CONNECTIONS

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Teachers Leading Teachers to Improve Student Learning

By Rachelle Feiler, Margaret Heritage & Ronald Gallimore

A research project at UES examines the role of the teacher leader in supporting school reform from within.

Public policy makers, unhappy about learning outcomes in schools, are pressuring teachers to make fundamental changes in their teaching practices. The typical workshop approach to teacher professional development, however, does not help teachers make the kind of long-term improvements that benefit children. So what *do* teachers need to make meaningful, sustained changes that will improve student learning?

Research has shown that one of the most effective means by which schools can achieve the changes reformers seek is collaborations among teachers, with peers serving as experts on particular areas of the curriculum (see also "Improving Achievement in an Urban Elementary School," in the Winter 1995 Connections). By supporting reform from within, schools may increase the likelihood that the improvement of teaching and implementation of curricular changes become an integrated, sustained part of the school's functioning. In our work at Seeds University Elementary School (UES), we have been studying the effectiveness of the role of teacher leader in helping to build and sustain an environment where teachers work together daily to improve their teaching, and thus student learning.

The Study of Teacher Leaders at UES

Teacher leaders serve as in-house experts who provide information, modeling, and support to other teachers. Through our experiment with teacher leaders at UES, we hoped to learn more about the challenges that teacher leaders face and the factors that support their efforts so that we might inform similar efforts in other schools. We wanted to know: (1) What elements of the teacher leader role are necessary to create and sustain change within the school? (2) What are the essential skills and understandings the teacher leader must possess to be effective in supporting change? and (3) What features of the school context can support or constrain the efforts of teacher leaders?

UES teachers were chosen for our project by the principal, Margaret Heritage, who was also a project researcher. Selection was based on teachers':

- **expertise** in one of the curricular areas chosen for school-wide focus;
- **leadership skills**—both the skills the teacher leaders possessed when chosen and the potential for their further development;
- **image among peers**—whether their peers would see the teacher leaders as experts in their curricular areas and accessible resources for information and assistance;
- **collaboration skills.**

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News & Notes…

Honors, Awards and Professional Activities of Members of the UESC

The **Gluck Foundation** has awarded a $160,000 grant to researchers from UCLA and practitioners from UES and the Santa Monica-Malibu Unified School District to develop the Early Literacy Institute, a program designed to help teachers identify and assist children with problems early in their schooling.

Alfredo Artiles, assistant professor of education, is co-author of the book, **"Reducing Disproportionate Representation of Culturally Diverse Students in Special and Gifted Education"** (Council for Exceptional Children). The book offers new perspectives for looking at children from different cultural backgrounds and suggests alternative ways to assess and teach them.

Psychology Professor **Terry K. Au** was awarded a three-year National Institutes of Mental Health grant for her project, **"Language acquistion: Timing and nature of input,"** which looks at whether early childhood experiences with Spanish (at home or in K-5 Spanish immersion programs) help adolescents/adults relearn the language.

Psychology Professors **Rochel Gelman** and **Jim Stigler**, along with seven colleagues, were awarded a National Science Foundation grant for their project entitled, **"Learning in Complex Environments By Natural and Artificial Systems."**

Change, the journal of the American Association for Higher Education, has named more than 80 people considered to be past, present and future leaders of higher education. Included in the list of **"young leaders" in academe** is GSE&IS Dean **Ted Mitchell**. The list is the result of 11,000 questionnaires sent to the higher-education community.

Professor of Education **Jeannie Oakes** participated in Vice President Al Gore's White House presentation of findings of a U.S. Department of Education panel on which she served. The final report of the **Hispanic Dropout Project** summarizes the panel's findings, data and recommendations based on its work nationwide.

The third edition of UESC Director **Deborah Stipek's** book**, Motivation to Learn: From Theory to Practice (**Allyn & Bacon), was recently published. The book has concrete suggestions and activities for teachers to increase students' motivation to engage in school tasks.

