Detailed Syllabus--Mechanics Virtual Community of Practice (VCP)

VCP Time: Thursday 1.30-3 pm (Eastern time), April 4-May 16 (seven sessions in all)

VCP Location:

- weekly meetings using Adobe Connect at http://asee.adobeconnect.com/mechanics
- between-meeting communication using OpenAtrium at http://aseevcp.asee.org/?q=mechanicsvcp

VCP Leaders:

Edward Berger
University of Virginia
berger@virginia.edu
434-924-6326
@UVaSEASAD

Brian Self
California Polytechnic State University
bself@calpoly.edu
805-756-7993

VCP Objectives

At the end of this experience, participants will be able to:

- *Articulate* the key features of learning taxonomies and *describe* specific approaches/tools/strategies that target activities at different levels of the taxonomies
- *Identify* their students' motivations and *deploy* research-based teaching strategies that successfully tap into those motivations
- *Align* course objectives, assessments, and instructional strategies to promote learning
- *Integrate* specific research-based, active learning strategies into their own classes
- *Create* new learning activities for their students that use techniques known to promote learning
- *Cultivate* a welcoming classroom environment, an awareness of student learning differences, and a respect for student intellectual/social/emotional development
- *Understand* the expectations of funding agencies and education journals for quality, depth, and breadth of educational research proposals and papers

Technical Issues

VCP Meetings. This Mechanics Virtual Community of Practice is, by definition, a virtual organization that relies upon web conferencing software to facilitate its meetings. As such, your technology set-up should be reliable, have sufficient bandwidth, and have suitable hardware and software. We recommend:

- use a hard-wired connection, rather than wireless, if possible
- use a USB headset rather than your computer's built-in speakers and microphone
- test your set-up with us before the first session on April 4--test sessions will happen at the following times (all *Eastern* time):
    - o Wednesday April 3, 11-12 pm (Brian will be present)
    - o Thursday April 4, 11.30-1.30 pm (Ed will be present)
- You should plan to log on to the VCP meeting room via AdobeConnect at one of those times to test your technology set-up, audio settings, etc., so that our first full VCP meeting on April 4 is smooth and without technology glitches. This should take no more than 10-15 minutes of your time. Either Ed or Brian will be in the meeting room at each of those times to coach you in case any technology issues arise.

VCP Communications. In between meetings, notes, slides, and readings will be posted on the OpenAtrium portal, of which all participants are registered users. The VCP leaders will also communicate via email with reminders and preparatory materials for each week's session.

VCP Meeting Organization and Expectations

Each VCP session (90 minutes total) is broken down into blocks of specific activities that support the learning of that session's objectives. In general, each VCP session will be broken into a sequence of activities falling into three broad categories: (i) housekeeping, (ii) "lecture" (i.e., conveyance of information), and (iii) active learning. The mixture of these activities will vary from week to week, depending upon that week's content.

- The "lecture" activities will use Powerpoint type slides with the opportunity for participants to use the back-channel chat functions in AdobeConnect to ask questions and otherwise participate.
- The active learning activities will use the breakout rooms, polling function, Q&A, and other tools of the AdobeConnect software. Again, the mixture of activities will be chosen each week to best target the learning objectives for that week's session.

The mix of "lecture" type activities and "active" learning activities is intentionally used to model an appropriate and hopefully useful mix of strategies for teaching and learning. As such, active VCP participation is critical for all participants.

The *expectations of participants* are as follows; all participants (including the leaders!) will:

- *attend* each VCP session and actively contribute to the discussion
- *read and reflect* on all assigned material
- *set aside* the chaos of daily faculty life and *present* our best selves to the group
- *interact* via the OpenAtrium portal in between VCP sessions as requested by the leaders
- *engage* the material and the group with *energy* and *curiosity*, *respect* for each other and our ideas, and *patience* in the face of the possible (inevitable?) technology hurdles

Recommended Reading

- *How Learning Works*, by Ambrose, Bridges, DiPietro, Lovett, and Norman, Jossey-Bass: San Francisco, 2010. IBSN: 978-0-470-48410-4 (Amazon: < $30)
- *What the Best College Teachers Do*, Ken Bain, Harvard University Press: Cambridge, 2004. ISBN: 0-674-01325-5 (Amaon: < $20)

These books are indeed *optional*, although they are excellent sources of ideas and present very readable syntheses of the relevant research. We will be leaning particularly on the *How Learning Works* (HLW) framework as an organizing principle for the VCP, and we will introduce the key concepts as we go along. You do NOT need to purchase this book to participate in the VCP, but it is a useful resource to have on your bookshelf now and in the future.

