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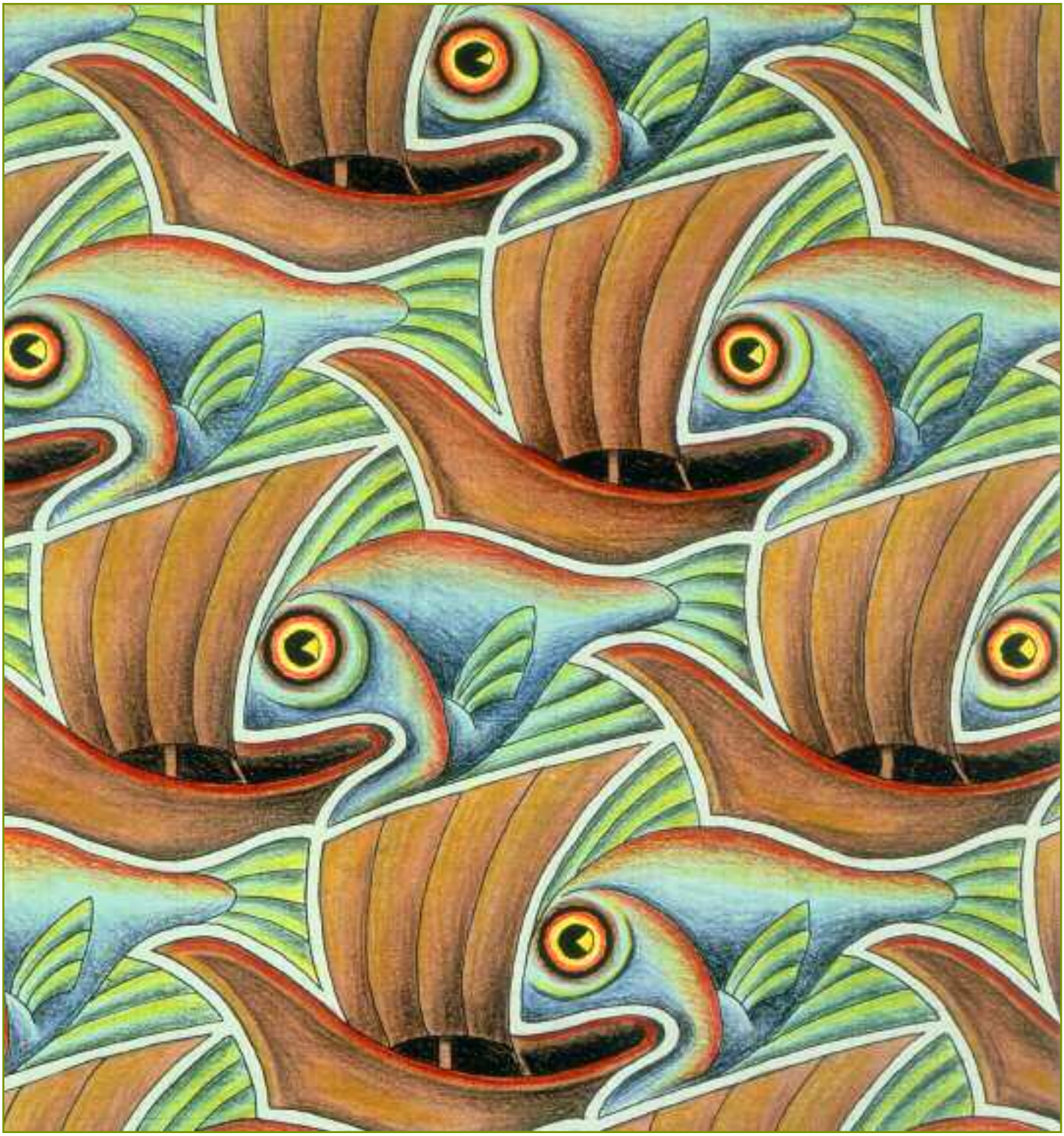

National Council of Supervisors of Mathematics www.mathedleadership.org

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Curriculum Leadership in Selecting Mathematics Materials

