

*Preparing and Deploying Professional Development Providers*

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The MASE K-5 Using Technology project serves Clark County School District in Las Vegas, Nevada. Clark County School District, covering over 8000 square miles, and serving over 280,000 students K-12, is the 5<sup>th</sup> largest school district in the country located in one of the fastest growing urban areas nationwide. The annual 6% growth rate in Clark County creates the need to hire an average of 1400 elementary teachers annually. An average of 14 new schools open each year providing teachers and administrators with the opportunity to change school assignments.

With the school as the unit of change, the MASE K-5 Using Technology LSC provided focused professional development for 1033 teachers in 32 of the 189 elementary schools in the district. Within the 32 elementary schools in the LSC, 57% of the administrators and 49% of the teachers who began with the LSC in 2000, have been assigned to positions outside the project. A gap developed between the professional development needs of experienced and less experienced teachers within the project schools as teachers, administrators, and teacher leaders moved around within the system. District mobility issues impacted the teacher leader development process, a strategy utilized within the project to build capacity and sustainability and presented unique challenges in sustaining focused professional development and in building capacity.

Professional development within the project was provided by Teachers on Special Assignment (TOSA), consultants, and teacher leaders. Participants attended initial use workshops designed to introduce the pedagogy and content of FOSS or Investigations in Number, Data, and Space materials. Support for implementation was provided at the school site by experienced classroom teachers, project staff, and administrators. As teachers became confident using the materials with their students they selected from a menu of workshops and institutes to continue their professional development in mathematics and science. Offering multiple professional development sessions challenged the capacity of project staff to address the diverse needs of the project participants. Teacher leaders were needed to support entry level professional development, enabling project staff to focus on experienced teachers. Building leadership capacity at multiple levels was a strategy that became central to the project.

The Teachers on Special Assignment functioned as a community of learners posing questions about their work with teachers and pursuing these questions through active research in the classrooms and schools. They formed study groups to read books and articles, and attended professional development for their own growth. The design of professional development was often accomplished in partners or teams in which the session outline was created through discussion of lessons learned and reference to research. Debriefing the professional development sessions was common among the team often resulting in revision of the sessions. The TOSA demonstrated strong understanding of inquiry-based teaching and thorough knowledge of the content of FOSS and Investigations in Number, Data, and Space curriculums. They employed an understanding of the system constraints within which the project functioned, an understanding of adult learners, and a passion for teaching and learning. Their focus on children and the belief that all children can learn mathematics and science was foundational to their success. The TOSA was the heart and soul of the project. This talented team of four educators were assigned to the curriculum division without regular classroom responsibilities. The outside evaluator for the LSC was a partner in the process of reflecting and guiding professional development design. The opportunity to work

closely with nationally recognized consultants in math and science professional development was highly valued by the project staff. Teachers on Special Assignment learned with and from a national community through participation at conferences, seminars, and institutes.

Teacher leaders provided professional development across the project while maintaining full-time teaching responsibilities within their classrooms. The teacher leaders understood adult learners, possessed knowledge of content and inquiry-based teaching and learning, and were willing to take risks with their own teaching. They were open to questions and committed to changing the way teaching and learning occurred within the mathematics and science classrooms. They believed all students could learn math and science and that it was their responsibility to figure out what the students needed and how to support learning. They led by example, shared their experiences, and welcomed inquiry into their teaching as they worked with teachers. The teacher leaders were curious practitioners who pursued their own inquiry about teaching and learning. Their natural questions came from work with children and the desire to help all children learn mathematics and science. They wanted to learn as much as they could to be successful in the classroom. The formal process of mentoring to prepare teachers for leadership was supported by work with the consultants, experts, and scientists. This tiered leadership development involved all learners at multiple levels, learning together to improve classroom practice.

Consultants and university faculty brought diverse perspectives to the project, reinforcing current research and best practices from their experiences nationally. They were committed to the project goals and sincere in their efforts to support the teaching and learning of mathematics and science outlined in the project. As consultants collaborated with project staff and teacher leaders, leadership developed at multiple levels. Continuous interactions between the consultants, project staff and teacher leaders strengthened the teachers' understanding of content, pedagogy and inquiry teaching and learning. Consultants and university faculty, in partnership with project staff, designed and implemented mathematics content sessions. Teacher Leaders attended these content sessions, strengthening and applying increased understanding of mathematics content to their classroom instruction and professional development sessions.

MASE K-5 Using Technology professional development was a practice-based model, focused on student-centered teaching and learning. Professional development sessions for project participants were designed, implemented, and evaluated through collaboration between project staff as Teachers on Special Assignment; classroom teachers as Teacher Leaders; and consultants, scientists and university faculty as content experts. Each partner in the collaboration was at times a learner, a teacher, a mentor, an expert – all were engaged in their own inquiry into teaching and learning around student thinking.

