher focus groups feeling the way we introduced the idea was not highly flawed and thinking teachers might have been equally skeptical of any brief description of an assessment related instructional strategy.

As facilitators, we were not especially surprised by teachers' aversion to “teaching to tests.” However, we were surprised to find what we interpret as a *lack of consensus among teachers as to what actually constitutes teaching to tests*. For example, teacher judgment was mixed as to whether providing teachers and students with sample or practice test items would constitute teaching to the test. Some teachers said the district would be encouraging teaching to the test if they provided teachers with a test blueprint.

Consider the anecdote related in the following teacher quote: “We got the [periodic assessment] practice guide beforehand. My kids did really well and it's not because I'm a brilliant teacher. My coach or chair said ‘teach this’. I was just as far behind the pacing guide as everyone else for first quarter tests. My students performed really well. They did fine on graphing on the district test. Then I went back and re-taught Chapter 7 on graphing and they failed the classroom test I gave them on it. They passed the periodic assessment because of what they had memorized before hand.”

This passage contains several ideas, each subject to multiple interpretations. One plausible reading is that this teacher experienced the guidance she received as having led her to teach to the test. Remarkably, she may not have understood her own practice to constitute

teaching to the test when she was actually engaged in the instruction in question, but only came to that understanding of her practice when viewed in connection with a subsequent experience (i.e., her students' poor performance on a related classroom test).

Coaches had a more differentiated understanding of the issue of teaching to tests and were comfortable that strategies proposed by the MPG did not violate precepts against teaching to tests.

Planning Implications. If focus group teachers are somewhat representative in their opposition to teaching to tests, and in their tendency to use highly inclusive criteria to identify instances of teaching to tests, it poses a challenge to several possible assistance strategies identified by the MPG in December. One way to meet such a challenge is by explicitly addressing the issue of legitimate and illegitimate ways of relating assessment and instructional practice in professional development sessions (perhaps in the same sessions where master coaches would work with teachers). Such professional development might gain strength if it cuts across several areas of expertise in the planning and support system. For example, people from the district math and assessment divisions, IfL, and ETS, as well as local district math supervisors, coaches, and teachers may have valuable knowledge and ideas to contribute.

The MPG may desire further inquiry into the range of teacher beliefs about “teaching to tests.” Surveys, focus groups, or interviews are all options.

Pedagogical Value of Assessments. Teachers were skeptical, but did not summarily reject the idea that periodic assessments could provide valuable information for making classroom-level decisions about instructional content. Many teacher and coach criticisms of assessments can be seen as technical issues that are largely within the districts' power to address and, if appropriate, to act on. Such concerns included:

- Content is poorly distributed across periodic assessments and instructional periods. Algebra I contains an unrealistic amount of content in third quarter, for example, and too much time is given to review after the last periodic assessment and CAP 6. Teachers recognize and deeply resent the fact that administration of CAP 6 with many weeks remaining in school year decreases the amount of time for instruction before testing. Teachers believe the system monitors student achievement mostly or solely with assessments. This pressures teachers to cover as much of the year's content as possible by test time.
- Periodic assessments emphasize content at the end of the instructional period. Teachers and students can succeed with the majority of content in an instructional period and come out looking like they accomplished little.
- Preparing for and administering periodic assessments cuts into time available for instruction. The combined testing burden of CAP 6, periodic assessments, and final exams is significant.
- Periodic assessments and textbooks use different terminology (e.g., one may say “solve graphically” when the other says “solve by graphing”). Differences are especially difficult for ELL students to adjust to. Students become confused and fail to recognize they have the appropriate knowledge to solve problems.

- Students have no idea what is expected on open response items. (Teachers suggested they be given sample open response items).
- Open response item rubrics were of low quality, and teachers were not given time to score items.
- State and district grade level tests send different signals about important content. One may place much more emphasis on Algebra, another on Geometry. It was suggested that state and district tests be aligned to reflect relative weight on content strands within grade levels).

MPG ideas about possible responses to low test scores appear to address many of the technical issues teachers raised. The MPG is in the best position to determine whether criticisms they have yet to address are technically sound and important enough to warrant immediate attention.

Enabling instructionally appropriate teacher responses to assessment data. Designing, administering, and analyzing assessments to yield data with profound implications for instruction is only half the battle. Once teachers have and understand good data, they must possess the capacity to identify and implement appropriate instructional changes. However, the decision to attempt implementation is not automatic. A potentially serious impediment to teacher willingness to attempt appropriate instructional changes based on test score data is illustrated by the teacher comments paraphrased below. From one teacher:

I'm insulted that the district thinks I need to give this test to know how my students are doing. The pacing plan is too tough for me to meet, and so when I look at the pacing plan and I look at the assessment, I say, 'Yup, they understood what I taught them; they didn't understand what I didn't teach them.' But the district looks at it and they say, 'You know, that guy didn't teach them well.'