Call or Write for These UESC Publications…

- **Judging a school's reading program: A guide for perplexed parents** — Based on extensive research but written in plain language, this short paper outlines the "phonics" vs. "whole language" debate for parents and offers advice on choosing a reading program for children.
- **Improving Teachers' Practices in K-8 Mathematics: What Works?** — This 12-page report discusses successful strategies for helping teachers implement effective mathematics instruction.

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Using Children's Thinking to Teach Mathematics

by Megan L. Franke and Laura Weishaupt

Systematic patterns in the development of children's understanding of mathematics are revealed in the strategies children use to solve problems. Paying close attention to these strategies provides information that can help teachers guide instructional planning and interactions with children.

According to mathematics education reformers, students at all levels must be prepared to use mathematics as professionals do—collaborating to find solutions, discussing and debating findings, making conjectures, evaluating conclusions, and communicating results. In short, children should be engaged in "doing" rather than passively "learning" mathematics.

But to get children to "do" mathematics, to get them actively engaged in learning math, teachers must be able to help children understand mathematical concepts. Cognitively Guided Instruction (CGI), a research-based approach to teaching primary grade mathematics, does this by building on what children already know. It also builds on what we know about the development of children's mathematical thinking over time.

Knowledge About Children's Thinking

Research has shown that children enter school with well developed informal or intuitive systems of mathematical knowledge and that this knowledge can be used as a basis for the further development of children's understanding of mathematical concepts, symbols and procedures. When they are given the opportunity to solve problems with a choice of materials available, children as young as kindergartners can solve many addition and subtraction problems—even multiplication and division problems—by modeling the actions of joining, separating, comparing, grouping, partitioning, and the like.

The following example shows how one student, Rachel, used modeling to solve three problems that most adults would solve by subtraction alone:

T: "TJ had 13 chocolate chip cookies. At lunch he ate 5 of those cookies. How many cookies did TJ have left?

R: Puts out 13 counters, removes 5 of them, and counts the counters that remain. "There are 8."

T: "Good. Now here's the next one: Janelle has 7 trolls in her collection. How many more trolls does she have to buy to have 11 trolls?"

R: First puts out a set of 7 counters and adds counters until there is a total of 11. She then counts the counters she added to the initial set to find the answer. "Four."

T: "That's good. Here's one more. Willy has 12 crayons. Lucy has 7 crayons. How many more crayons does Willy have than Lucy?"

R: Makes two sets of counters, one containing 12 counters and the other containing 7. She lines up the two sets in rows so that the set of 7 matches the set of 12, and counts the unmatched counters in the row of 12. "Five more."

Note that Rachel did not take away to solve these "subtraction" problems. Instead, in the first problem she separated 5 from 13, in the second she added to the 7 until there were 11, and in the third she compared two quantities. Rachel's strategies reflect the actions described in the problems.

Children's strategies develop as they gain experience solving problems. For most children direct modeling strategies are replaced by counting strategies, which are essentially abstractions of the direct modeling strategies. A counting strategy for Rachel's second problem, for example, would be thinking 7 and then counting 8, 9, 10, 11 and keeping track of the counts (4) as she goes along. Then, as Rachel developed in her understanding she would be likely to solve the problem by using what she already knew about 10: for example, that $7 + 3 = 10$, that one more is 11, and that $3 + 1 = 4$. The continued development of more abstract symbolic procedures can be characterized as progressive abstractions of children's attempts to model action and relations depicted in problems. Eventually Rachel would see this problem as a subtraction problem and know 11 - 7 at the recall level.

How Do Teachers Use Children's Problem-Solving Strategies to Guide Instruction?

Using knowledge gleaned from the research and from conversations like the one with Rachel, CGI teachers create lessons designed to build on the natural patterns that occur in the development of children's understanding of mathematics.

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CGI Math

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Starting at the kindergarten level, CGI teachers ask children to solve a large variety of problems, usually related to a book the teacher has read to the children, a unit they may be studying outside of mathematics class, or something going on in the children's lives.