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Ann Foster walked down the aisle of publishers' booths at the National Council of Teachers of Mathematics regional conference in October, looking at the textbooks on display. In her new role as curriculum coordinator in the Riverside School District, Ann was responsible for overseeing the selection of new K–12 mathematics materials this year, and she expected it to be a challenge. The Riverside schools were deemed "in need of improvement" by the state's standards —with test scores falling just below the state's "effective" rating—and Ann was feeling great pressure to increase those scores. The current math textbooks weren't, in Ann's opinion, very well aligned to the state standards (and consequently, not very well aligned to the state test) and Ann had been looking forward to this year's opportunity to purchase new materials. She was particularly interested in some of the more innovative programs being used in a few neighboring districts, where they seemed to be having some success. However, the teachers in Riverside seemed largely satisfied with the textbooks they had; Ann suspected they would prefer the district buy the updated editions of their current textbooks. The K–12 materials selection committee —comprised of Ann and representatives from each of the Riverside schools—would begin meeting next week.

Ann has many questions about how to make a wise choice of materials. She believes that, in her district, textbooks play an important role in shaping what happens in the mathematics classroom, and therefore need to be chosen carefully. But what textbooks would be best for students' learning? What options should they consider? How would they know if they were effective? Who should be involved in choosing the new materials? Once chosen, how could she ensure that teachers would use them? What support would she need to provide to assist teachers in using the materials well? Where should she start? Ann and thousands of her colleagues across the country face similar questions each year in the process of choosing new instructional materials in mathematics. This article reports on a study[1] investigating the mathematics textbook selection process, discusses the role that curriculum leaders like Ann play in making those decisions, and offers an opportunity for mathematics supervisors to consider their own leadership in the textbook selection process.

How Do Districts Choose Mathematics Textbooks?

In order to understand the complexities and realities of how districts select mathematics instructional materials[2], we interviewed 150 K–12 mathematics curriculum decision-makers from districts in eight states. The states—Colorado, Louisiana, Maine, New York, Ohio, Texas, Washington, and West Virginia—represent a mix of state-adoption states (in which the state provides a list of approved textbooks and a timeline for adoption) and open-territory states (in which the choice of textbooks and timeline for selection is unrestricted by the state) across the country. The districts we selected for interviews within

[1] The authors are grateful for the National Science Foundation's support of the project, Effective Use of Mathematics Instructional Materials (Grant No. ESI-0454022) of which this study is part. Opinions expressed are those of the authors and not necessarily those of the Foundation.

[2] Although we recognize the potential for the terms mathematics instructional materials and textbooks to have different connotations, for the purpose of this paper we use them interchangeably.

each state reflect a range of characteristics in terms of performance level, geographic region, percent of students in poverty, size, and textbooks used.

Our interviewees were, in most cases, the person in each district directly responsible for overseeing the selection of new mathematics textbooks. They were typically mathematics supervisors, curriculum coordinators, department chairs, and assistant superintendents. Half of our interviewees were mathematics specialists; the other half held positions that cut across disciplines. For simplicity's sake, throughout this article we refer to these interviewees collectively as "curriculum leaders" though none held this title officially. Across our interviews, we sought to answer the following questions:

- What processes do school districts use in selecting mathematics textbooks?
- What factors shape those decisions?
- How does textbook selection differ in state-adoption and open-territory states?
- What research do curriculum leaders find most useful in textbook selection?
- What questions about mathematics textbooks do decision-makers need answered?

The curriculum leaders we interviewed described in detail the processes they used in choosing mathematics textbooks in their districts, as well as the influences on the design of those processes. The interviewees were, in general, thoughtful and thorough, and we are grateful for the candor and ease with which they discussed with us aspects of their jobs, their thinking, and their challenges. Their stories, out of necessity, often went beyond a strict focus on textbook adoption—as in many cases their efforts in these areas were intertwined with their strategy for improving student learning in mathematics—and they were generous with their explanations of how instructional materials related to their overall mathematics programs. It became very clear to us, through the interviews, the seriousness of purpose with which many curriculum leaders take their duties with respect to textbook selection. We found that most districts in both open-territory and state-adoption states follow an organized selection process with some complexity and substance. This finding may run counter to the popular perception that many textbook selections are made with little thought or effort; we found the opposite to be true.