And from another:

The general idea of the assessment is fine. But I knew kids wouldn't do well on parts I didn't teach. Then the prompts (automated feedback on test performance) told me they didn't know the distributive property. I know they didn't understand any of the properties, not just that one.

Teachers sounded this theme repeatedly. Without prompting from us, coaches reported they have been hearing the same thing from teachers.

We will look more closely at teacher perceptions of content coverage pressure in the *Textbooks and Instructional Guides* section, below. The important thing to recognize here is the tendency of teachers to frame poor test performance largely as a matter of content coverage such that the only way to teach required content is to go so fast that students would have little chance of learning the material anyway. Under this construction of the problem, teachers may feel justified in concluding that the only way to preserve their own discretion to engage in sound pedagogical practice (e.g., focus on conceptual understanding, inquiry-based learning) is to resist or reject what they see as the unrealistically expansive definition of important content underlying state and district standards-based assessments. In other words, teachers see breadth and depth of

content coverage as a “zero sum game” and further believe that the only way they can devote instructional time to going deeply into important mathematical concepts is to reject to some degree what they perceive to be intense and rising emphasis on breadth of content coverage at the district and state level.

We can look to expectancy theory, a line of work within organizational theory, for help in making sense of how teachers understand the pedagogical implications of poor test scores. According to expectancy theory, teachers might decide not to act on informative assessment data even if they believe they possess knowledge and skills, which if deployed, would bring about improved student performance. A further condition that must be met is for teachers to believe there is a reasonable chance of success at a level of effort they can cope with as individuals. Teachers’ beliefs about levels of available organizational support may heavily influence their sense of the feasibility of undertaking a given labor-intensive goal. Teachers in our focus groups were clear in saying the only available strategy they see for substantially improving student scores is to teach each topic as effectively as they have been but at a much accelerated pace. Teachers have already decided acceleration alone is not enough to go on.

Planning Implications. Teachers appear to need much help reconstructing how they understand their content domain in ways appropriate with a standards-based emphasis on conceptual understanding and application of knowledge. Ultimately teachers must see that simply going faster is not the only possible strategy for improving teaching, learning, and test performance. MPG ideas about modifying instructional guides to help teachers identify particularly high-priority content, and professional development to make re-teaching more targeted and mathematically powerful are two examples of such alternatives. We will explore teacher reactions to these and other instructional improvement strategies below.

It is imperative that teachers perceive the larger organization to be offering them something other than merely increased pressure to pick up the pace of instruction. They need to understand how evolving district guidance and assistance increasingly embodies a strategy for working smarter instead of harder. Although some policymakers and planners may be discouraged by the apparent pessimism of focus group teachers about prospects for improvement, it is important to recognize the district has substantial resources that can be used to help teachers understand and utilize multiple, coordinated strategies leading to more effective deployment of instructional time and effort. Although far from certain, it is reasonable to expect teacher commitment to the goal of improved student performance will rise as teachers acquire increasingly better understanding of the nature of the challenges they face and the full range of strategies available for meeting them.

Textbooks and Instructional Guides

Teachers clearly understood instructional guides are based on periodic assessments and underlying standards. Yet, teachers criticized instructional guides much more intensely than other district instructional guidance tools. To understand teachers’ criticisms of guides, it is necessary to consider what teachers believe the guides are telling them do instructionally, and how guidance signals attributed to guides conflict with guidance signals from other sources such as textbooks and traditional teacher beliefs about instructional practice.

It was highly evident that nearly all focus group teachers viewed textbooks as the primary source of curricular content. Until the advent of instructional guides—backed by aligned standards-based periodic assessments—textbooks were also treated as the primary source of guidance on basic instructional practices such as pacing and order of topic coverage. This should not be too surprising since textbooks are by far the most widely available resource that addresses issues of content, pacing, and order of topics at a level of specificity approaching the high level of detail teachers require for daily instructional planning and practice. Until periodic assessments were instituted, teachers treated district instructional guides as advisory. Based on reviews of guides that were sometimes cursory, many teachers determined that their practice was already sufficiently aligned to guides. Others concluded that areas of misalignment were due to flaws in the guides, or that to redress misalignment would require great teacher effort and be unlikely to have much impact on student learning. This year the addition of periodic assessments has created a situation where teachers feel compelled to look very seriously and relationally at signals coming from textbooks and guides.

