

*A Community-based Approach to
Engaging Students and Teachers
in Effective STEM Education*

Teacher Professional Development to support STEM Equity

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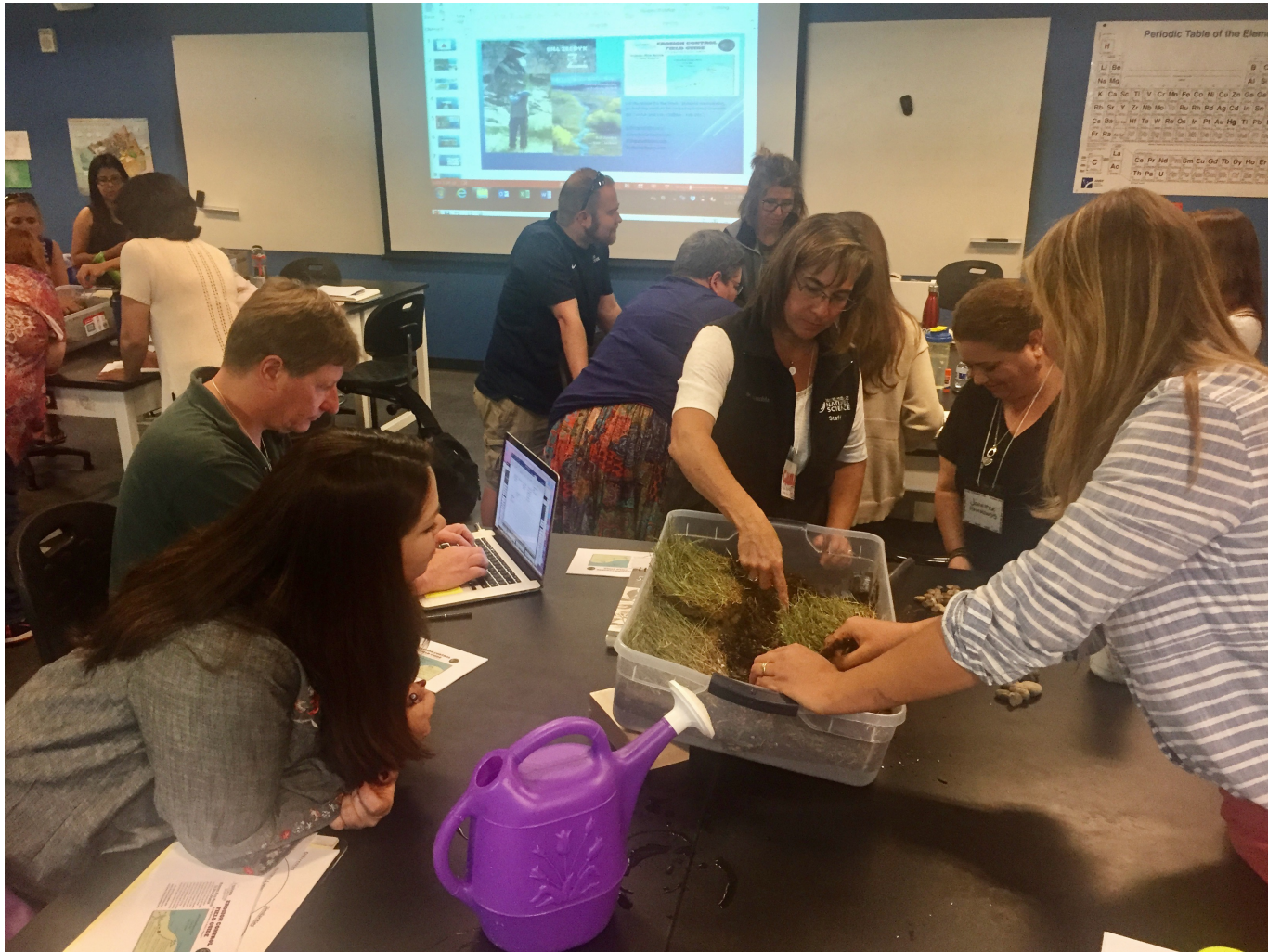


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What is Multi STEM?