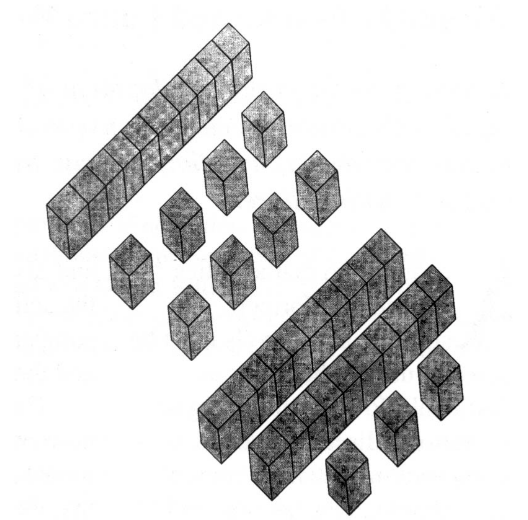
Work is focused less explicitly on the mastering of counting, basic facts, or computational algorithms found in more traditional classrooms. CGI teachers present problems that have been carefully selected so that children count by 1s, 10s or 100s depending on the child; discuss relationships between basic number facts; and invent procedures to manipulate two- and three-digit numbers. Through these experiences students learn the more traditional skills that are the focus of mathematics classrooms.

Various physical materials, such as base-ten blocks and counting frames, are available to children to assist them. Each child decides how and when to use the materials, their fingers, or paper and pencil; or to solve the problem by manipulating the numbers mentally. Teachers do not demonstrate solutions. Instead, each child solves the problem in any way that he or she can and reports to peers and the teacher what he or she has done. The teacher and peers listen and question until they understand the student's methods; then, the entire process is repeated. Using information from the demonstrations, the teacher makes decisions about what each child knows and formulates plans for instruction suited to the learning styles and needs of each student.

There is no one way to construct a CGI lesson. Rather, teachers construct lessons that allow them to use what they know about their students and the contexts in which they teach. Some CGI lessons make use of math centers, where children work with two or three other students to solve problems using geometry, graphing, or reasoning, write word problems, or engage in less structured exploration. Working with children in these small groups, the teacher can focus on a few students and interact with them as they search for solutions. She can adapt problems to individual students and provide appropriate support when it is needed. Such interactions provide the teacher with an opportunity to assess the strategies each child is using and follow up with questions and problems that might encourage a child to adopt a more advanced strategy if he or she thinks the child is ready.

Figure 1

Karen's ten-block representation of 18 + 23



Sample Problems— Ms. K's Classroom

A look into the combination first-and-second-grade classroom of Ms. K, a teacher in Madison, Wisconsin, serves as an example of CGI teaching. Described by James Hiebert and his colleagues in *Making sense: Teaching and learning mathematics with understanding**, this exchange is especially useful to illustrate how the teacher can help students uncover mistakes and use them to gain greater understanding.

Problem: Carla drew 18 pictures on Steve's cast. Dan drew 23 pictures, and Ms. K drew 37 pictures on Steve's cast. How many pictures did they all draw on Steve's cast?

A discussion with Karen. As students work to solve the problem, Ms. K talks to individual students about their solutions. She spends a great deal of time listening, letting each student provide a complete explanation of his or her strategy. In so doing she models the listening skills that she expects the students to develop and communicates to them that their strategies are important.

Karen, for example, has solved the problem in several ways and has gotten different answers. Ms. K works through her solutions with her, both to look for the error and to give Karen the opportunity to explain her strategies.

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* *Making sense: Teaching and learning mathematics with understanding (Heinemann, 1997) by Hiebert, Carpenter, Fennema, Fuson, Wearne, Murray, Olivier, & Human, is an excellent resource for understanding how mathematics lessons are constructed using CGI principles.*

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Karen: I got two different answers. On this one I got 70, and on this one I got 78.
Ms. K: Show me this one (points to the solution in which Karen got 70).
Karen: Eighteen and 23 is 41.
Ms. K: How do you know that?
Karen: I used the cubes (refers to the base ten blocks).
Ms. K: Can you show me what you did?

Karen puts out 1 ten-block and 8 ones blocks. She then puts out 2 tens blocks and 3 ones (see *Figure 1*).

Ms. K: So is there a mistake there?
Karen: No.
Ms. K: So now what are you going to do?