The role of the Teachers on Special Assignment changed from year to year as the needs of the teachers within the LSC grew and changed. In the first few years, their role included designing, implementing and evaluating professional development sessions largely focused on initial use of the FOSS or Investigations in Number, Data, and Space materials. Discussions with the evaluator and administrators supported what the project staff observed during their work with teachers in the schools. The implementation of the standards-based instruction in both science and mathematics was procedural and teacher-centered. Teachers were following the materials in the units and modules, but were not connecting with what the students were learning. Implementation had reached a plateau for many of the experienced teachers. Second level professional development designed to move teachers toward insightful implementation of the materials focused on student thinking was needed. The need for increased capacity within the professional development providers became evident as the Teachers on Special Assignment

simply could not continue to facilitate all the initial use workshops as well as design and facilitate the second level trainings.

The project staff designed and implemented a second layer of professional development for teachers who were experienced with the materials and ready to move their practice to a more insightful level of implementation. The *Insightful Use Workshop* for Investigations and FOSS was designed around two goals, 1) to focus teachers' instruction on student thinking, and 2) to prepare teachers from each grade level to assume a leadership role with their grade level teams. Teachers utilized the HRI Classroom Observation Protocol to examine lesson content, classroom environment, and implementation of lessons.

Through the evaluation and revision of the workshop design, the *Insightful Use Workshop* evolved into *Observing for Evidence of Learning* (OEL). OEL focused on observing for evidence of student learning during the lesson. Teams of teachers from each grade level within the school attended a two-day session facilitated by Teachers on Special Assignment to prepare them for facilitating the OEL process with their grade level teams. Collaborative processes including group norms and roles, learning how to utilize the OEL protocol for classroom observation, and lesson design including emphasis on lesson content were the focus of the OEL sessions. Teams enthusiastically embraced the process and began implementing OEL with their colleagues – another step toward building leadership capacity.

Leadership capacity developed as Teachers on Special Assignment mentored teachers to become teacher leaders. Teacher leaders were identified through recommendation of the project staff, the site administrator, or by self-selection. The project staff developed relationships with the teachers as they facilitated initial use workshops and visited classrooms. During these interactions, the project staff determined interest, knowledge, and readiness of teachers to engage in teacher leadership.

The site administrator supported teacher leaders as they assumed extra responsibilities outside their classroom and school realizing that as these teachers enhanced their practice through leadership development they became a resource to the school. Teachers who were interested in becoming administrators recognized the role of teacher leader as one which would provide experience working with many teachers, build deeper understanding of math and science curriculum and instruction, and provide an opportunity to experience facilitating the change process. Others simply were passionate about teaching and learning, and finding success in their classrooms as they implemented FOSS and Investigations in Number, Data, and Space wanted to support teachers with becoming facilitators of inquiry learning within their classrooms.

Teachers on Special Assignment or experienced teacher leaders teamed with classroom teachers to develop professional development leaders. Teacher leaders participated as learners, translating their learning into practice within their classrooms. As their practice evolved, teacher leaders began to work with the project staff to design professional development sessions and observe these sessions through the lens of a facilitator. Collaborating with project staff to facilitate sessions, teacher leaders ultimately assumed full responsibility for facilitating PD and finally mentored other classroom teachers to become teacher leaders.

The role of the teacher leaders evolved over the past five years from providing workshops across the project to supporting schools with on-site professional development. As professional development within the project shifted from initial use to insightful implementation, the role of the teacher leader shifted also. Project staff began to support development of the leadership within each school and grade level team in order to create a culture of ongoing professional development and capacity to sustain the use of standards-based instruction at each school. Collaborating with the site administrator, existing teacher leaders and grade level teams, teacher leaders within each

grade level became the core leadership team for math/science within the school. The leadership team's role was to insure that 1) teachers new to the school had professional development on initial use of the materials; 2) all teachers had the opportunity to continue math/science professional development toward insightful implementation; and 3) project staff was utilized as a resource for the school team's continuing leadership development.

Utilizing the *Bridges to the Mathematics Classroom: Investigations in Number, Data, and Space Unit Guides* as a resource, the project staff modeled facilitation of study groups and supported the grade level teacher leaders as they implemented study groups with their colleagues who were new to Investigations. Project staff developed a module guide and offered the study group process for teachers new to FOSS. Experienced and inexperienced teachers engaged in rich conversation around implementation of the units or modules. From these grade level conversations and teachers questions, additional study groups formed around topics such as the use of notebooks in math/science, standards-based assessment and grading, establishing a classroom environment, and increasing teachers' content knowledge in mathematics or science. The Teachers on Special Assignment interacted with the study groups, offering support as needed. The study group structure evolved over the course of a year and by the second year, school teams were able to facilitate their own study groups with minimal support from the project staff. Site-based professional development emerged through the study group process.

The Advisory Board engaged project staff, administrators, and national experts in science and mathematics education through reflecting on the project, raising questions, challenging directions, building program, and strengthening the project while increasing the knowledge of the staff. Identification of the advisors occurred through long-standing partnerships within the mathematics and science education community.

Scientists were identified through collaboration with community partnerships that developed over time. Consultants were invited based on project needs, worked with project staff to design and implement professional development and became partners with the project staff and teacher leaders returning periodically to work with teachers and staff.