Strong evidence for the argument that assessment-backed guides are challenging traditional textbook usage is found in the fact that teachers who use the McDougal Littell Algebra I text are reportedly experiencing relatively little disruption with district instructional guides whereas teachers using other textbooks are finding the guides especially difficult to accommodate. Teachers attribute this to the fact that the district aligned the Algebra I guide to the McDougal Littell text. In examining the district guide released in Summer 2003, one finds the guide calls for skipping over many textbook sections. However, textbook sections that are covered are generally listed in order in the sense that the topic lists rarely circle back to content addressed primarily in earlier chapters. By comparison, teachers using other textbooks report that following the order of topics as listed in guides requires skipping back and forth with little regard for textbook topic order. Teachers argue this disrupts the continuity of instruction for students, thereby introducing inefficiencies (i.e., increased need for review and re-teaching) that exacerbate the sense that there is not enough time to cover all the content “required” by the district.

One way to summarize the implications of what teachers said about the relationship between district guides and various texts is that guides allow teachers with certain texts to continue using textbooks in traditional ways while teachers with other texts are pressured to alter textbook usage in ways that require extensive reorganization of courses and may be less efficient in producing achievement. Teachers falling in the latter category offered various arguments for resisting the perceived pressure to deviate from textbook topic ordering. For example, numerous teachers asserted that textbooks are written by people with pedagogical expertise, and the order of textbook topics is authoritative because it is research-based. Two teachers went even farther in arguing for the appropriateness of heavy reliance on textbooks. These teachers said every problem in a textbook is chosen based on research about student cognitive developmental needs. In their view it is pedagogically unsound for teachers to skip or reorder textbook problems. In contrast to textbook authors, teachers questioned whether district personnel who write instructional guides have sufficient pedagogical expertise.

Teachers’ preferred way of constructing and resolving the problem of conflicting signals among textbooks and instructional guides shows that teachers generally do not appreciate the level and nature of instructional reform district planners envision as needed for successful alignment of instructional practice to standards and standards-based assessments. Consider the

pervasive assumption among teachers that the district expects topics to be taught in the order listed on guides. We see no such statement in the guides themselves and wonder if this message was sent some other way, or merely represents an assumption being made by teachers. Certainly the guides do place demands on teachers to cover a certain range of topics within a given quarter, but the order or pace of topic coverage does not seem highly prescribed by guides.

It appears teachers believe the basic structure of their instructional program—right down to topic order and pacing—is, or ought to be, specified in considerable detail by some external guidance tool. Teachers are accustomed to their textbook being their only source of guidance formulated at a level of specificity commensurate with everyday instructional decision-making. Teachers appear to feel that if guides are going to impinge on their ability to rely on textbooks for practical information about content selection, pacing, and topic order, then they want the alternative approach embodied in guides to be as comprehensive, coherent, and specific about instruction as textbooks are perceived to be. We believe this relates directly to why perhaps half of the teachers responded fairly favorably to MPG ideas such as modifying guides to list specific textbook problems that relate closely to standards, and providing sample assessment items teachers can use to engage students in the kind of cognitively challenging tasks emphasized on district and state assessments (see Hypothesis 3, above).

At the same time many teachers favored more specific guidance from the district, all teachers and most coaches agreed that district guidance should be advisory rather than mandatory. Related to this was the frequently expressed view that experienced teachers—especially ones with mathematics credentials—need far less guidance than teachers who lack experience or mathematics credentials. There was also broad agreement that special education teachers are especially lacking in mathematics content knowledge and thus in greater need of need of specific mathematics instructional guidance than perhaps any other group of teachers.

One high school teacher expressed a minority view of the role of textbooks that provided an instructive contrast with the norm of heavy reliance on textbooks. His perspective is paraphrased below.

I don't know if having or not having the same textbook is really what's at stake here...If you were to look at districts with successful algebra programs I don't think it would boil down to the book. As educators I think we can all make this flow right. I think we have to look at other things. I don't think the textbook is the reason our kids are not successful. I think we need a pacing plan because our kids move around so much. We're well versed enough as teachers to adjust to different textbooks.

It appears that LAUSD Central and the local districts have tended to assume what this teacher was saying—that most teachers possess the capacity to successfully integrate signals for texts, guides, assessments, standards, and peer norms of instructional practice without any systematic support from others. However, most teachers and coaches told us this is not true and that teachers need considerable assistance if the goal is powerful instructional strategies which represent a synthesis of the complex array of messages about important content and appropriate instructional practices.