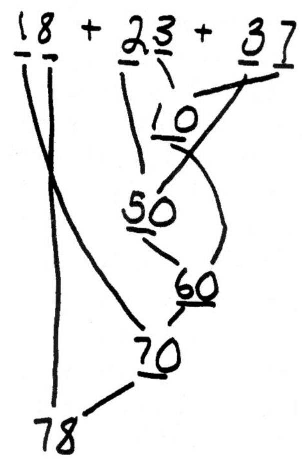
Karen puts 3 more tens and 7 ones with the ten blocks representing 41. She counts the tens, "10, 20, 30, 40, 50, 60." She then counts 10 ones and trades them for a ten bar. She continues counting, "70, 71, 72, 73,…78."

Karen: This time I got 78.
Ms. K: Why do you think this time you got 78?
Karen: Maybe I forgot the 7 and the 1 and just brought down the tens. (She appears to be referring to the 7 from the 37 and the 1 left over from combining 8 and 3 to make another ten.)
Ms. K: So now what are you going to do?
Karen: Do it again.

Karen then explains another solution in which she also used the tens blocks but first combined 18 and 37. Then she explains a third solution that involves much more abstract reasoning. Her representation of this solution appears in *Figure 2*.

Figure 2

Karen's solution to 18 + 23 + 37



Karen: Then on the last one, I added the 20 and the 3.
Ms. K: The 20 and the 3?
Karen: I mean the 20 and the 30. That made 50. I knew that 2 and 3 is 5, so 20 and 30 is 50. Then I added the 7 and the 3. That made 10; and 10 and the 50 that made 60; and adding the 10 from the 18, that made 70; and I added the 8 that made 78.
Ms. K: Excellent!

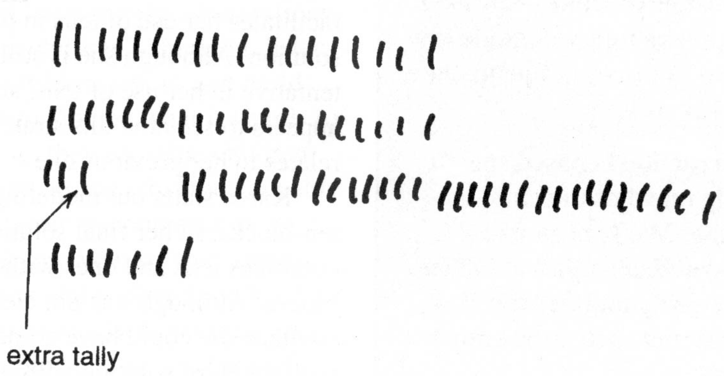
Sharing. After the class has worked for about 40 minutes on the two problems, Ms. K calls the students to the rug to share their strategies. The students read the problem aloud and Ms. K calls on Diana to share first.

Diana: I put 18 tally marks.
Ms. K: Can you show us?
Diana: [Draws tally marks on the board and explains as she does it.] I put 18, then 23. [Long pause as she draws the tally marks]. Then I put 37 [draws 38 tally marks]. Then I counted them all up.

Diana draws 18 tally marks in one row (see *Figure 3*). She then draws a row of 20 tally marks and three more tally marks just below it. She draws 30 tally marks in the same

Figure 3

Diana's tallies for 18 + 23 + 37



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CGI Math

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row as the three, leaving some space between the two groups. She then draws seven tally marks below the 30 and counts all of them one by one. Because the marks are close together, she makes a counting error. When she tries several times to recount, however, she gets a different total each time.

Throughout the demonstration Ms. K does not count the tally marks herself or ask one of the other students to do so. That would be taking Diana's solution away from her. The class might help her, but this is Diana's problem to work out.

Ms. K: What's hard about doing it with all those tally marks?

Susan: They are small and you might count one twice.

Aaron: You could cross them out as you count.

Beth: Another way would be to get an abacus. It would be easier with something bigger than those tallies.

Ms. K: Do you want to try it with something else and then come back?

Diana: Yes.

Ms. K: OK. Pick someone else who did it a different way. [Diana picks Karen, who has her hand up.]