One of the most valuable resources for all levels of leadership development has been that of the consultant. The goals of the project defined the role of each consultant. Some consultants provided workshops attended by all teachers. These experts modeled reflective practice, posed questions, guided learning through testing ideas within the classroom, evaluated teacher and student learning through discussion, and instilled the culture of inquiry into project participants at all levels.

The *Teacher Leader Institute* brought consultants, project staff and teacher leaders together for two weeks in the summer to develop initial use workshop leader guides for FOSS and Investigations in Number, Data and Space. The consultants guided the project staff and teacher leaders to articulate the story lines of each unit, identifying key math or science concepts within the unit and design an engaging series of professional development experiences that would prepare teachers to begin implementing standards-based materials in their classrooms. The consultants continued working with the project staff and teacher leaders throughout the school year, refining the design of the workshops.

To develop expertise with analyzing student responses on open-response mathematics assessment items, consultants paired with project staff to facilitate the session for teacher leaders who then became lead scorers for their school teams. This model continued until the project staff gradually fulfilled the consultant role, the teacher leaders took on the role of the Teachers on Special Assignment, and new teacher leaders were prepared to facilitate the scoring at their schools.

The *Inquiry Institute* involved the consultants as content experts who, along with TOSA and teacher leaders, designed, facilitated, and evaluated the institute. As the *Inquiry Institute* staff, the team planned the institute experiences and activities, established the physical spaces for the institute, met daily to reflect on the session, and supported each other as they engaged with inquiry around teaching and learning science. From this intensive two-week experience interacting with the consultants, the project staff and teacher leaders developed a level of expertise which enabled them to design additional science content sessions.

The tiered leader development model utilized an expert such as a consultant or scientist who designed and facilitated professional development sessions with the support of the project staff. Teachers on Special Assignment, teacher leaders, and classroom teachers participated in the sessions as learners, focused on a variety of goals. The consultant and Teachers on Special Assignment worked with the classroom teachers or students, as the teacher leaders observed through the lens of professional development design and facilitation. All participants involved benefited from the opportunity to engage in professional development centered on the teacher's questions about teaching and learning. The focus on students within the professional development was key to the work of the LSC and defined the most successful workshops and professional development.

Leadership development within the project was designed to sustain standards-based instruction in the project schools and ultimately within the district. Development of highly skilled professional development providers required a systematic approach clearly focused on developing pedagogy and content, refining facilitation skills, and building confidence. The LSC staff recognized the need to prepare a core group of leaders across the project and within each school who would support continuous professional development. The staff also recognized that the resources required to develop highly skilled professional developers were limited. The *Teacher Leader Institute*, mentoring process, collaboration with consultants and support from project staff were strategies utilized to develop leadership. Developing adequate numbers of teacher leaders to serve the needs of the project remained challenging. The transient teacher population impacted the development of teacher leaders. Time invested in preparing, mentoring and supporting teacher leaders did not directly benefit the project as teachers moved out of state, became administrators, or changed positions within the district. The staff was constantly faced with developing new teacher leaders to meet the professional development demand. Teacher leaders were prepared to lead particular workshop sessions, (i.e. initial use workshops, assessment, science content), enabling the staff to support teachers with implementation. In some cases, the teacher leaders were not as skilled with the initial use workshops as the project staff and this was evident in the session quality.

The MASE K-5 Using Technology project focused on providing initial use workshops for project schools and across the district, while at the same time supporting teachers in the project schools with insightful implementation of standards-based instruction. Leadership development at multiple levels was critical to the success of these two goals.

The project evolved through a dynamic process of design and evaluation of professional development based on the changing needs of the participants and within the district context. The project staff and administrators utilized the goals of the grant to assess progress annually and adjust professional development design. The key strategies to developing leadership within the project were the opportunity to work closely with consultants, scientists, and university faculty; the continuous mentoring by project staff; and the opportunity to accept responsibility for facilitating professional development with teachers. The *Leadership Institute*, *Inquiry Institute*, and follow-up sessions with consultants were valuable experiences in preparing teacher leaders to be successful through working closely with scientists and university faculty addressing mathematics and science

content. Continuous mentoring by project staff developed expertise in designing sessions and increasing confidence in facilitating professional development. These strategies evolved over the course of the project and ideally would have been strategically outlined from the beginning of the project allowing for more focused leadership development.

The eventual shift to site-based professional development with study groups, and insightful implementation through *Observing for Evidence of Learning* (OEL), would have been more effective had the core leadership been established at the school site first.

Focused leadership development within each school in year one of the project would have established a core group of leaders for collegial support during site-based initial use workshops, study groups, and OEL. As project staff worked in the schools relationships developed that were critical to building capacity and sustaining standards-based instruction. Teachers valued the TOSA as a resource while the TOSA instilled confidence in the teachers through their continuous interactions. Building these relationships early in the project would have established leadership at the school site and allowed project staff to develop the expertise of these leaders throughout the duration of the project. Beginning to build this leadership in the final years of the project was not soon enough.