Coaches were especially emphatic that far too few teachers do long-range planning. Coaches report the norm is for teachers to begin each class by turning to a textbook lesson, working a few examples, briefly responding to student questions, then assigning five to ten problems for students to work on. If teachers feel they are getting behind, they skip sections, but topic order is otherwise textbook-driven. Several coaches argued (and none disagreed) that more and better long-range planning is needed for teachers to sufficiently understand the breadth and depth of concepts and knowledge in their courses. These coaches went on to argue that teachers must have such a grasp of courses to design and implement instruction that uses textbooks in a flexible way to address standards at all levels of cognitive challenge in an order that aligns well to periodic assessments. One coach suggested going so far as to have teachers map out every concept in each state standard and then identify what if any part of their textbook could be used to get at the concept. She said teachers would be surprised at how many holes exist in most textbooks when one adopts an appropriately fine-grained view of standards-based content. Another coach accentuated this point when she said there is a general need for teachers to more actively modify and shape curricula. She went on to explain, “Texts don’t have enough higher level problems. That’s where the focus should be, not on which [whole] sections to cover or not.”

Planning Implications. Let us be clear about how focus group teachers understood the relationship between texts and guides, and consider the implications for changes in understanding teachers must work through (with district assistance) if teachers are to become fully engaged partners in a standards-based instructional system.

At the crux of problems teachers see in the relationship between textbooks and instructional guides is a marked tendency of teachers to assume the presence of what economists refer to as a *zero-sum goods*. Zero-sum goods are finite and scarce. A prime example would be the amount of money in an organization’s annual budget. Zero-sum goods force difficult practical decisions because dedicating increased funding to one desirable purpose requires taking the same amount away from another valuable purpose.

For teachers, instructional time is widely seen as a zero-sum good. It follows from this that if one wishes to increase instructional time on one domain (e.g., conceptual understanding, or application of knowledge to complex real-life problems), then one must reduce time for some other domain (e.g., basic facts, facility with routine algorithms). Underlying this view of teachers is an assumption that instructional time is generally used in highly efficient ways. Otherwise, one could close the gap between amount of content typically taught and the additional amount of content on standards or assessments by simply squeezing more teaching and learning into available classroom time. There is also a tendency to constitute the relationship between textbooks and guides in a way that is exactly the opposite of what district planners would like. Many teachers get their basic instructional plan from their textbook, then make minor adjustments in textbook usage in response to guides. As we understand it, district planners want teachers to begin instructional planning by laying out courses based on deep understanding of standards-based instructional guides then bring in textbooks as one resource to support instruction that reflects the content and levels of cognitive challenge emphasized by standards.

Formulating problems well is important, but not the same as identifying strategies for resolving them. Nonetheless, we believe planners will benefit from reflecting on possible connections between two main points in the preceding discussion. The first point is that teachers

want the guides to go away or become more specific than they currently are. The second point, made primarily by coaches, is that teachers need much more help using guides for long-range instructional planning and decision-making. In fact, guides or no guides, too many teachers are reportedly bouncing through textbook content in ways that are at best only loosely coupled to standards.

We would encourage planners to examine carefully any assumption to the effect that this is an either/or proposition. Although we can imagine increased specificity in guides being quite productive, we do not think it can be treated as a substitute for significant support and professional development for teachers on how to understand and apply signals embedded in guides to their own instructional practice. We are not arguing that planners and teachers necessarily need exactly identical knowledge about curricula and instructional practice, but we do believe successful coordination across role boundaries requires some shared knowledge. The IfL concept of nested learning communities is highly relevant here. In fact, we think this and other core IfL concepts offer important guidance for strategic planning that might be undertaken to design and institute professional development activities to help teachers get the most out of increasingly specific instructional guides.

Before turning to professional development, we relate several additional points teachers and coaches made about textbooks and guides that we found potentially important.

- Block scheduling gives teachers flexibility that enables them to incorporate new instructional demands or strategies in ways perceived to exacerbate content coverage pressure to a somewhat lesser degree. For example, teachers on block schedules suggested that such an arrangement would make it far less disruptive for them to dedicate 40–50 minutes weekly to the kind of extended inquiry into the conceptual basis of standards-based problems as proposed by the MPG.
- As with periodic assessments, teachers criticized the amount of material “crammed” into the third quarter of instructional guides, and complained that too much time was allocated for review following CAP-6 administration.
- Teachers perceive the Cognitive Tutor curriculum to be especially poorly aligned to state and district standards. Teachers believe the two days per week students spend in computer-guided instruction has little bearing on standards-based content and learning. Consequently, teachers in classes using Cognitive Tutor feel they have to cover the same amount of material as other Algebra teachers in 40% less instructional time. Cognitive Tutor teachers fear the performance of students in their classes will improve at a much slower rate on district periodic assessments than students in other Algebra I courses.