Karen: [She draws a tree diagram (*Figure 2*) on the board and provides the following explanation as she draws it.] First I added the 20 from the 23 and the 30 from the 37, and that made 50. Because I know that 2 and 3 is 5, so 20 and 30 will be 50. Then I added the 7 and the 3 together. That made 10. I added the 10 and the 50, and that made 60. And then I added the 10 from the 18; that made 70. Then I added the 8 with the 70. That made 78.

Ms. K: Any questions for Karen? [Pause as she waits for questions] Karen, will you pick someone please?

After several other students share strategies, Diana returns and Ms. K gives her the opportunity to share her new solution. This time Diana uses the counting frame. She makes 18 by first moving over the top row of 10 without counting and then counting out eight beads in the second row. She counts the 23 beads one by one. She then makes the 37 beads by moving three tens and then counting seven ones. To solve the problem she counts the tens by ten ("10, 20, 30, 40, 50, 60") and then counts all the rest by ones ("61, 62, 63,...78"). Thus, in solving the problem, Diana sometimes uses her emerging knowledge of tens to help her count, and sometimes does not.

When questioned, Diana says this new way was easier than using the tally marks because the beads "were bigger." She does not mention that the counting frame helped her to use tens to count and keep track, but Ms. K does not push that issue at this time and the class moves on to another problem.

The Role of the Teacher. The lessons from Ms. K's classroom illustrate the distinctive qualities of the CGI teacher's role:

1. **Ms. K does not teach the strategy; she gives children problems to construct on their own.**
2. **Ms. K does not show the child her mistake—she asks questions that will guide the child to discover the mistake on her own.**
3. **Instruction is based specifically on what the child is doing. Ms. K organizes instruction so that children can easily and actively construct their own knowledge.**
4. **Peers are actively involved when the child is presenting her solution.**

Note that it is especially important for CGI teachers to analyze children's thinking by asking appropriate questions and by *listening* to children's responses. Teachers must assess not only whether a child can solve a particular problem but also *how* the child solves the problem. This helps teachers know where students are moving in their mathematical understanding and aids them in designing instruction suited to this understanding. Likewise, it is important to engage the whole class in the discussion so that each child's explanation of her strategy becomes a learning opportunity for all children in the class.

Learning With Understanding

Ms. K's classroom shows how instruction can offer a variety of opportunities for students to connect emerging concepts with strategies that already make sense to them. The interactions with Diana and Karen show two students on the verge of developing more advanced strategies. Although Diana's initial strategy makes minimal use of base-ten concepts, it does show some emerging understanding of ten as she separates the tallies representing 20 from those representing the ones, and the 30 tallies from the seven. When Diana uses the counting frame, the ten-structured organization of the counters on the frame facilitates her use of tens in her solution. Although she is still quite tentative in her use of tens, she appears to see how this strategy relates to her previous one.

Karen starts out modeling with ten-blocks. In her final solution she combines tens and ones without the blocks. Although it is not clear whether she could have come up with the third solution without first solving the problem with the blocks, by the time she shares she is able to

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describe the strategy without using or even referring to the blocks. The invented algorithms that a number of the students in Ms. K's class use are essentially abstractions of the blocks procedures. By reflecting on the blocks procedures and talking about them, students become aware of the actions on the blocks and can think about these actions at an abstract level—combining the tens, combining the ones, etc. The manipulations of the blocks become objects of reflection so that the students can operate on the numbers without having to manipulate the blocks. Karen appears to be going through this transition.

A Final Word

CGI teaching is just one example of reform-minded mathematics instruction. Becoming adept at implementing such instruction is not done overnight, nor is it accomplished by the end of a workshop. It takes time and interaction with children to learn the methods and incorporate them into a classroom. Research has shown that the more teachers use children's strategies to gain an understanding of individual children's thinking and ability, the more important this understanding becomes to teachers. Teachers who use the principles of CGI, for example, increasingly ask questions that elicit children's thinking, listen to what children report, and build their instruction on what is heard. As they do so, they see what children are able to do and what they are able to learn given the opportunity to engage in problem solving appropriate to their ability. For these teachers their classrooms become sites for their learning and the learning of their students.

