

Teaching ASPEN Plus via Student Developed Video Modules

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Tuesday 11/12 - Session 263a

Date

UConn

The Problem...

Student engagement with and use of modern chemical engineering computing tools is limited...

*Course Placement -
Student Proficiency*

Faculty Time

Faculty Proficiency

The (A?) Solution...

*Course Placement -
Student Proficiency*



*Video Modules
Across Curriculum*

Faculty Time



*Hybrid/Flipped
Outside of Class*

Faculty Proficiency



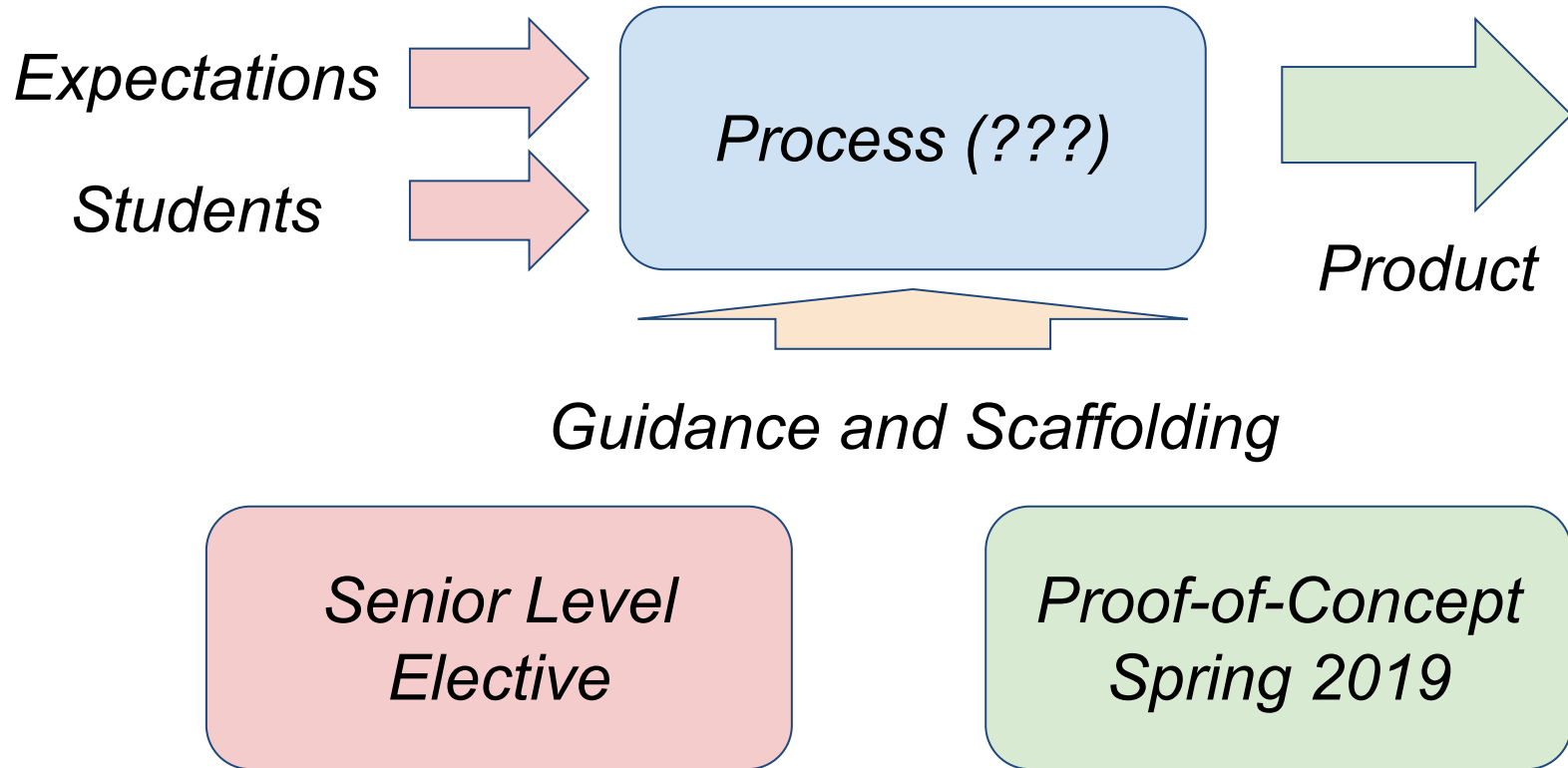
*Collaboratively
Developed*

Why Student Developed?