Professional development

Focus group discussions of PD were framed somewhat differently for teachers and coaches. With teachers we sought to learn about:

- Previous PD not involving district math coaches.
- Experience with coaches, including PD.
- Ideas for future PD, including reactions to possible activities identified by the MPG.

Conversations with coaches focused on:

- The role of coaches, especially with respect to allocation of time to PD versus other functions.
- Teacher responses to coach-facilitated teacher professional learning.
- Coaches' views on directions for future teacher PD, including coaches' views of issues that would arise for teachers in connection with PD activities being considered by the MPG, and ideas on possible strategies for responding to teacher needs and expectations.

Interviewing teachers and coaches in different sessions and summarizing their ideas separately enables us to examine important questions from the perspective of two sets of actors with different roles in the district and schools. We believe the differences in perspectives have significant implications for district policymakers and planners—coaches have experience facilitating teacher professional learning that they may draw upon in assessing potential strengths and weaknesses of MPG strategies for improving mathematics PD. The main discussion of planning implications in this part of the report follows discussion of teachers' and coaches' PD experiences and reaction to possible future activities.

Teacher Professional Development Not Involving District Mathematics Coaches

Our impression from focus groups is that mathematics teacher participation in PD that does not involve coaches is fairly light. We do not know if this is true. If it is true, we do not know if it is because PD opportunities for high-quality PD are limited, or if teachers are simply not responding to opportunities. Although we do not feel we can construct a comprehensive and coherent picture of this domain of teacher PD experience from focus group data, we can relate some relevant and potentially important teacher comments.

- Teachers feel PD in their districts and schools heavily emphasizes literacy instruction and that mathematics PD has not been a high priority of late.
- The district tends to have a one-size-fits-all approach to PD according to which each topic addressed by the district is approached in just one way. Teachers believe differences among them require differentiated PD sessions just as their students have diverse learning needs that require a variety of approaches to the same topic. For example, middle and high school teachers with mathematics credentials are unlikely to get much from a mathematics PD session that is highly appropriate for special education teachers, and vice versa. Also, new teachers have different needs than veteran teachers.
- District PD is often provided under circumstances that are unacceptable to teachers. Teachers are reluctant to participate in PD sessions that require them to leave their classes to substitutes. PD stipends make a big difference. This is especially true for summer institutes because teachers often have to forego income from summer school teaching to participate in training.
- Follow-up support and resources needed to implement district PD are sometimes lacking. Teachers report attending professional development sessions that demonstrate curricular materials and manipulatives only to discover they cannot procure the materials for classroom use.

- Mathematics teachers were uniformly highly positive about PD conducted through the LAUSD/UCLA Collaborative Initiative (LUCI) program. Teacher descriptions of LUCI suggest the initiative is based on instructional goals and beliefs that have much in common with current MPG perspectives. If the district has evaluated LUCI, the planning group needs to be aware of that information. If the program has not been evaluated, it should be. It would be especially interesting to see what might be learned about actual teacher use of knowledge and practices acquired through LUCI. If the program is advocating rigorous instructional practices that teachers are actively implementing, it would be valuable to know what underlies the success. If teachers are not actively applying LUCI knowledge and strategies, it would be useful to explore where it is breaking down. The MPG has indicated a desire to identify and disseminate examples of powerful mathematics instructional practice in LAUSD. Perhaps teachers who have participated in LUCI should be considered as a possible source of such examples.
- Aside from formal PD sessions, school meetings and joint planning activities represent opportunities to systematically contribute to teacher professional learning. Teachers agreed that school-wide in-services and meetings have little impact on mathematics instruction. Department-level meetings and planning were characterized as being much more likely to address instructional issues at a meaningful level. The typical focus group teacher appeared to have 2–4 hours of departmental joint planning and meeting time monthly. It appears a similar amount of time is allotted to school-wide meetings and planning.