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Need A Helping Hand With Cooperative Learning?

"The Helping Behavior Activities Handbook" offers a collection of activities to help prepare students for cooperative learning. Compiled by Sydney Farivar and Noreen Webb, the handbook was developed in during the course of a research project funded by the National Science Foundation to investigate cooperative small-group problem solving in middle school mathematics. The activities in the handbook were designed for use in both middle and elementary schools. To obtain a copy, contact Noreen Webb, Department of Education, UCLA, (310) 825-1897, or e-mail: webb@ucla.edu.

Teacher Leaders

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Principal Heritage provided professional development opportunities for the leaders, which included explicit guidance in time management, skills for facilitating meetings, and strategies for facilitating the development of peer teachers. She also assisted the teacher leaders in developing goals for their work and provided feedback from her observations of the leaders' work with other teachers.

> ***"Teacher leaders provide information, modeling, and support to their colleagues ."***

During the year of our study three teacher leader roles were active: Technology Coordinator, Bilingual Coordinator, and Mathematics Coordinator. Each coordinator had one day's release time from his or her teaching responsibilities each week to accomplish a variety of tasks. During release time teacher leaders met with the principal to discuss their work and set new goals, observed other teachers' instruction and provided constructive feedback, and met with teachers to plan lessons or discuss student achievement and curriculum. They also used the time to enhance their own knowledge and skills by attending conferences, researching new curriculum, and seeking assistance from outside experts.

The teacher leaders we studied interacted with other teachers in different ways depending on factors such as the subject matter they supported and the teacher leader's personal style. All worked with individual teachers to discuss concerns about individual students, demonstrate lessons, and provide resources and materials for lessons and assessments. Because the purpose of any school change effort is to improve students' learning and achievement, all these interactions had as their ultimate goal improved learning and achievement for children.

The **technology coordinator** most often worked with small groups of teachers who had common needs or interests, and with individual teachers who wanted to accomplish particular goals involving technology in their classrooms.

For example, in the beginning of the year the technology coordinator sent teachers a survey asking how they wanted to use technology in their classrooms and what computer applications they wanted to learn. After finding that a group of teachers wanted to learn how to use a scanner, she met with them regularly to teach them the necessary skills in a meaningful context. Teachers in the work group used HyperStudio to set up assessment portfolios for their students' math lessons, scanned the children's work into the portfolios, applied a scoring rubric, and recorded children's scores. This interaction with teachers was especially effective because it built on what the teachers already knew (i.e., the use of HyperStudio) to give them new skills and also demonstrated strategies for integrating technology into the curriculum.

> ***"Everyone assuming a leadership role has to develop a firsthand, school-wide view of their area of the curriculum at each grade level."***

The **mathematics coordinator** often co-chaired with the principal whole faculty meetings focused on mathematics instruction in the school. At one meeting, for example, the coordinator led a discussion of how a particular mathematical concept could be developed at each grade level. In another meeting she shared the results of a school-wide assessment of children's skills so that the entire faculty could discuss the results and what they meant for instruction throughout the school.

At other times the coordinator attended level meetings or worked with individual teachers. She initially spent much of her time obtaining and bringing to teachers materials and resources to aid their teaching—a role that limited her opportunities to work closely with teachers. Once everyone was up to speed, however, she was better able to assist teachers in using the materials and resources effectively to meet their goals for instruction and student achievement. This evolution of the mathematics coordinator's role demonstrates the importance of the teacher leader's ability to adapt and to provide what teachers need.

The **bilingual coordinator** led the group of teachers whose classes were part of the Learning in Two Languages (LITL) program. He chaired group meetings, worked with individual teachers, supervised language assessments, and also met regularly with the LITL parent group. Enhanced communication with parents became an especially important part of his role. For example, by organizing a parent night with small-group sessions on

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topics such as second language acquisition, he was able to provide information about the program that aided parent support of children's learning. This kind of parent involvement and understanding of the instructional program is critical for reform. Teacher leaders can play a role in developing such important connections.

