



Designing and Engaging in Effective Professional Learning Experiences

William R. Penuel
University of Colorado Boulder

What was the most effective professional learning experience of your career?

- + Who was there?
- + Where did it take place?
- + What was the focus?
- + When did it take place?
- + Why was it effective, in your view?



What do I mean by “professional learning experience”?

Any experience that helped you develop knowledge or skill that helped you become a better teacher of students or colleague



What were some answers to the “why” question in your group?



Being an Active Learner

- + Asking questions
- + Helping others
- + Making oneself vulnerable
- + Trying on new roles and partly succeeding

Being an advocate for yourself as a learner

- + Asking for evidence base behind strategies
- + Telling leaders about your interests and needs
- + Making connections to local priorities that others need to make
- + Providing clear and constructive feedback to leaders



A Recent Personal Experience...

I learned how to give a TED talk....

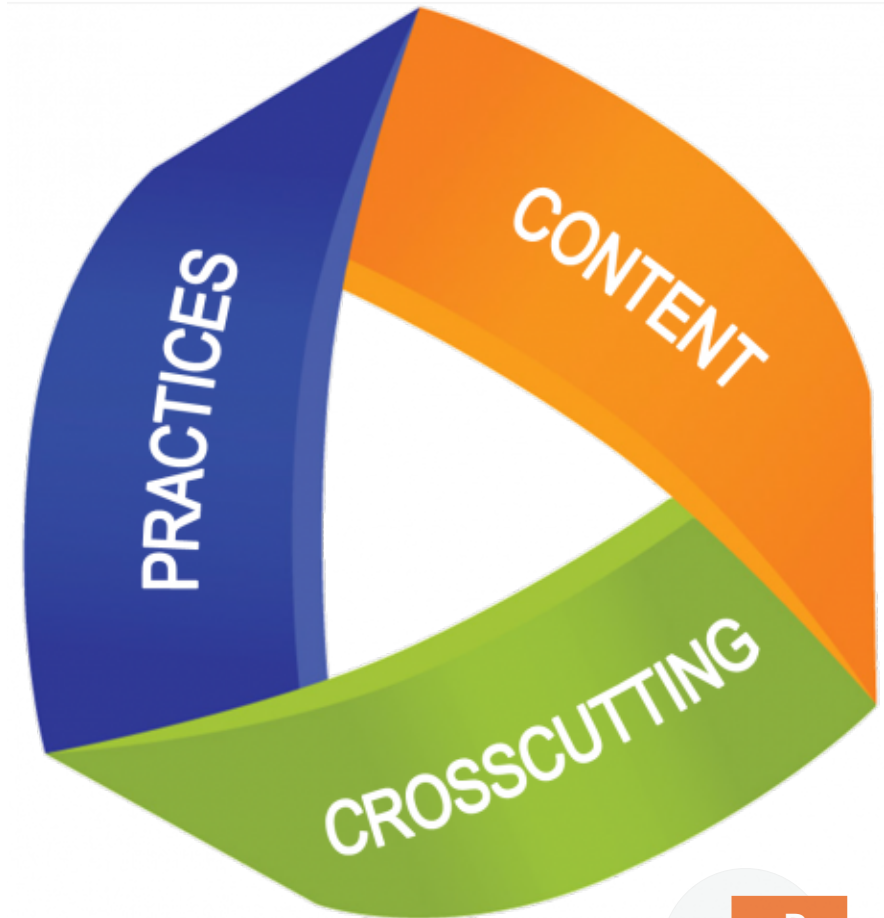
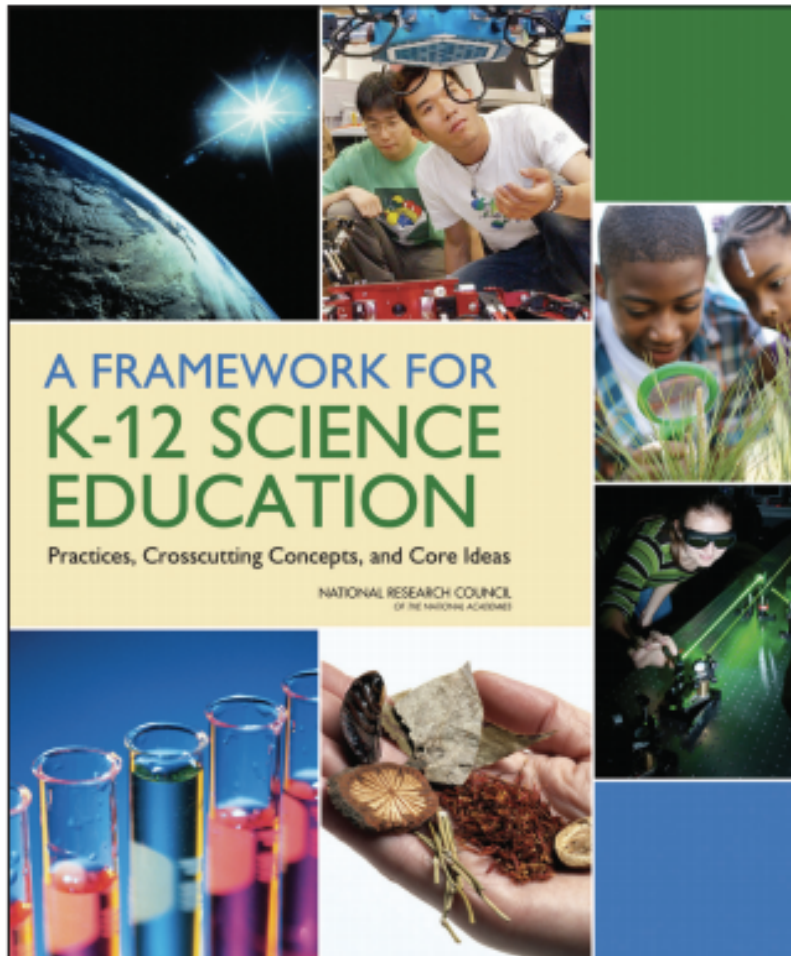
These are different from how university researchers usually speak.