The data gathered in these interviews has been supplemented by other sources, including a survey of the members of the Association of State Supervisors of Mathematics; a series of surveys of curriculum leaders nationally conducted by our collaborators at Inverness Research Inc.; an investigation of state-level documents and websites; and a review of the relevant literature. This data was analyzed first for each state individually to identify themes and hypotheses; we then looked across states to identify a set of claims in six key areas: (1) typical district selection processes; (2) the role of the curriculum leader; (3) factors that influence mathematics textbook decisions; (4) curriculum leaders' use of research and resources; (5) the role of instructional materials in mathematics improvement; and (6) supports for implementation. We then coded each interview, as well as the survey results, organizing the data available to confirm or disconfirm each possible claim. That coding also allowed us to identify the particular rationales offered by interviewees for their decision making.

This article offers primarily a discussion of our study's findings about the role of the mathematics curriculum leader in textbook selection, although we also touch on other areas.

The Role of the Curriculum Leader

The activities of curriculum leaders look remarkably similar, on the surface at least, across the variety of district contexts and grade levels we studied. The curriculum leaders we interviewed were, by definition, that person in each district responsible for designing, coordinating, and facilitating the selection process for new mathematics instructional materials. In a typical selection process in our study, the curriculum leader worked closely with an appointed committee, composed largely of teachers at the affected grade level, over a period of about one school year, to:

- ***Prepare for the selection process***, by reviewing district and state requirements, goals for the process, relevant district data, and recommendations from the field;
- ***Narrow the options*** by creating a "short list" of textbooks for evaluation;
- ***Evaluate those options*** in detail, by using established criteria, reading relevant reviews, visiting schools using the textbooks, and/or piloting the materials;
- ***Decide on a recommendation***, by consensus or by official vote; this recommendation almost always requires school board approval.

There were a number of commonalities in the role that curriculum leaders played in this typical process. This leadership role included such activities as inviting or appointing committee members, setting and sharing the criteria for selection, preparing teachers to participate in the process, identifying relevant research, and presenting the final choice of materials to a school board for approval.

Most curriculum leaders—about 80% in our study—collected and shared some information and resources to support the selection process. That effort took many different forms including researching potential options, identifying and sharing research on student learning of mathematics, finding efficacy studies on different program options, and collecting data from other districts on the use and effectiveness of the materials.

In addition to orchestrating these aspects of the process, leaders in our study saw one important aspect of their role as helping to keep the selection process focused. They did this by, for example, helping to orient the committee to what was important in the process:

> Before we looked at any materials we did a lot of research on standards-based mathematics. We had some speakers come from the state department to talk some about what's standards-based mathematics looks like…. And the elementary and middle school teams voted before we even began looking at materials, to only consider the ones that were standards-based materials.
>
> — *Curriculum and Technology Specialist*

Curriculum leaders also emphasized the importance of establishing criteria for selection. Such criteria, used by over 65% of our interviewees, helped keep committee members focused on essentials, rather than "neat features" of the books or freebies and gimmicks offered by publishers.

> When they [publishers' representatives] come in and they start showing you all the bells and whistles of their product, it's like, "Oh, we want it all! … You know, "Just give us everything." But when you're looking for those very specific criteria, we just had to say, "This one just does not have that."
>
> — *Assistant Superintendent for Instruction*

> We only look at the manual itself, the teacher's manual. We don't look at all the ancillary stuff. Because a lot of times teachers get distracted with the ancillary stuff. So we look at the textbook itself, the manual. If that gets us what we want, then we consider the others. But the other [stuff], that's the gravy.
>
> — *Assistant Superintendent, Curriculum and Instruction*

While virtually all of the leaders we interviewed were responsible for overseeing the choice and implementation of mathematics materials, as described above, there were significant variations in their roles. Some of these differences were directly related to their district context. The selection process in very small districts, for example, was much more likely to be informal, with less committee work and more choices made by individual teachers following fairly loosely-established criteria. In state-adoption states, the process was much more likely to be constrained by state guidelines that might dictate committee composition, prescribe particular selection criteria, or insist upon equal consideration of all vendors as a protection against corruption. Some districts in open-territory states had processes equally constrained by such policies, as a result, for example, of a union agreement that dictated textbook selection policy.