Our Study

Because this was the first time the role of teacher leader had been tried at UES we weren't sure how it would work. We did a qualitative analysis so that we could identify issues and analyze our mistakes so they might serve as a guide to other schools experimenting with this role. We gathered qualitative observations of the leaders as they met with the principal, worked with other teachers, and engaged in other leader functions such as researching materials and planning for meetings. In addition, interviews were conducted with each leader and six other teachers at the end of the school year. The principal was an additional source of information and provided her perspective on the work of the leaders and their functioning within the school context.

> ***"Teacher leaders need time to grow into their role and evolve an effective way of working."***

What Did We Learn?

(1) Focus on student learning.

The focus of our effort was to improve student learning, but we found that it was easy for teacher leaders and the rest of the school community to become distracted from that goal by the many small issues that come up on a daily basis.

Also, we found that discussions about administrative or other issues easily distracted the group's attention during teacher meetings that were intended to focus on the curriculum. We found that providing teachers with a written agenda was helpful in steering conversations and keeping attention focused on the goals of teacher meetings.

(2) Teacher leaders must have the opportunity to gain a school-wide perspective.

In our project it became clear that to understand what needs to be accomplished and to be effective in achieving school-wide goals, everyone assuming a leadership role has to develop a first-hand, school-wide view of their area of the curriculum. They also must understand the teaching approaches and skill level of each of their colleagues. In fact, the success of our teacher leaders' efforts were, in large part, related to the amount of time they spent in classrooms either observing or working with other teachers and their students. It was immediately evident that without adequate release time from their classrooms, teacher leaders could not do their jobs successfully.

> ***"The success of our teacher leaders' efforts were, in large part, related to the amount of time they spent in classrooms either observing or working with other teachers and their students."***

(3) Teacher leaders must have credible expertise and skills.

Teacher leaders need an extensive repertoire of skills to be effective. Above all, they must be experts in their area and be perceived by their colleagues to have a depth of knowledge in their subject area. Teacher leaders in our project were most successful when they had a strong track record as a teacher and an ability to work with the entire age range of students in the school.

We also found that teacher leaders needed to increase their professional knowledge on a continual basis so that they could continue to grow and to provide the most up-to-date information to teachers. Two of the ways teachers in our project did this were by attending conferences on the latest curricular innovations and seeking assistance from experts outside the school. The bilingual coordinator, for example, consulted with second-language acquisition experts from the Los Angeles Unified School District who had dealt with some of the same issues he was confronting at UES.

(4) It takes more than curricular expertise.

In addition to professional knowledge, teacher leaders must also develop the ability to effectively "press" their colleagues to change, to acquire new skills, to do things differently. Their colleagues, however, also need to feel both confident and comfortable with the teacher leader. Teachers at UES reported feeling threatened or challenged by change efforts. Our teacher leaders needed to be skilled in how they worked with individuals and how they managed groups. We found that teacher leaders were most successful when they used a combination of persistence and patience—

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persistence in challenging their colleagues to develop and patience with the process.

(5) It takes time to evolve the role.

We found that teacher leaders need time to grow into their role and evolve an effective way of working. Even though teacher leaders in our project began their function possessing many skills, there were other skills and understandings they needed to develop within the context of the role. These included observational skills, which are important to teacher leaders' work but are seldom well developed in classroom teachers. Their colleagues also needed time to become comfortable with the teacher leaders and see the potential for using them as a resource. Our study was conducted during one school year. We found that it took until the end of the year for leaders to be truly effective in promoting instructional improvement. For all these reasons, we recommend keeping the same people in the role of teacher leader for more than one school year.

> ***"Above all, teacher leaders must be expert in their area and be perceived by their colleagues to have a depth of knowledge in their subject area."***

(6) Work toward clarifying the role early on.

Some classroom teachers did not make full use of each teacher leader's role simply because they did not understand all of its functions. For example, in end-of-the-year interviews, one teacher reported that she didn't make use of the math coordinator because she didn't understand that part of the role was to assist individual teachers in the classroom (by demonstrating lessons, observing students, etc.). The teacher thought the main purpose of the math coordinator was to provide and discuss materials.

(7) The principal's role is key.