The focus on physical aspects of speaking was challenging for me and for my colleagues.

I got better over time, but it also helped me with my teaching.



Three Dimensional Science Teaching and Learning



Principles of the Framework

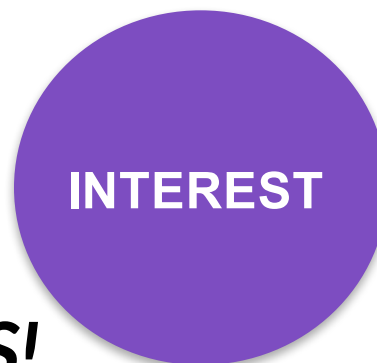
- + Children are born investigators.
- + Focusing on core ideas and practices.
- + Understanding develops over time.
- + Science and engineering require both knowledge and practice.
- + Connecting to students' interests and experiences.
- + Promoting equity.



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- + **Connecting to students' interests and experiences.**
- + **Promoting equity.**

***TWO MORE
DIMENSIONS!***



It's déjà vu all over again.



- We understand that major shifts in teaching require professional development for teachers, instructional coaches, and school and district leaders.
- We understand that teacher preparation programs will need to strengthen and align their focus on a new vision for student learning.

You can't step into the same river twice.



- The shifts teachers are being asked to make are from inquiry to 3D science learning.
- The landscape of teacher preparation, induction, and retention is different.
- Large public investments in new science curriculum and assessments are unlikely in the near future.
- Our student population is becoming ever more diverse.