Structure & Logistics

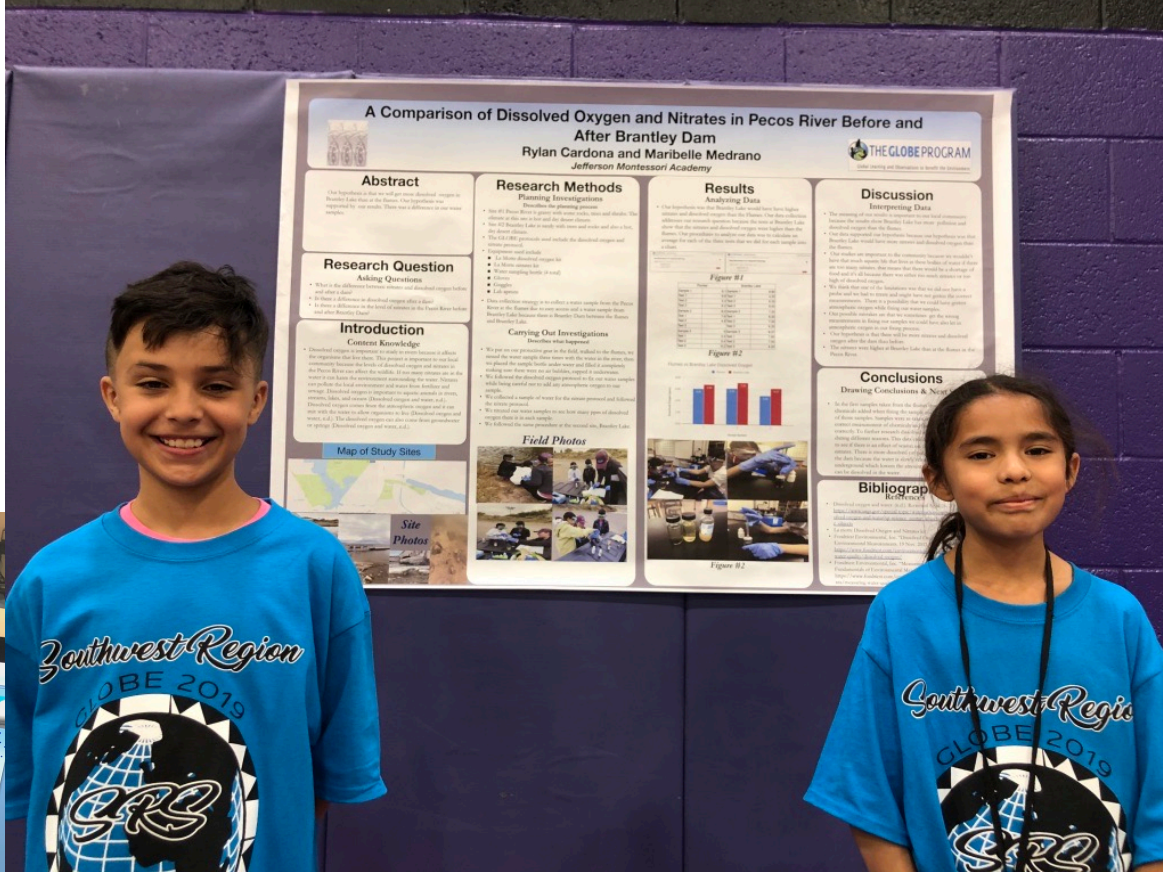


Educators: Focal Students as a Tool for Reflection



IEP
special low achievers
English students at-risk
slow color needs poor tracking
Learners threat high stereotypes
expectations
stereotype

Findings: Teachers' use of Focal Students



Professional Developers: Serve as Participant Observers



Many teachers see expertise as something held by others, and much of the transmissive professional development they experience reinforces that notion. Multi aims to be a more transformative community where we recognize each person's funds of knowledge and learn from each other. As you are probably aware, many teachers do not often feel valued for their work and have varying levels of self-efficacy themselves.

