

# A Mixed Method Study Explores the Impact of UCI-NSF PreK/K Leadership Training for Early Childhood Educators Integrating Science, Math, and Literacy

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**Research Context:** This study was conducted with participants in the *Science, Math, and Reading Schools (SMARTS)* year-long 48-hour PreK/K Leadership Institutes from 2003-07, a part of the UC Irvine *Faculty Outreach Collaborations Uniting Scientists, Students, and Schools- FOCUS!* NSF 5-year grant. Study participants included early childhood administrators, teachers, teacher assistants and bilingual teacher assistants with a wide range of education and ethnic experiences from 3 diverse UCI partnership districts. The primary goals of each PreK/K institute were to (1) Develop Teacher Leaders who model effective, research-supported practices for colleagues and parents; (2) Introduce and model research-based assessment and instructional practices that integrate science, math and literacy to improve learning for young children and English Learners at home and in school settings; and (3) Develop collaboration among PreK-K teacher leaders, parents, administrators, and university researchers to gain administrative support for implementation of the PreK-K model and continuation of successful, research-supported practices after NSF funding ends.

**Main Questions:** Three research questions were a focus of the study:

(1.) Did teacher confidence increase through their collaboration with other professional colleagues to plan and carry out more effective instruction of science, math, and literacy for all learners? (2.) How do PreK/K teachers plan collaboratively to organize and implement professional development opportunities for parents and colleagues? (3.) How do PreK/K teacher leaders describe their roles and goals as education leaders?

**Sample and Sources of Data:** Twenty-nine UC Irvine partnership district PreK/K NSF-funded Leadership Institute participants successfully completed the 2005-06 institute. All 29 submitted portfolios containing artifacts as evidence that they implemented assessment and instructional practices in the classroom and modeled purposeful literacy/math/science strategies in presentations to colleagues and parent. Data were collected and analyzed from 22 matched pairs on pre-post "Goal-Setting Confidence Survey" using Likert-scale 1 (not confident) to 4 (very confident) on 24 items in 4 categories: (1) Leadership; (2) Literacy; (3) Mathematics; and (4) Science. Seventeen participated in 20-to-30 minutes interviews. During the interview, participants were asked: "How would you define the concept of leadership as experienced during the PreK/K Leadership Institute?" One teacher responded, "*The institute opened a different view for me. We had a wrong concept of everyone following one person. It's wonderful that we were all accountable, learning, motivating. It's a different point of view not to be ashamed, embarrassed, afraid to model and continue our education.*"

**Main Results:** Statistically significant growth in pre (Summer, 2005)-post (Spring, 2006) confidence levels in each of the four survey categories: Leadership, Literacy, Math, Science  
Table 1. Mean differences between the two time points with paired sample *t*-test results for all participants

Scale	<i>n</i>	Mean Difference	Standard Deviation	SE of the Mean	95% Confidence Interval	<i>t</i> -value	<i>p</i> -value
Leadership	22	0.404	0.466	0.099	0.197-0.611	4.068	0.000
Literacy	22	0.436	0.794	0.169	0.084-0.789	2.577	0.018
Math	22	0.546	0.759	0.162	0.209-0.882	3.371	0.003
Science	21	0.391	0.789	0.172	0.032-0.749	2.269	0.034

Responses to interview questions and portfolio artifacts showed evidence of substantial growth. An experienced preschool director in a diverse and low-socio economic area responded to the question, “How would you describe your role as a literacy, science, and math instructional leader?” *“I have acquired knowledge and others ask me for it. I was a dry sponge and now I’m soaked with information. I’m a role model – not just babysitting. I am making a difference in their future life. I feel acknowledged and trusted for what I have to offer.”*

PreK/K teachers demonstrated that they became leaders who reflect upon their instruction to continually improve as they collaborate with parents and fellow educators to effectively guide young children to learn at school, at home, and in the community. Participants were asked, “Please share specific examples of how your teaching practice and professional experience have changed as a result of what you have learned during your participation in the Leadership Institute?” A teacher assistant shared, *“Before I would do things and I didn’t really know why I was doing them, so I think it gave me an insight to put things in order and to think about why I was doing it. To have a purpose, to know what you want out of that purpose and then work towards that. Before, I was just doing lesson plans and I was just doing random stuff that I didn’t really know why I was doing it, but just because it would take up time, so this gave me a guide.”*

**Implications:** This study demonstrates the powerful effects of equipping early childhood educators to take on a leadership role in their classrooms, schools, and communities. When asked to define the concept of leadership as experienced during the PreK/K Leadership Institute, a preschool teacher shared, *“You can’t lead someone to a place you’ve never been.... It’s very rewarding to me to feel myself as a leader and somebody who is being trusted with these young children and that people trust that what I have to offer is something that will actually benefit the children.”* Participants clearly demonstrated that they were motivated to raise the bar of expectations for their students, parents, colleagues and themselves.

**Future Possibilities:** A panel of five UCI math, science, and engineering graduate students from the *California Alliance for Minority Participation (CAMP) in Science, Engineering, and Mathematics Program* who overcame economic and other challenges to achieve their academic goals were invited to share their experiences. Many of them shared memories of first becoming interested in science and engineering when they were in preschool. These presentations and other experiences throughout the 2003-07 PreK/K Leadership Institutes inspired participants to see and express the future possibilities for the young children in their classrooms.

- ❖ Preparing early childhood educators to be leaders within their classrooms, in their schools, and in their communities has demonstrated a significant movement towards raising expectations for themselves and for the long-term success of their students.
- ❖ Future research is needed to explore the long-term impact on early childhood educators and their students when they become leaders in their school and community.

A preschool teacher leader enthusiastically responded during an interview when asked, “What experience in the leadership institute has had the greatest impact on influencing your goals...personally and/or professionally?”

*...“There is a feeling of life and pleasant noise in my classroom. Things are happening. The children are involved. .... I want to continue this feeling. ...Parents are new and do not have the language, but they can be educators to their children – they can talk about chemistry while changing oil in the car or as a mother is cooking.... We are capable, knowledgeable as a team to help them.”*