Three Big Shifts We Have Observed as Challenging for Teachers to Make

Assessing students by asking them to recall facts

Assessing students using 3D tasks, rubrics

Asking some students known-answer questions

Engaging all students in argument from evidence

Confirmatory labs that show an already-taught idea

Building understanding of DCIs, CCCs through labs



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Anchoring teaching in phenomena

At your table:

Which shift is the biggest challenge to you?

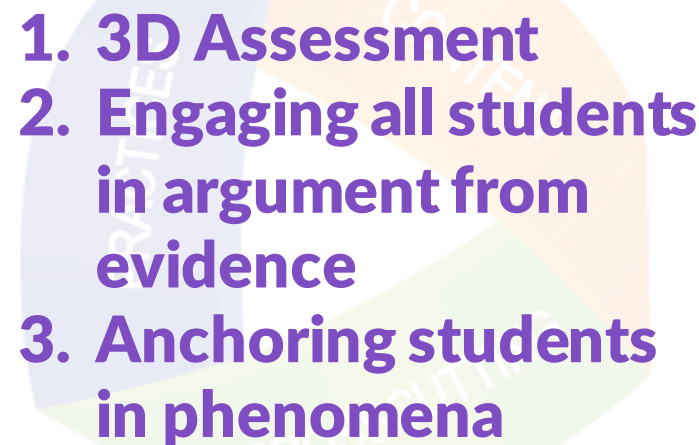
Which shift could you help others make?



Design Challenge

Design an agenda for 2-hour introduction for a teacher team at your grade level band (ES, MS, HS) to address one of the challenges we have identified together.

Suggestion: *Form a group with others from your grade band for a shift that you can help others make (even if just a little bit).*

- 
1. 3D Assessment
 2. Engaging all students in argument from evidence
 3. Anchoring students in phenomena



What are your initial ideas...

- + About some of the challenges colleagues who you know and who are interested in learning more about 3D science teaching and learning will face with respect to this shift
- + About some activities you could help lead to support those colleagues' learning



To Help You Design....

Science Professional Learning Standards

An effort to synthesize best available research on how to organize science professional learning experiences

A set of principles to use to guide the design, implementation, and evaluation of professional learning opportunities, wherever they might occur



To Help You Design....

A6. Model instructional strategies and curriculum materials that are consistent with the desired shifts in teaching and learning introduced in professional development.

A7. Accommodate participants' varied levels of experience in supporting three-dimensional science teaching and learning.

A8. Connect ideas and instructional strategies introduced during the professional development experiences to educators' current beliefs, instructional strategies, and goals for learning.



To Help You Design....

For the assessment challenge: A1. Support educators to develop strategies for eliciting, interpreting, and making use of students' reasoning to inform their science instruction.

For the argumentation challenge: A5. Integrate strategies that promote equitable participation in science learning for all learners.

For the anchoring in phenomena challenge: A4. Prepare educators to connect science learning with students' interests and experiences.



To Help You Design....

Learning performances that blend an principle of the *Framework* with some aspect of work that teachers do every day are a good way to state the goals of the experience.



Let's Hear About Some Plans....

What are the teacher learning performances?

How will you model the instructional strategies that you are promoting?

How will you address the fact that teachers in the group will have varied levels of experience in supporting students 3D science learning?

How will you connect the activities to teachers' prior experiences?



Let's Hear About Your Process...

What challenges did your team face in designing an agenda?

What resources would you need or want to look for, to provide participants in the experience?

What resources and expertise did you discover in your design group?



Resources to Help Plan Professional Learning Experiences

Science Professional Learning Standards

<http://www.csss-science.org/downloads/SPLS.pdf>

Three-Dimensional Classroom Assessments

<http://stemteachingtools.org/news/2016/short-course-how-to-develop-3d-formative-assessments-for-the-science-classroom>

Adapting Curriculum Materials to Focus on Phenomena

<http://stemteachingtools.org/news/2016/curriculum-adaptation>



THANK YOU!



researchandpractice.org
@RPCollaboratory

Bill Penuel
william.penuel@colorado.edu
@bpenuel, @learnDBIR