Teacher Professional Development Involving District Mathematics Coaches

The district has already conducted an evaluation of mathematics coach practices and impacts¹. Focus groups reaffirmed many points in the district evaluation of mathematics coaching, but also extended the discussion in some ways. Mostly, we think it is helpful to be able to compare and contrast teacher and coach perspectives on coach-facilitated professional learning.

A general observation is that teachers find coaching functions and quality to be highly variable. Teachers attribute variability to real differences in the capabilities and practices of individual coaches, to levels of administrative support for coaches, and to teacher attitudes toward the very concept of having a coach working alongside them to examine and improve teaching practice. Another general observation is that variability appears lower and teacher perception of coaching quality appears higher at the high school than the middle school level.

Teachers reported considerable uncertainty about the intended role or functions of coaches. Teachers observed that coaches spend a large portion of time on what are characterized as “secretarial” functions—coordinating periodic testing, scanning tests, doing paperwork.

¹ Cantrell, S. M. (October 6, 2003). *IFL Implementation and Instructional Leadership: A Role Study of the Directors of School Services*. (Planning, Assessment and Research Division Publication No. 168). Los Angeles, CA: Los Angeles Unified School District.

Coaches were also characterized as spending a great deal of time in meetings, many of limited relevance to mathematics teaching and learning. The allocation of time to these areas meant coaches were not actually engaged in coaching teachers very much. Coaches tend to focus heavily on helping new teachers in the limited amount of time they actually have for focused teacher interaction. Teachers attributed much of the responsibility for fragmentation of coaching functions to lack of administrator understanding or support for coaching. A related problem of administrative deployment of coaches concerns the perception of teachers that significant numbers of principals use coaches less to assist and more to spy and report on teachers. Principals should understand that coaches who cross this line are considered by teachers to have committed a fundamental breach of trust and are no longer a legitimate source of teacher support or assistance.

Focus group teachers acknowledged many teachers are unreceptive to coaching. They said some teachers are set in their ways and are not going to listen to anyone. However, even teachers who are considered to be reasonably open to change and coaching have very mixed experience with coaches. One factor of overriding importance for teachers who are at least moderately receptive is the perceived credibility of individual coaches. Experienced, credentialed teachers—especially at the high school level—are very discerning consumers of coaching assistance. Our read is that such teachers tend to focus on status differentials—on what the teacher has that the coach does not—instead of what the coach has to offer that the teacher could use. Several teachers noted how concerns about coach credibility with veteran teachers entered into their approach. One teacher reported his department convinced their principal not to hire a coach by arguing that a coach would only come in and disrupt improvement strategies that were already working. Another principal decided to go without a coach unless he could find a retired mathematics teacher who would command respect from veteran teachers—he is still looking.

It is instructive to consider the list of qualifications teachers generated as criteria for coach credibility. Teachers expected coaches who:

- Have mathematics credentials, strong subject area content knowledge, strong teaching skills, and strong classroom management skills.
- Have taught all versions of all courses (e.g., all Algebra I formats, at all grade levels offered) they provide coaching support for.
- Currently teach a section (some teachers said two sections) of each course for which they provide coaching support.
- Have experience with the same populations of students the teacher has (e.g., ELL, special education, low-income).
- Knows the students in the classes of teachers they assist.

It is a concern that teachers did not notice that there would be few if any people who can meet such extensive criteria. In the December MPG meeting, Lauren Resnick recommended that any new PD being considered by the MPG should not be mandatory at first. Instead, she argued, start smaller with something of very high quality; people will decide they cannot go without it. This seems like a potentially productive strategy given the apparent tendency of teachers to focus on what PD providers lack instead of what they do have that is needed.

Beyond generalities, we heard some about coaching practices teachers did or did not find productive. Teachers who found coaching unproductive reported their coaches had been focusing on areas teachers consider inappropriate or of low priority. Examples included near total concentration on cumulative assessment activities, and near total focus on examining student thinking in the context of Cognitive Tutor. Teachers who had positive experiences with coaches especially appreciated when coaches provided high-quality demonstration lessons, helped new teachers learn how to prepare lesson plans, took over classes to give teachers release time to go observe others, acted as a clearinghouse for information on best instructional practices, and provided constructive criticism.