In addition to the HLW framework, we will be citing and discussing a variety of articles from scholarly journals and the web, and these articles will be made available on the OpenAtrium portal or via links to downloads.

Detailed List of VCP Meetings and Topics

Se*ssion 0 (before the first VCP meeting on April 4).* Before our first meeting as a group:

- Log on to OpenAtrium with the login information sent to you and update your user profile with current information and a picture
- Join one of the scheduled technology test sessions (April 3 or 4; see above under **Technical Issues**) to ensure that your technology set-up is suitable for use with AdobeConnect
- Explore the OpenAtrium site to learn its features, and feel free to download and read the background and support documents about AdobeConnect
- **complete the Mechanics VCP background knowledge survey by 5 pm on April 3** (http://www.surveymonkey.com/s/7JK7LJW). Note that this survey is *different* from the "general" VCP survey you have already completed, so please fill out this Mechanics-specific survey before April 3 at 5 pm Eastern time.

The VCP session each week will be designed to reflect the interests of participants, especially as indicated in the Mechanics VCP background survey. The general topics and schedule listed below is our current best guess about how the sessions will unfold. However, based upon the results of the Mechanics VCP background survey, it is likely that this basic schedule will be revised.

Session 1: Student Motivation and a Positive Classroom Climate. In this session, we will explore student motivation and tools to create a positive classroom environment, highlighting the *How Learning Works* framework. We seek to understand how students' learning goals may or may not match instructors' learning goals for students. We will also use the VCP sessions as a model for how to create a positive classroom climate.

Session 2: Learning Taxonomies (April 11, 2013). In this session, we will begin to explore the core concept of a learning taxonomy. The learning taxonomy specifically considers both the "knowledge" dimension and the "cognitive" dimension and provides an excellent framework in which to understand course objectives and activities.

Session 3: Aligning Course Objectives, Assessments, and Instructional Strategies (April 18, 2013). In this session, we consider methods for writing good course objectives, methods to assessment achievement of those objectives, and how to align instruction strategies with those objectives and assessment.

Session 4: Active Learning Strategies, Part I (April 25, 2013). In this session, we will explore a sampling of the most common, research-based active learning strategies proven to support student learning. We will cover think-pair-share, "team" homework, and other easy-to-use active learning techniques.

Session 5: Active Learning Strategies, Part II (May 2, 2013). In this session, we continue our exploration of active learning strategies, including activities that target higher-order features of the knowledge and cognitive domains. We will cover clickers, peer instruction, and problem-based learning.

Session 6: Teamwork and Group Learning (May 9, 2013). In this session, we examine the use of group projects, team-based learning strategies, and best practices for team formation and guidance.

Session 7: Flipping the Classroom; Toward Engineering Education Research (May 16, 2013). In the first half of this session, we illustrate how a flipped classroom can be structured to create more time for active learning during face-to-face class meetings. This VCP session will itself be "flipped", and participants will need to watch the video and review the background material before joining the session. There will be a quiz at the beginning of the session! In the second half of the session, we provide a brief overview of how engineering education research is proposed, funded, and executed.

Session 7+: Post-Experience Communication (On-Going). The goal is to create and sustain a thriving community of practice in which participants actively share ideas, successes, failures, aspirations, strategies, and the camaraderie of their peers. To that end, we have several planned activities:

- Monthly email updates: the leaders will occasionally post new materials to the OpenAtrium portal for your consideration, including reading materials, polls, and discussion questions.
- ASEE MVCP happy hour: for any participants who plan to attend the ASEE 2013 meeting in June in Atlanta, we will organize a group meeting/happy hour for in-person networking and to further solidify the identity of this community of practice