The principal plays a key role in the functioning of the teacher leader in many ways. First, while the leader can assume responsibility for promoting the school's goals within his or her own area of expertise, *the principal is responsible for maintaining the overall vision for the school and coordinating the resources and work of the school's faculty to accomplish goals in many areas*. In our observations of the interactions between the principal and individual leaders this was often a process of negotiation, where the principal and leader co-constructed the goals the leader would work toward in the short term. The leaders made recommendations for specific topics for the faculty to address, suggested directions for their own work, or brought particular needs within the school to the attention of the principal. The principal would confer with the leader and sometimes make decisions based on resources—determining, for example, how many new computers could be purchased or allocating time during busy pupil-free days for a leader to work with teachers.

In addition to maintaining the school's overall vision, *the principal must provide accountability for the teacher leader*. With so many responsibilities, the teacher leaders we studied often felt pressured to use their time out of the classroom to accomplish tasks that were not related to their leadership responsibilities. Parent conferences, lesson planning, conferring with students, and assessment all took their toll on the leaders' time. To balance these legitimate time constraints, the principal used her weekly meetings with the leaders to review the leader's progress toward his or her goals and to establish new goals for the coming weeks. This check-in, accompanied by the opportunity for the leader to receive feedback and discuss concerns, helped keep the work of the leaders on target and progressing.

Along with accountability, however, *the principal must provide the necessary support for the teacher leader to function effectively*. One potential drain on a teacher leader's effectiveness can come from having too many administrative duties. Each of the teacher leaders we studied reported spending time on administrative tasks (e.g., paperwork, ordering materials, writing reports), which diminished the amount of time they could work with other teachers. Although in some situations the leader is the most logical person for the task—particularly ordering materials or coordinating arrangements for teachers to attend relevant conferences or lectures—the principal can provide administrative assistance to minimize the impact of such tasks on the teacher leader's time.

> ***"The work of teacher leaders, like any reform effort, is a process of experimentation."***

Even if teacher leaders are not burdened with administrative duties they may be hampered in their work if, as happened at UES, some other

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teachers see them as the "eyes and ears of the principal". Some teachers might choose not to share their concerns with a leader or want the leader to visit their classrooms for fear that information that might reflect poorly on them would reach the principal. Other teachers may deliberately share concerns with the teacher leader, expecting the leader to serve as an advocate or mediator between them and the principal. To prevent other teachers from perceiving the leader in this way, the role of the teacher leader must be clearly understood by the whole faculty, and *the principal must effectively communicate and reinforce its purpose and function.*

Finally, *the principal has primary responsibility for developing the leadership skills of the teacher leaders*. Although leaders' expertise in their curricular area may exceed that of the principal, most classroom teachers will require the assistance of the principal to develop greater leadership skills. Much of this professional development for the leaders can be embedded within their weekly meetings with the principal. The principal may also serve as a model for the leader, as the UES principal did when she co-chaired faculty meetings with the mathematics coordinator.

In some cases, a school may not have a teacher who is expert in a subject matter area. When this happens, we have found it is better to nurture a teacher to gain the expertise than to implement the coordinator role with a teacher who is not an expert.

In Conclusion

Merely creating the role of teacher leader and the time for teachers to assume it is only the first step. To make this an effective strategy for ongoing instructional improvement requires careful planning, leadership development, and a continuing support system. Although change efforts can be amplified by involving teachers in leadership roles, these efforts will be effective only if the principal is involved on a continuing basis.

Our preliminary study of the role of teacher leaders at UES has provided some insight into the essential elements of the teacher leader role and the context needed to

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ensure that leaders function effectively. While the leaders' work was probably facilitated to some degree by the laboratory context of UES, the issues we have identified here are relevant for any school that attempts to utilize teacher leaders to support instructional improvement. Perhaps one of the most important lessons we learned is that the work of teacher leaders, like any reform effort, is a process of experimentation. Not every effort of the leaders will lead to improved student achievement, and change does take time. Even as the development of the leader role continues at UES we hope to work with other schools to implement similar development efforts aimed at creating change that benefits student learning.

For Further Information

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