The workshops are designed to help teachers increase their content knowledge and develop pedagogy that is inclusive of learners who have been less confident or engaged in science. Embedded in Multi are many inclusive STEM pedagogies--engaging in locally relevant problem-based learning, recognizing and drawing on funds of knowledge, making broad career pathways explicit, highlighting math practices embedded in the work, doing hands-on STEM that is meaningful, developing a safe space for learning that includes failure, extensive formative assessment, technology that facilitates learning, engineering potential solutions to problems, relevant current events, and all the 21st century/essential skills: collaboration, communication/academic language development, innovation, and critical thinking.

At the beginning of each session we will ask teachers to think of some focal students who have struggled in science. At the end of each session we will ask teachers to focus on those students specifically as they customize their padlet for their own teaching. If they plan their instruction with those students in mind, their lessons will be more inclusive of the needs of all students.

Please engage with the teachers during all the sessions. Wear dual hats of coach and observer--try to collect data on how they are responding to the sessions and workshops, what seems helpful, and what they are struggling with. Ask them questions. Learn from them. Try to help them develop greater confidence in doing this work in their own settings. The idea is that your observations will help us with refining our Multi work, and it will also help you think about the ways you plan and offer your own professional development.

After the participant sessions ends, the team will meet to debrief. Share your observations and ideas. Document your own takeaways and how you will incorporate those in the professional development you offer. It can even be lessons learned from something that did **NOT** go well--how you structure your groups, for example, or how to have more equitable engagement by the teachers in hands-on work. All of your notes and observations are meant to be helpful for your own use, and at the same time they serve as data for us.