Beyond the influence of district and state context, the curriculum leaders we studied varied significantly in their choice of whether to reveal their own professional judgment in the evaluation of materials and to advocate for their preferred choices or to remain neutral with regard to the materials selected. This difference in approach is discussed in detail below.

Advocacy and Neutrality of the Curriculum Leader

One significant variation that we found in the role of the curriculum leader was the extent to which they chose to reveal their own perspective on the choice of instructional materials. This variation in role was dependent on restrictions in a leader's state or district context, and also appeared to be influenced by the individual's beliefs about the role of instructional materials. In our study, there were leaders who believed that the particular choice of materials was critical to the improvement of their mathematics programs, and accordingly, demonstrated greater advocacy within the selection process. However, there were also leaders in our study who chose to remain neutral in the selection process, leaving the particular choice of instructional materials to a teacher committee; this approach reflected a belief that the particular choice of textbook mattered less than the opportunity to build teachers' commitment to the materials selected.

What we found was a continuum of roles that curriculum leaders assumed in the process. We offer the following characterizations of leaders on this continuum with respect to their advocacy in the selection process. These characterizations include curriculum leaders who:

- ***Manage the selection process***, but maintain a neutral stance in the evaluation of materials and leave the decision to the appointed committee. Based on our data we estimate this to be about 30% of our curriculum leaders with this characterization being over twice as common in state adoption states
- ***Participate actively in the process***, offering professional expertise in the evaluation of materials, but leaving the final choice of materials to the appointed committee. According to estimates of our data, this is the most typical characterization, with 45–50% of leaders falling into this category.
- ***Advocate for particular materials or approaches***, on the basis of their professional expertise, and may in fact decide on the final choice of materials or greatly limit the options available to the appointed committee. We estimate that 20–25% of our curriculum leaders overall fit this characterization (although the approach was less common in state adoption states, with fewer than 10% of those leaders in this category).

We describe these three approaches in more detail below.

The curriculum leader manages the selection process, but maintains a neutral stance in the evaluation of materials and leaves the decision to the appointed committee.
Often, the role of leaders in this group during the selection process is defined by school board policy, which is in turn influenced by state policy or other restrictions that dictate that the choice of instructional materials must be made by a committee of teachers, or determined by teacher vote. Leaders in this group tend not to express their own personal preferences in the committee, believing that the process should be teacher-driven, and that their neutrality in the process is important. A mathematics supervisor describes her involvement in the selection committee:

> Now, they had some debates within their groups, but I stayed out of them. I did hear the discussions. But again, I stepped aside from that. I let them have that discussion… Tell me what you want. If they wanted to adopt one publisher, that was fine. If they wanted five different publishers, that was fine with me… And I told them that was not my objective, that I was not saying which way they needed to go… Because I wasn't the one that was going to be directly in the classroom using their book, they were. And as a result, I think they took me at my word, because we adopted four different publishers [for different high school courses], I think it is.
>
> — *Mathematics Supervisor 9-12*

Another curriculum leader related how school board policies specified the teachers' role in the decision about materials.

> We followed school board policy. And that was that a textbook committee would be formed, which we did. We had representatives from all six secondary campuses on our textbook committee. It also specified that teachers would have a say, up or down, in the final decision… We allowed every teacher to vote within their campus, and then there was a representative from the campus who came and represented that vote in the textbook hearing… And all that was kept in minutes and notes… As Curriculum, we facilitated the process but we did not really put our two cents into what book we thought was better. And quite frankly, the teachers were in a better position to make that determination anyway. They were the ones using the materials in their classroom to see what worked with their students. And while I attended textbook hearings, our director was very clear about the fact that he didn't want people to come back and say, "Well Curriculum picked the books for us." He wanted it to be a very good process where the teachers had most of the input.
>
> — *Secondary Mathematics Director*

