Session Title:
It Happened To Me: Perspectives from MSP Teacher Participants

MSP Project Name:
Minority Student Pipeline Math Science Partnership (MSP)[2]

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Project Session

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Summary:
How People Learn made the important observation that students get turned on to science between the fourth and sixth grades, and minority students are particularly vulnerable to early school influences (http://www.as.wvu.edu/~equity/african.html). Minority Student Pipeline-Math Science Partnership (MSP)[2] is a multifaceted partnership between a large-urban school district, a university system (which includes 4-year institutions), and a community college.   A major project focus is the impact of ongoing, high quality inquiry science professional development on middle school teaching and learning. This presentation centers on the experiences of MSP teacher participants and offers an opportunity for teachers to share specific examples of how MSP has affected their practice. More importantly, this panel of teachers will describe challenges and successes that MSP innovations have had on student achievement and interest in science.

Section 1: Questions framing the session:
This presentation focuses on MSP teacher participant perspectives on the following set of questions:
• What does it mean to teach science as, through, or with inquiry?
• Is on-going inquiry science an approach to science education that can be realized in the classroom or is it an idealized approach that is more theoretical than practical?
• Is inquiry science something that the "average" teacher can do, or is it only possible in the classrooms of the exceptional science teacher?

- How do students respond to classrooms that are built around inquiry science concepts?

Section 2: Conceptual framework:
As the MSP partnership has matured it has come to understand that inquiry science is a term that means something different to different people. This presentation explores some of these differences in understanding and the journey to common understandings. More importantly, the panel offers insights and observations into how inquiry science has been translated into actual practice at the individual participant level, the school level, and district level.

Section 3: Explanatory framework:
This panel represents science teachers, coaches, administrators and evaluators and their response to the following set of findings from the most recent survey of MSP teacher participants, N=60. The presentation will bridge the findings presented her with the voices and perspectives of actual teachers.
The majority (70%) of MSP participating teachers felt that there were specific steps that the school district could take to more effectively meet their science teaching professional development needs. In elaborating further on these needs, teachers most frequently mentioned support for hands-on science activities, inquiry-based instruction, differentiated instruction, lesson planning, updated science content knowledge, infusion of technology in the classroom, and pedagogical approaches to foster the development of higher-order and critical thinking skills among students.

Survey Item	Mean Response	% Agree or Strongly Agree
Before my participation in "Are you IN-quiry?" I was confident in my ability to effectively teach science.	2.82	69%
Before my "Are you IN-quiry?" experience I enjoyed teaching others about science.	3.25	87%
After my participation in "Are you IN-quiry?" I enjoy teaching others about science more than I did before my participation.	3.46	87%
After my participation in "Are you IN-quiry?" I enjoy learning about science more than I did before my participation.	3.52	89%
After my participation in "Are you IN-quiry?" I am more confident in my ability to effectively teach science.	3.64	100%

Survey Item Scale: 1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree

Teachers were asked a series of questions about their professional communication and collaboration with other teachers and colleagues in the district regarding teaching and learning related topics:

Survey Item	Mean Response	% Agree or Strongly Agree
During my participation in "Are you IN-quiry?" I have found opportunities to communicate with other teachers and professionals useful to my teaching.	3.51	100%
After my participation in "Are you IN-quiry?" I will likely continue to communicate with teachers from schools other than my own.	3.44	98%
I would like more district led opportunities to work with teachers from other schools.	3.47	98%

Survey Item Scale: 1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree

When asked how frequently they communicated with teachers outside of their school about academic concepts prior to their "Are you IN-quiry?" (MSP)[2] professional development experience, only 5 of the 55 teachers (9%) who responded to this survey question indicated "often." In comparison, when asked how frequently they now communicated with teachers outside of their school about academic concepts (i.e., since participating in "Are you IN-quiry?"), 21 of the 55 teachers (38%) who responded to this survey question indicated "often."

When asked about the person(s) outside of their current school to whom they would most likely turn for specific science education related questions, teachers most frequently cited one of the (MSP)[2] science coaches in the school district, other instructional staff in the district's Science Office, (MSP)[2] faculty and graduate students from partner universities, and fellow district science teachers from professional development programs such as MSP summer science institute.

Professional Development Impact and Implementation

When asked whether they had been able to adapt the various strategies they had learned in their "Are you IN-quiry?" professional development sessions to their classroom setting, 2% of the responding teachers strongly disagreed, 2% disagreed, 45% agreed, and 51% strongly agreed. When asked whether they had shared these strategies with other teachers or administrators, 2% of the responding teachers strongly disagreed, 2% disagreed, 61% agreed, and 35% strongly agreed. When asked about the biggest

impediment to using "Are you IN-quiry?" techniques in the classroom, participants most frequently cited the lack of time.

Student Engagement and Achievement

Teacher participants were asked about the extent to which they perceived that the application of "Are you IN-quiry?" teaching techniques was having a noticeable impact on student engagement and achievement in their classes:

Survey Item	Mean Response	% Agree or Strongly Agree
I have less classroom management issues when I use "Are you IN-quiry?" techniques when compared with traditional lecturing.	3.20	90%
My students score better on classroom assessments when I use "Are you IN-quiry?" techniques when compared with traditional lecturing.	3.33	96%
My students are more engaged in science class when I use "Are you IN-quiry?" techniques when compared with traditional lecturing.	3.37	96%

Survey Item Scale: 1=strongly disagree; 2=disagree; 3=agree; 4=strongly agree

Section 4: Discussion:
This session could potentially be very powerful and valuable to NSF-MSP projects because it illustrates the frustrations and best practices for implementing inquiry science teaching on a wide-scale basis. Furthermore, the panel presenting here shares their insights into the types of supports that are necessary to maintain reforms to teaching and learning through inquiry science. Investigators have set about establishing the conditions under which a form of inquiry teaching would emerge.

Section 5: How will you structure this session? What is your plan for participant interaction?
Given the limitations on time, the presentation be strategically designed to give session attendees opportunities to interact with a variety of teacher voices. The panel will rotate among small working/discussion groups during the session. The areas of focus for the presentation include (1) introduction of panel and overview of project design; (2) inquiry science professional development series description and analysis of outcome data; (3) teacher voice and responding to teacher participant needs; (4) discussion of implementations to other MSP projects.