- Professional development for students...
- Provides a diversity of presenters...
- *Student-driven: doesn't require faculty in each course to develop expertise!*

Students Need Guidance...



Creating the Content...

Syllabus

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics...

*Learning
Outcomes*

3. An ability to communicate effectively with a range of audiences

*ABET 1-7
Outcomes*

7. An ability to communicate effectively with a range of audiences...

Creating the Content...

Syllabus

*Learning
Outcomes*

*ABET 1-7
Outcomes*

Deliverables?

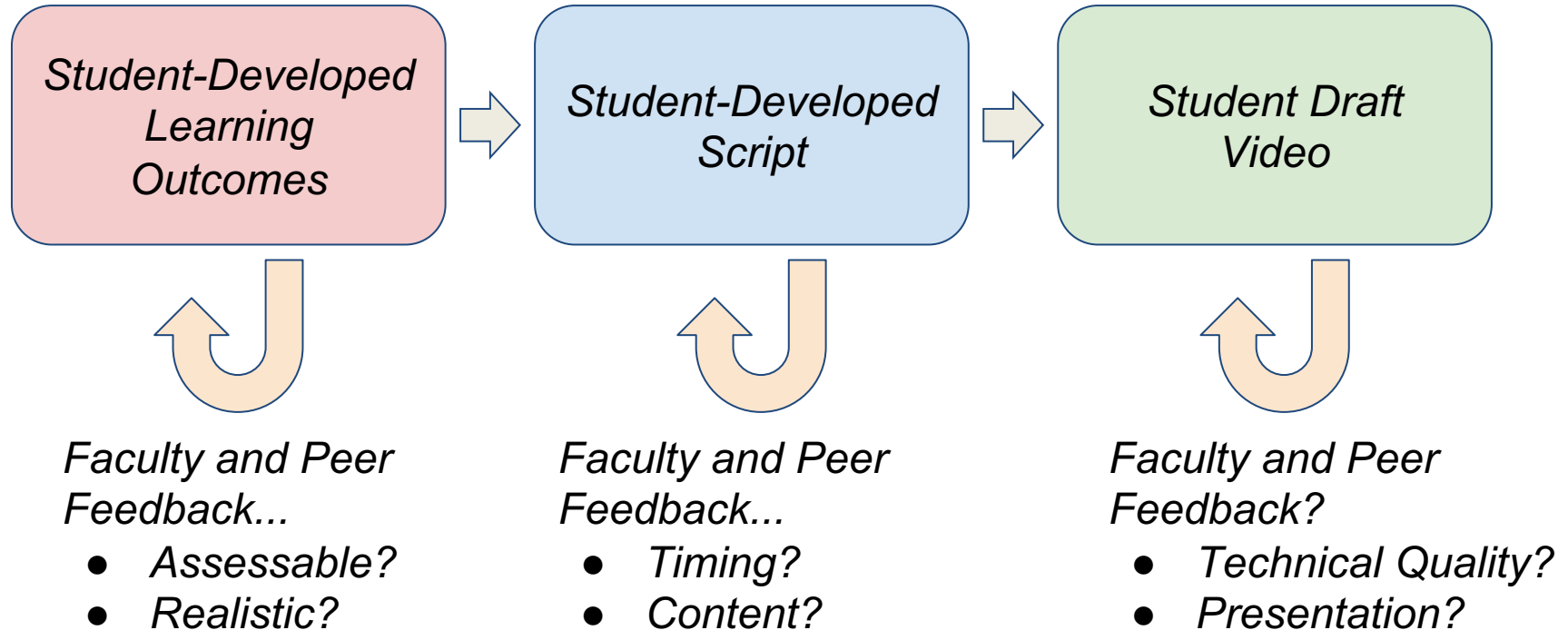


Faculty Consultation



Two 8-10 minute videos

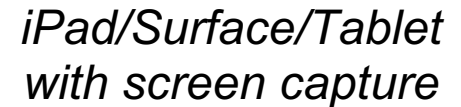
Creating the Content...



