Program

Evidence-based teaching – just the facts or thinking like scientists?
16th-19th September 2013, Gułtowy

Experts' profiles

Diane Ebert-May, PhD
University Distinguished Professor
Department of Plant Biology
Michigan State University

Diane Ebert-May provides international leadership for discipline-based biology education research that integrates life sciences and cognitive science. She promotes professional development, assessment and improvement of faculty, postdoctoral scholars, and graduate students who actively participate in creative research about teaching and learning in the context of their scientific discipline. Ebert-May's research group developed and tested a model for professional development workshops based on learner-centered teaching. They continue to investigate the impact of undergraduates' design and use of models to build conceptual connections across scales in biology and are following students' progress through a sequence of the major's biology curriculum. Ebert-May leads FIRST IV, an NSF-funded professional development program to help postdoctoral scholars create and teach their first introductory biology course in preparation for their future academic positions. Her book, Pathways to Scientific Teaching (Ebert-May and Hodder eds), is based on active learning, inquiry-based instructional strategies, assessment and research. She teaches plant biology, introductory biology to majors in a large enrollment course, and a graduate /postdoctoral seminar on scientific teaching. Ebert-May is a Fellow of the American Association for the Advance of Science(AAAS)Fellow and was recently awarded the Carnegie Foundation & CASE–US Professor of the Year, MI 2011, and received the AIBS Education Award in 2012. Her plant ecology research continues on Niwot Ridge, Colorado, where she has conducted long-term ecological research on alpine tundra plant communities since 1971. Education: BS University of Wisconsin (Botany), MA and PhD University of Colorado (Ecology and Evolutionary Biology).

Jarosław Bryk, PhD
National Centre for Biotechnology Education
University of Reading

Jarosław Bryk is a molecular biologist currently working at the National Centre for Biotechnology Education University of Reading on developing experimental resources for teaching undergraduate synthetic biology that employ principles and assessment approach of scientific teaching.

	Pre-Workshop	
When?	**Objectives**	**Activity**
How have your experiences as a student -and teacher impacted how you teach?	Participants reflect on their experiences as a student and teacher to: • Identify learner-centered teaching • Define the role of the teacher and student in the classroom "Faculty" in this agenda includes "faculty, postdocs, graduate students"	Complete and bring to the workshop ○ ATI – Approaches to Teaching Inventory ○ TGI - Teaching Goals Inventory ○ Read PDF – How People Learn

	Day 1 AM *Introductions & How People Learn*	
When?	**Objectives**	**Activity**
9:00-12:30	Welcome • Introductions • Establishing a learner centered community • Personal Goals- Instructional Goals	• Engagement: folders (in Pathways – Chapter 1); who we all are and how we got here • Goals, Hopes and Challenges – post/synthesize/share
	Setting Goals and Orientation	• Expectations, outcomes, communication.
	Understanding learning theory- How do people learn? • Establish a starting point for faculty • Establish a theoretical foundation and framework	• Video- "Lessons from Thin Air" – • Theoretical basis for learning (constructivism, prior knowledge, learning progressions} • Chapter 1 – How People Learn - Jigsaw
12:30-1:30	LUNCH	
	Day 1 PM *Effective Classroom Pedagogy for Learner-Centered Teaching*	
	Objectives	**Activity**
1:30-5:00	• Reflect on your own teaching practice or experiences as students • Critically evaluate teaching examples • Develop skills in self-evaluation of teaching practice	• Inquiry-based Teaching Self-Assessment - where are you on continuum and why? • What does a learner-centered classroom look like? What does an instructor-centered classroom look like? • Group – view and assess videos of teaching • Develop criteria • Individuals reflect on their own teaching in pairs • Teaching experiences

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	Day 2 AM- Scientific Teaching *Course Framework and Instructional Design*	
When?	**Objectives**	**Activity**
9:00-12:30	• Faculty identify the course they will develop or reform • Faculty reflect on what they want their students to learn and recognize the variety of types of goals • Introduce Bloom's taxonomy and the concept of higher- and lower-order thinking • Introduction to learning goals and objectives • Faculty determine desirable levels of student thinking and learning	• Determine key courses to be developed or reformed • Form 'course groups' • Engagement Activity: Teaching Goals Inventory (TGI)- process • Developing goals – link with TGI and Blooms Taxonomy - what should guide? (course definition, program/departmental goals, PCK (Pedagogical Content Knowledge). Broad course goals, then key concepts/topics with objectives. • Faculty ID key concepts/topic. • Use Bloom's Taxonomy to articulate assessable learning goals and objectives.
12:30-1:30	LUNCH	
	Day 2 PM *Assessment - Driving Instruction with Data*	
	Objectives	**Activity**
1:30-5:00	• Introduce Backward Design • Explore assessment strategies	Give and gather feedback about teaching and learning • Why assess? What to assess? How to assess? • Introduce different types of assessment and concept of formative and summative assessment.
	• Practice assessment	Course Framework –revisit • Designing aligned assessments. HOMEWORK - Jigsaw exercise with Scientific Teaching Chpts 1-4.

	Day 3 AM- Scientific Teaching *Applying Principles and Adapting Instructional Design*	
When?	**Objectives**	**Activity**
9:00-12:30	• Apply theory and principles to practice • Group reflection	• Jigsaw of Scientific Teaching • Further development of assessment questions. • Feedback - peer review
	What do student-centered and teacher-centered classes look like?	• Venn diagrams: student-centered and teacher-centered. • Different types of active, student-centered practices
12:30-1:30	**LUNCH**	
	Day 3 PM *Designing Your Course Framework*	
1:30-5:00	Teaching Practices	• Completing the Course Framework Alignment Table (CFAT) for two objectives – one Lower-cognitive level and one Higher-cognitive level • Report, reflect on challenges of aligned lesson plan – whole group.

	Scale up – microteaching to unit or course
	
	Develop their course framework
	Provide feedback about their needs
		• Applying backward design entire course.
		    o *Who are your students?*
		    o *Who are your partners for course development?*
		    o *Other resources?*
		
		• What does a finished course look like?

		Day 4 AM *More on Group Work and Grading*
When?	**Objectives**	**Activity**
9:00 – 12:30	• Use cooperative and collaborative approaches to learning	• Establishing the value of group learning - videos • (Effective Group Work in College Science Classrooms Part 1 (http://www.youtube.com/watch?v=TzMei8KDkGI and Part 2 http://www.youtube.com/watch?v=rUSN8vHRB-A). • Assessment of groups
	• Examine types and uses of rubrics to align criteria and levels of achievement with learning objectives	• Analyze rubrics • Make rubrics
	• Shift focus back to you and your course: Draft assessments that are aligned with course/unit learning objectives.	• Faculty continue working on their course using CFAT
	• Individual and Large group reflection	• Reflection paper
12:30-1:30	**LUNCH**	
	Day 4 PM *Work on Course and One Lesson*	
1:30-5:00	• Faculty exchange what they have developed so far for their course and lesson • Groups evaluate	• Faculty continue to work on one lesson from the course • Lessons by Groups • Action plans for individuals, groups • Workshop Evaluation