No Floor, No Ceiling: Pathways to a Pedagogy for Our Time

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Abstract:
The new national science and engineering standards require a transformation of educational practice in ways that should increase student interest in these fields – changes also supported by the Common Core standards. These standards support a profound change in pedagogical practice that may be challenging for some educators. This workshop is designed to provide concrete support that makes transforming teaching and learning easier in the classroom.

The workshop explores the reasons for the new standards, and shows examples of tools that can help teachers of almost any grade embrace the spirit of them in their work with students. We are shifting from a noun-based curriculum to one based on verbs (design, invent, create, explore, etc.). Inquiry-driven project-based learning is a perfect practice in this setting, and examples related to space science and engineering will be explored in this session along with examples from subjects ranging from the arts to history. Through a series of discussions and hands-on activities, participants will develop a deeper understanding of the expectations of the new standards, as well as explore and implement strategies to shift the dominant pedagogical model to one that celebrates transdisciplinarity and a deeper understanding of the ways practitioners in the various academic fields practice their craft.

Outline for the two-day workshop:

- Why NCLB was a failure – the need to move from ceilings that limit growth to floors that allow infinite growth of student skills and interests in a field.
- The new standards – Common Core, NGSS (Next Generation Science Standards) – new expectations for a new time.
- Why the NGSS have three parts to them.
  - How practitioners do their work in science and engineering
  - Disciplinary core ideas, and,
  - Transferability
- What makes engineering different from science.
- Making the shift from nouns to verbs.

- The importance of connections to multiple subject areas.
- From data to understanding – where technology helps.
- Why inquiry-driven PBL is essential in today's classrooms.
- When and how to stop sharing information and turning control over to the learners.
- The increasingly important role of questions – and what makes a good driving question.
- The difference between projects and activities – and why each has a place in any subject area.
- Project Cycle: driving question, research, project, sharing, evaluation – repeat with new questions.
- Driving Questions: working through a challenge – introducing the Knights of Knowledge materials.
- Research: how to find good data.
- Evaluation: the role of rubrics.
- Epistemic frames: moving from teaching about a subject to immersion in the subject itself.
- How to create driving questions of your own.
- Practice in coming up with your own questions.
- How to create an inquiry-driven project.
- Project creation and sharing: make a project and share it with colleagues.

Audience: All
Grades: 3-12, and beneficial to teacher education as well
Topic: Implementing the new standards
Duration: Keynote speech to multi-day workshop. Materials: Each participant will receive a complete curriculum set with background papers and teacher tips for fifty projects. The accompanying DVD-ROM includes fifty high resolution videos suitable for use with K-12 students.
Requirements: For the workshop, teachers need their own laptops with software installed from our list. They will also need Internet access. All other curricular material is included (we need an exact headcount for this). Presenter needs Internet access and projection system with audio for the presenter's computer.