In both of the examples above, the curriculum leader felt strongly that teachers should be making the decisions about instructional materials, because of their classroom expertise, and because they were ultimately the users of the chosen textbooks. In the second example, we see that the rationale for that stance included adhering to board policy, and a desire to avoid any perception of bias in the decision. The leaders in this group see their role largely as organizational and logistical and are committed to following district policy —ensuring that teachers have a strong voice in the process, that the process is fair and unbiased, and that the committee has what it needs to make a good decision. Given that it is much more common for state-adoption states to have policies in place that govern the textbook selection process, it was not surprising that this approach was more prevalent among curriculum leaders from state-adoption states.

Curriculum leaders who maintained a neutral stance in the selection process—not revealing their own perspective, nor relying on their own professional expertise in curriculum—still assumed leadership for planning and leading implementation activities. Critical implementation activities included ordering books, arranging professional development, designing implementation plans, and aligning the selected textbooks with district and state standards

The curriculum leader participates actively in the process, offering professional expertise in the evaluation of materials, but leaves the final choice of materials to the appointed committee. This was the largest group among the curriculum leaders we interviewed. These leaders may play a very active role, particularly in the early phases of the process, helping to orient the committee by sharing research on best practices for teaching and learning mathematics and articles on different curricular options, designing evaluation criteria, and keeping the committee focused and moving forward. They may share their own experiences and expertise about the instructional materials being considered but usually do not try to limit the committee's choices or make the final decision on the choice of materials. Their neutrality in the later stages of decision-making may come from a commitment to making a consensus decision, a wish to avoid perceptions of undue influence, or a desire to build teacher commitment to the choice of materials—believing that the latter is critical for effective implementation.

In the following two examples, the curriculum leaders view themselves as working collaboratively with the selection committee, but choose not to influence the final choice of materials.

> My role was really the facilitator, the person who attempted to set the tone for what to look for. The person who pulled people together for conversations and held them accountable for looking in depth and not just superficially at the material… Now our board policy, and from what I get a sense of, certainly in my previous district the same thing, it spells out that it is a teachers' selection process. So while I'm advising and pushing and providing as much possible light as I can on those materials that I feel are the best, it's still a teacher selection committee… I think it's a system of checks and balances to prevent districts from going with a coordinator's choice because possibly the coordinators had some hand in developing some materials. To keep it really egalitarian and keep it populist… If it's a collaborative decision I think those materials then have a better shot of being used and used wisely.
>
> — *Secondary Mathematics Coordinator*

> Well, my role is around curriculum, instruction, assessment, and I facilitate that group along with all the other curriculum groups. And hopefully I'm listening well and helping them make good decisions. I don't like to be that final decision. I want it to be truly what they seem to want. If we really have an issue around it, then perhaps the superintendent and I will work it out. But hopefully we try to facilitate the group in such a way that we really come to a consensus together.
>
> — *Director of Curriculum*

In the two examples above, the leaders clearly played a critical role in setting the tone of the discussions about the goals and materials considered in the process but limited their roles in the final decision-making because of a commitment to make a collaborative decision. This desire for consensus was driven in part by an acknowledgment that teachers' input is essential for effective use and implementation.

These curriculum leaders were often more willing to share their perspective or advocate for a particular instructional approach in the preparation, narrowing, and evaluation phases of the selection process, but assumed a more neutral stance in the final choice of materials.

> I don't want anybody to say, 'This is the program XX wanted.' I think it's more important for teachers to say, "This is the program teachers of the district wanted." I really feel strongly about that; it has to come from them. I'll certainly help coordinate and tell them programs that I know about, any research that I've done, or neighboring districts that have good test scores, you know I'll investigate that for them and find out the book and get the consultants in. But, to say this is the one I think is best, I won't do that.
>
> — *Mathematics Curriculum Coordinator*

Curriculum leaders in this category expressed reluctance to adopt materials that teachers did not find appealing—even if they believed those materials would provide a better student learning experience. They saw themselves as able to influence the selection process, but limited that influence, protecting the process as teacher-driven and attending to teacher preferences and judgments about quality of materials.