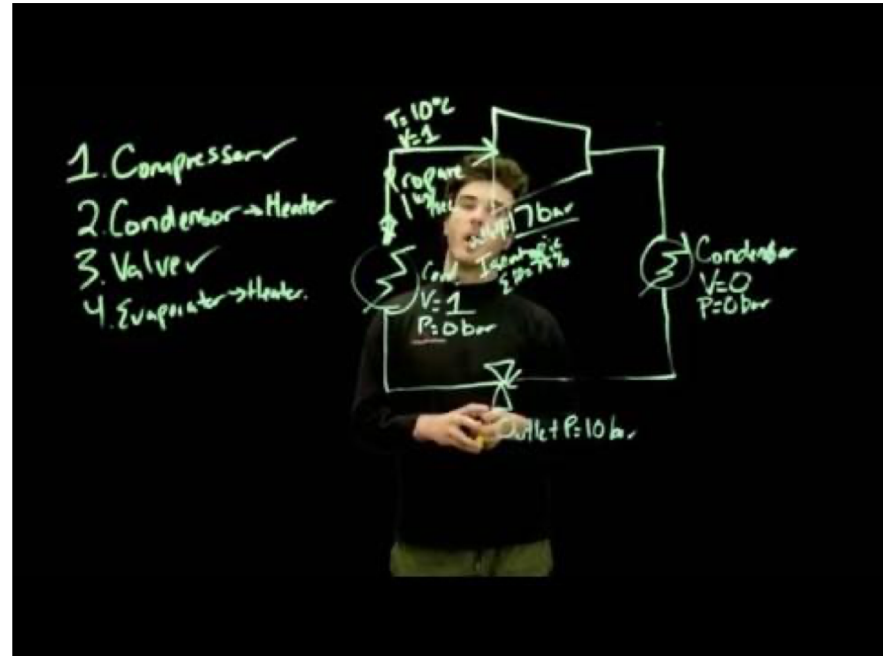
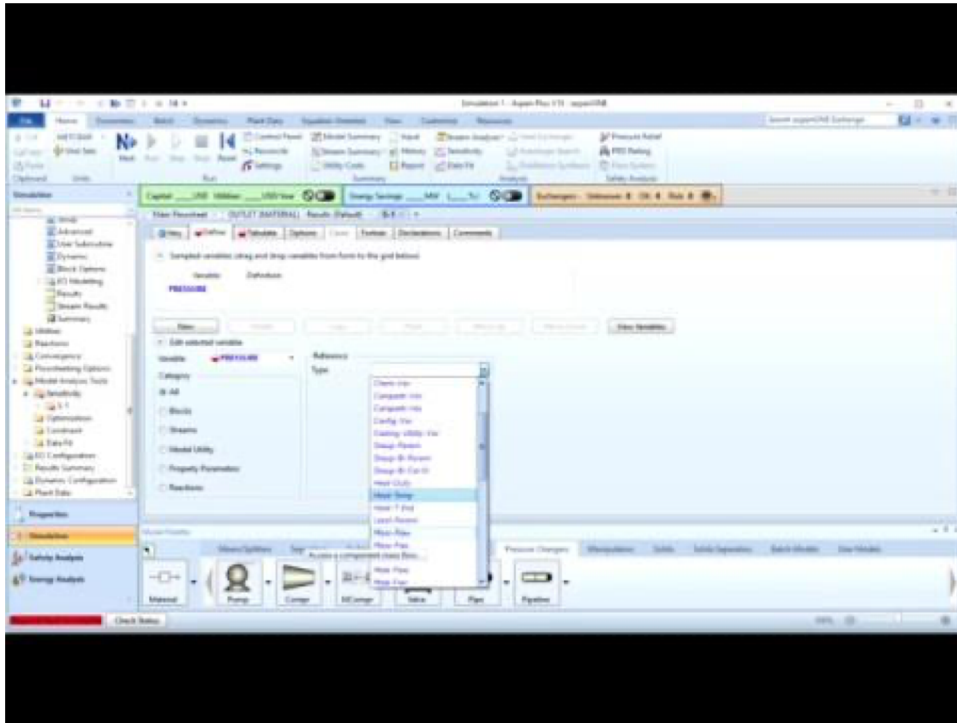
Tying it all together...