Teacher Ideas for Modifying Professional Development and Reactions to Possible Future Activities

Teachers generally reacted favorably to the intent of MPG ideas about possible future professional development—including PD designed to help teachers use assessment-like items as a basis for class-long inquiry into and strengthening of students’ conceptual understanding of the big mathematical ideas embedded in items. Several said they had read *The Teaching Gap*—a book on the Japanese lesson study approach. Teachers were excited and positive about the kind of instruction and PD they saw in *The Teaching Gap*, and indicated they saw many similarities in what the MPG was proposing. However, teachers quickly posited their zero-sum good perspective on content coverage pressure and concluded that circumstances would constrain them from doing the kind of in-depth teaching for conceptual understanding being proposed. In fact, some teachers said their instruction used to be more in line with the direction envisioned by the MPG, but said they had to curtail that kind of instruction because it is time consuming and incompatible with pacing in district instructional guides. Here, paraphrased, is one teacher’s response:

The UCLA class I took always started with a problem of the day. I built up a nice library of problems and became very comfortable with teaching from them. And my kids improved a lot on them over a year’s time. The problem is the time it requires. I don’t see how I could do lessons like that anymore with all I have to cover now.

A different, perhaps contradictory, teacher message is captured in the phrase “I’m already doing that.” Teachers repeatedly said they are in fact already engaging in recommended practices at least to a degree. How are we to reconcile the notion that the instructional practices being suggested are simultaneously highly impracticable and highly present in teachers’ classrooms? Perhaps one way to formulate it is to say that teachers already believe they have capacity for instructional practices, which, however desirable, are not ones they are being compelled to utilize. Do teachers actually possess deep knowledge about teaching for understanding, or just enough to feel warranted in dismissing the feasibility of pursuing it? Focus group teachers believe they have the knowledge, but district mathematics program evaluations indicate there is little evidence of such pedagogical knowledge evident in classroom practice (see, e.g., Ai and Marsh, January 9, 2004).² Teachers say LUCI professional development provides much

² Ai, X., and Marsh, K. (January 9, 2004) *District Mathematics Plan Evaluation: 2002-03 Evaluation Report*. (Planning, Assessment and Research Division Publication No. 182). Los Angeles, CA: Los Angeles Unified School District.

knowledge, but they had few specific examples of teachers who attempted or actually implemented the practices promoted by the PD. We will revisit this puzzling set of information in Planning Implications, below.

Coach Experience with Role Definition and Functions

Coaches generally agreed with teachers' reports of role fragmentation and limited contact time with teachers. Coaches did articulate a potentially important impediment to coach-facilitated PD that was not mentioned by teachers. According to coaches, policies exist that give teachers considerable control over PD topics addressed as part of their school and professional improvement plans. Some said a state policy calls for increased teacher self-selection of PD topics. One coach said he thought it might be something the IfL encourages as a way of increasing teacher commitment to PD activities. Several indicated their principals have a set rule that teachers should collectively select PD topics half the time. Whatever the source of and rationale for the practice, coaches reported teachers rarely choose high quality PD. For example, mathematics teachers often fail to recognize the potential value of knowledge they lack, or teachers are reluctant to reveal gaps in their own content knowledge. Coaches say self-selected PD in all subjects appears to be of spotty quality from an instructional standpoint. Addressing this issue would require the involvement of actors beyond the MPG. Identifying and plugging PD productivity drains of this sort, if they exist, might indirectly increase the amount of high quality PD for mathematics by floating all boats a little higher.

One coach who reported high levels of administrative support and contact time with teachers was clearly seen by others as having lucked into an unusually supportive environment. This ground is covered above and in other district reports. The point we want to stress here is how important it will be for the MPG to help craft the circumstances under which coaches and teachers convene when coaches are ready to proceed with new PD activities.

Coach Experience Providing and Facilitating Teacher Professional Development

Coaches have many anecdotes that illustrate how they accommodate to principal and teacher expectations of, and receptiveness to, rigorous instructional coaching. Included are emphasizing logistical support, focusing on classroom management, and focusing on new and struggling teachers. The pressure on coaches to minimize instructional coaching combined with coaches' inclination to help where help is welcomed seems to result in too little time devoted to what some would argue should be their main function.

The picture is somewhat more encouraging when we turn to coaches' sense of efficacy and impact in situations where they have actually engaged in the kind of instructional coaching they would like to do more of. The story here is one of slow but real progress. This from the coach characterized above as having high administrative support:

It takes time to change. And teachers are all at different places. I have to keep bringing them back to table, pushing them in professional development, and in one-on-one conversation. I love the goal where we all want teachers to be. But I have teachers who used to talk all period who only talk 20 minutes now. Every year the students will benefit a little more.

Coaches also have stories of successes they have had helping support development of teacher capacity for standards-based instruction. Here is one example:

I also see a lack of teacher content knowledge in middle schools. High school teachers have all the content but not the pedagogy. Elementary teachers have the pedagogy, but not the content. I have quit trying to teach my teachers as though they are students and started having them do math together. I give them problems I know they can't do. They used to feign doing problems, but now relationships are stronger and they actually ask questions. They want to know more than one way to solve problems.