The curriculum leader advocates for particular materials or approaches, on the basis of their professional expertise, and may, in fact, decide on the final choice of materials or greatly limit the choices available to the appointed committee. The leaders in this group see it as their responsibility to share their professional expertise and judgment with the appointed committee. Therefore, they share their experiences with particular programs or instructional approaches, and view their role as contributing knowledge and information that would enable the district to make the best choice of materials for their students. These leaders described instructional materials as playing a critical role in their districts' mathematics program, and therefore, viewed the selection process as an important opportunity to improve mathematics instruction and learning.

In the selection process, these leaders' actions might include actively researching curriculum options; limiting the committee's choices to programs that take a particular approach; offering their opinions on and evaluations of particular programs, and in some cases, making the final choice of materials. In our interviews, these curriculum leaders described themselves as responsible for being knowledgeable about the research on student learning of mathematics, and on the effectiveness of various instructional approaches and curricular materials. Often, these leaders actively connected to colleagues in other districts and at regional and professional organizations, collecting data from other districts about their experiences with particular materials and their effectiveness for students and teachers.

It is important to note, however, that the interviewees who described an advocate approach to leadership did not disregard the input and commitment of the teachers with whom they worked. In general, they described going to some length to build teachers' commitment to the materials, by detailing their rationale for a preferred program, offering opportunities to pilot the program, or offering a choice of two similar programs. But their approach to textbook selection was driven primarily by attention to student outcomes, rather than teacher preferences.

In the following example, a curriculum leader described her role as an advocate in the selection process.

> Then what I did is I had a math curriculum committee, and I just got them talking… And it was grade level representatives. So we had a K rep, a One rep, you know, etc., etc.… And basically we talked about what we're doing and why we're doing it, and I was very blunt. I used [test] scores to show that we were in trouble mathematically. You know, you go to the data, and I said, "Woo, folks. We're walking this thin edge of barely meeting [state requirements]." And what we did is we started talking about… I encouraged some piloting. I wanted people to get, you know, dirty with whatever's out there. And I started getting concerned because, you know, I had too many people wanting to do a newer version of what they were using… I just said, "Why don't we just pilot the best of the best out there?"… And we piloted [two] this year…
>
> — *Curriculum Coordinator*

This curriculum leader used test data to build an argument for changes to their curriculum and instructional approach, and then narrowed the choice of pilot materials to the consideration of just two programs. Another leader described her thinking about her role in the process in the following way:

> My style is not to do the old style where we bring in seven publishers and they all get 20 minutes with the staff, and then we vote. We don't do that anymore. I work hours and hours behind the scenes doing research, reading what best practices in math are, what do we need to be looking for. What programs are successful where students are achieving well? And I look at the NSF projects, those are always high. What is the NSF saying about that? … I do the web searches now, and after awhile you begin to see some patterns emerging where the academic achievement of students, what mathematicians and people in that field are saying are good programs at this time. I gave the teachers, then, two choices. Trailblazers was one company; Everyday Math, they kind of get at the same thing with different companies. And then they chose …
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> — *Curriculum Supervisor*

Several interviewees described this approach as a change from a previously more neutral leadership approach, as does the interviewee above. This approach appeared to be emerging in response to increased accountability and growing urgency over improving student outcomes. Often, the curriculum leader's advocacy was paired with a move toward centralizing curriculum decision-making at the district level, as in the example below.

> We have been a district in "academic difficulty" since the designation was created. And part of the reason that we were there was because schools made those decisions

> locally. Every school had a different reading program. Every school had a different math program. There was no accountability…. Since the district was being [held] accountable for our rating, we needed to be accountable for the programs we were to implement. And so we changed that at the district. Five years ago we said that we would decide on the core programs in reading, math, science and social studies, what those materials would be. And we would be able to, then, better support the professional development that went along with that. And then we could do our own in-house assessments to see how well students were doing, and then we could make schools accountable for the implementation.
>
> — *Assistant Superintendent*

These curriculum leaders reported using the selection process as an opportunity to create greater consistency and greater coherence across grades K–12 in their district mathematics programs. They believed that a common textbook selection would ensure that teachers across a district are using materials closely aligned with state standards and test requirements and would enable a district to provide professional development linked closely to those materials. Consistent use of the adopted instructional materials and greater accountability for teachers' uses of the materials (e.g., through the use of common unit, quarterly, and benchmark assessments and pacing guides) would result in greater equity in learning opportunities in mathematics for all students.