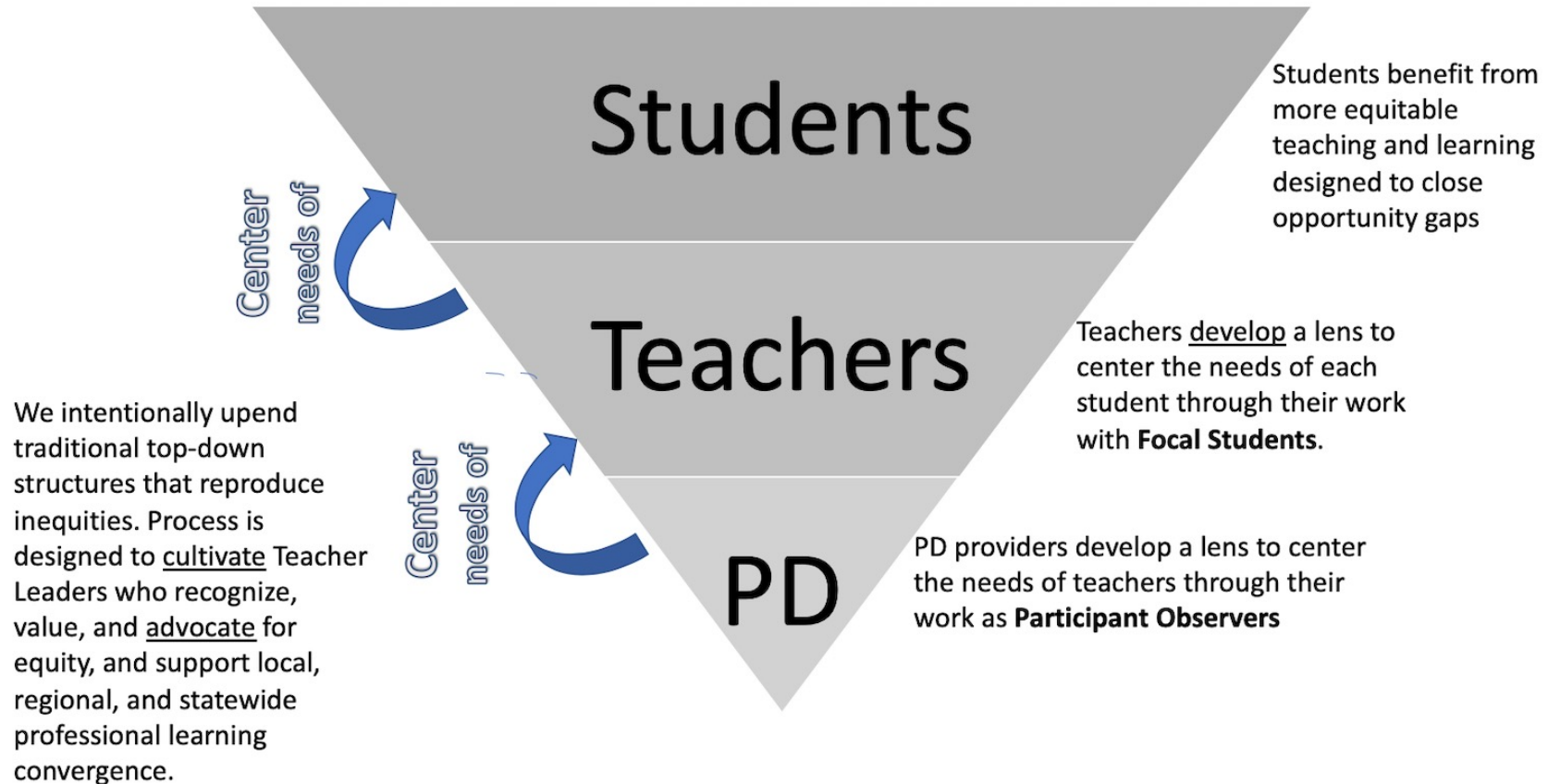
When you are back in your own setting, please document the professional development you offer. How did you incorporate your takeaways from Multi? What was the nature of the professional development? How many teachers did you work with? Are they preservice, inservice, or both? What grades are they teaching? We then want you to learn from the teachers. What are THEY able to implement? What outcomes are they seeing with their own focal students? (Teachers who report back, either through padlet, google forms, interview or webinar receive a stipend.) This is not mere data collection. When we ask teachers to share the ways they are implementing the work, we are recognizing their professional knowledge. It repositions teachers as knowledgeable experts, an important shift both for themselves and in the public sphere.

Findings: Leading PD as Participant Observers



Logic Model

Multi STEM Logic Model





Thank you!

What questions or comments do you have?

Participant Observer instructions

Participant Observer Planning and Reflection
tool...we would LOVE your feedback!

Padlets

(links to some padlets on following slide)

Project Overview <https://padlet.com/jjaz2co/8ogqid0gn83v>

STEM Equity <https://padlet.com/jjaz2co/5h8dovlx0j2j>

GLOBE Resources <https://padlet.com/usglobecc/u2hct62nz5o8>

Water Quality and Human Health <https://padlet.com/jjaz2co/vtxhjxhbuih9>

Weather, Climate, and Human Health <https://padlet.com/jjaz2co/qt94bvad87xf>

Air Quality and Human Health <https://padlet.com/jjaz2co/4cmg2713590w>

Fire and Human Health <https://padlet.com/jjaz2co/5svroqf8hu1n>

Inquiry, Problem Based Learning, and Backward Design <https://padlet.com/jjaz2co/ic59qzyb6y44>

MULTI, GLOBE & EcoSchools <https://padlet.com/jjaz2co/snt6c855gkol>

STEM Career Pathways <https://padlet.com/jjaz2co/eid2u1vs9y8g>

General Classroom Resources <https://padlet.com/jjaz2co/c2yqhd4jyccf>

Classroom Implementation-Data Collection <https://padlet.com/jjaz2co/9yaeyza1ulzz>