A simple but important related point is this: focus group coaches reported that they and many other coaches already possess the knowledge and skills needed to assist teachers in future PD activities as envisioned, for example, by the MPG. The implication is that barriers to success stem less from deficiencies in the technical knowledge and capacity of individual coaches and more from how other actors interpret district instructional priorities.

Coach Ideas for Modifying Professional Development and Reactions to Possible Future Activities

Coaches responded very favorably to the MPG idea of PD centered on helping teachers use assessment-like items as a jumping off point for in-depth classroom dialogue about important underlying mathematical concepts. One coach said the idea was "right on" and ought to be mandated. Others said it had much potential, but only if *not* mandated. All coaches agreed that district guidance and support would need to go beyond merely prescribing the practice to actually demonstrating it to teachers and supporting their efforts to enact the innovative practices in classrooms. One coach anticipated the zero-sum perspective of teachers in saying that the district cannot just insert a directive in the guide and expect it to happen. A second coach elaborated on this point, saying teachers will require much help understanding how such instructional practices can be reconciled with other signals perceived to be coming from guides. This connects to the earlier discussion of teacher perceptions of conflicting signals between textbooks and guides.

Some coaches indicated the proposed MPG strategy would provide a good foundation for coaches to extend and build on. One coach suggested having teachers meet to do problems and discuss relevant standards before addressing items with students. Another coach suggested teachers also collect student work samples from lessons and bring them back for discussion with colleagues and coaches. Although the need for one-on-one classroom coaching is considered substantial, coaches see the MPG strategy as a possible basis for increasing how much and how well coaches facilitate teacher professional learning in small groups.

Planning Implications. Most of the teacher and coach perspectives in this section underscore and elaborate on key points made earlier. The comment of focus group participants suggest to us that a central challenge is to help teachers achieve a more manageable and effective synthesis and expression of what are now seen as competing signals about instructional content and practices. At its December meeting, the MPG decided that a cover letter should go out with revised guides to explain the rationale for revisions and intended uses. The MPG also recognized

the need to provide considerable support to coaches and teachers if the district moves ahead with the strategy of helping teachers use assessment-like items as starting points for lessons that dedicate entire class periods to surfacing and addressing students' gaps in conceptual understanding. In view of teacher and coach comments, we see such MPG strategies and commitments as highly appropriate. Such steps seem to speak to a need among teachers for increased coherence, specificity, and consistency in district instructional guidance. If correct, perhaps more systematic communication of district instructional guidance goals, rationales, and strategies is a worthwhile goal.

We have described a marked tendency among focus group teachers to dismiss the feasibility of instructional innovation in light of what they see as a full-court press on content coverage. We noted a desire on the part of teachers and coaches for increased specificity in instructional guides, but a desire for guidance to be advisory instead of mandated. It seems a tall order, but we think valuable insights can be gained by reflecting on what this attitude may imply. Focus group teachers did not seem to be saying they were not interested in changing or that the district had no role to play in helping teachers make better choices about classroom instruction. But teachers see a big gap between what they think it will require of them to make major changes and the level of support teachers believe the district is willing and able to provide. Focus group teachers and coaches seem to be saying the district could put a big dent in teacher skepticism about district instructional guidance by helping teachers make sense of how to use instructional guides and textbooks in ways that enhance student performance on periodic assessments.

Conclusions

The *Executive Summary* and *Planning Implications* sections of this report contain summaries of the substantive issues addressed. We conclude with two observations we have from conducting, analyzing, and reporting on the focus groups. First, as researchers, we believe the quality of the exercise and the product it yielded was only improved due to collaboration across LAUSD and UW–Madison. Though IfL staff did not participate directly in conducting and reporting on focus groups, the IfL played an obvious and positive role in the broader process by working with the MPG to establish the need for and purpose of the project. In addition to increasing the value of the exercise in our own eyes, we sensed that teachers and coaches looked favorably on the fact that researchers from “inside” and “outside” the district were collaborating to better understand teachers' experiences and needs.

Second, we were struck with how useful it was to talk to coaches and teachers. Coaches appear to have valuable experience to draw upon for evaluating existing instructional improvement activities, and trouble-shooting possible new strategies. Teachers and coaches in seemed open to the idea of future discussions in focus groups or other formats. This is a valuable resource for planners and policymakers to have available to draw upon.