We found leaders exercising greater advocacy in the process more commonly in open-territory states than in the state-adoption states in our study. We believe this is partly due to less restrictive policies, which would allow this approach. Also, in open-territory states, districts make selection decisions on different timelines, making it possible for curriculum leaders to observe the use of materials being considered in neighboring districts and to learn from the curriculum practices of other leaders.

Conclusion

Across these different approaches, virtually all of the curriculum leaders we interviewed acknowledged the importance of teacher input in the selection of textbooks, and viewed teacher commitment to the selected materials to be an important element of successful implementation. For many curriculum leaders, this led them to design selection processes that were highly dependent on a teacher committee's preferences and judgments about the quality of materials. In those processes, curriculum leaders either remained neutral or played a limited role in the evaluation of materials, depending on the restrictions of the district or state context. A significant minority of interviewees, however, described a different approach, in which they used their expertise in curriculum to identify and evaluate potential textbooks, offered opinions and professional judgments, and actively influenced decision making. These leaders were motivated to do so by an urgent need to improve student outcomes and by a belief that instructional materials could play a substantive role in doing so. They also operated in district and state contexts where this kind of advocacy was possible. Those processes were driven primarily by judgments about the quality of materials and their relative likelihood to influence student outcomes.

Regardless of their particular approach, curriculum leaders in our study were trying to meet and balance three important goals:

- The first goal was to ***determine which materials were the best fit*** for their mathematics program. Districts pursued this goal by checking textbooks' alignment with state standards; by establishing criteria for quality and analyzing textbooks accordingly; by reviewing student data to determine areas of need; and by looking for evidence—through piloting, research, or independent evaluation—of quality.
- The second goal was to ***build teachers' commitment*** to using the new textbooks. Curriculum leaders argued that if materials were not appealing for teachers to use—or if teachers did not believe they have input into the choice of materials—implementation would be less effective.
- The third goal was to ***ensure that the process is fair and transparent***. Districts protected against bias and corruption by seeking input from a range of stakeholders, considering multiple options, establishing criteria for evaluating textbooks on their merit, and looking for independent data as evidence of quality.

Each leader made deliberate choices about the design of the process based on the relative importance they placed on these three goals, influenced by their state and local contexts and their beliefs about the role that instructional materials should play in a mathematics program. Some leaders felt very strongly that it was their job to narrow the list, ensuring a choice of high-quality materials. Others felt their role was to prepare a committee and let involved

teachers make a consensus decision, building teacher buy-in. Still others were very careful to make the process as fair and transparent as possible. Regardless of which particular choices were made, what was clear in our study was that curriculum leaders had opportunities to make strategic choices about textbook selection and implementation and to use the process as a means for improving their mathematics programs. Those choices included:

- How selection committees are prepared to participate in the process;
- What criteria are used for evaluating the quality of mathematics textbooks;
- What role teacher input plays in the process;
- Whether the curriculum leader advocates for a particular approach or program;
- Which sources of information and research are introduced in the process;
- Which textbooks make the "short list" for further evaluation;
- How newly selected textbooks are implemented and supported; and
- How schools and teachers were held accountable for implementation.

As a curriculum leader you will likely find yourself in the position of facilitating the selection of new mathematics textbooks in your district. Whether that selection process is driven by pressures to raise mathematics achievement, to meet new state standards, or simply the need to replace old books, it brings with it the opportunity to improve your mathematics program. As you think about the decisions made by the curriculum leaders in our study, consider your district and the opportunity you have to use the adoption of new instructional materials as a vehicle for improvement of your mathematics program. What choices will you make about the selection and implementation of mathematics instructional materials in your district? Can you use the selection process to bring greater coherence to your district mathematics program, maximizing the potential contribution that new textbooks can make in mathematics program improvement?