- *Six to seven weeks per video - two per semester*
 - *Idea - script - iteration - filming - iteration - assignment generation*
- *Assignment with solutions*
 - *Reflective of the originally developed learning outcomes...*
 - *Turn-key solution for faculty: module, assignment, solutions...*



How did it turn out?



Next Steps...

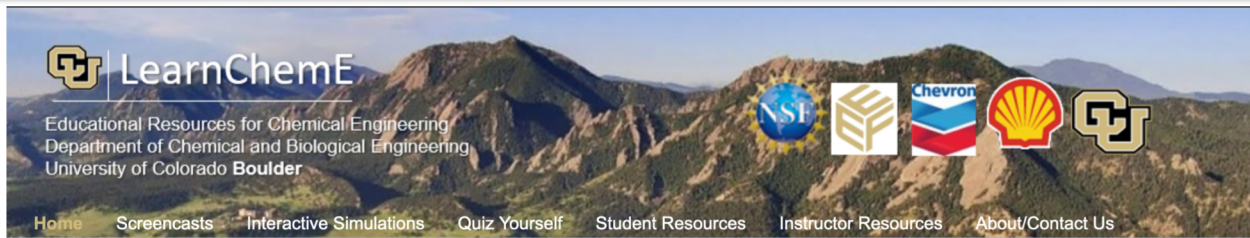
*Pilot - Spring 2019/
Fall 2019*

- ✓ Reduced amount of time in Simulations class spent on teaching “how to ASPEN”
- ✓ Four students = Eight videos
- ✓ Applicable to 4-5 courses across curriculum
 - Intro to ASPEN
 - Thermo I and Thermo II
 - Fluid Mechanics
 - Heat Transfer

*Take 2 - Spring
2020/ Fall 2020*

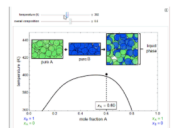
- ? Expand S20 elective to 10 students = 20 videos
- ? Expand simulation/computational packages
 - ASPEN
 - COMSOL
 - MATLAB
 - Python/NumPy/Matplotlib
- ? Develop internal website to host and organize

Thinking Bigger?



Screencasts

More than 1,650 screencasts, which are short screen captures of a tablet PC with narration. They include example problem solutions, explanations of concepts, software tutorials, introduction to topics, diagram descriptions, and reviews.



Interactive Simulations

More than 200 chemical engineering simulations that allow the user to determine how system behavior changes when variables are changed.



Student Resources

Resources on how to study/learn, screencasts for FE exam preparation, screencasts that demonstrate POLYMATH software use and the corresponding POLYMATH files.



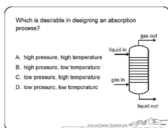
Interactive Self-Study Modules

More than 40 modules; most include: introduction, ConcepTests, introductory screencasts, important equations, interactive simulations, quiz-yourself simulations, example problem screencasts, and key points.



Step-by-Step Interactive Simulations

More than 20 simulations that use a step-by-step procedure in which the user inputs an answer, and then checks the "solution box" to see the correct answer. These simulations are useful for thermodynamics, separations, and/or material and energy balances courses.

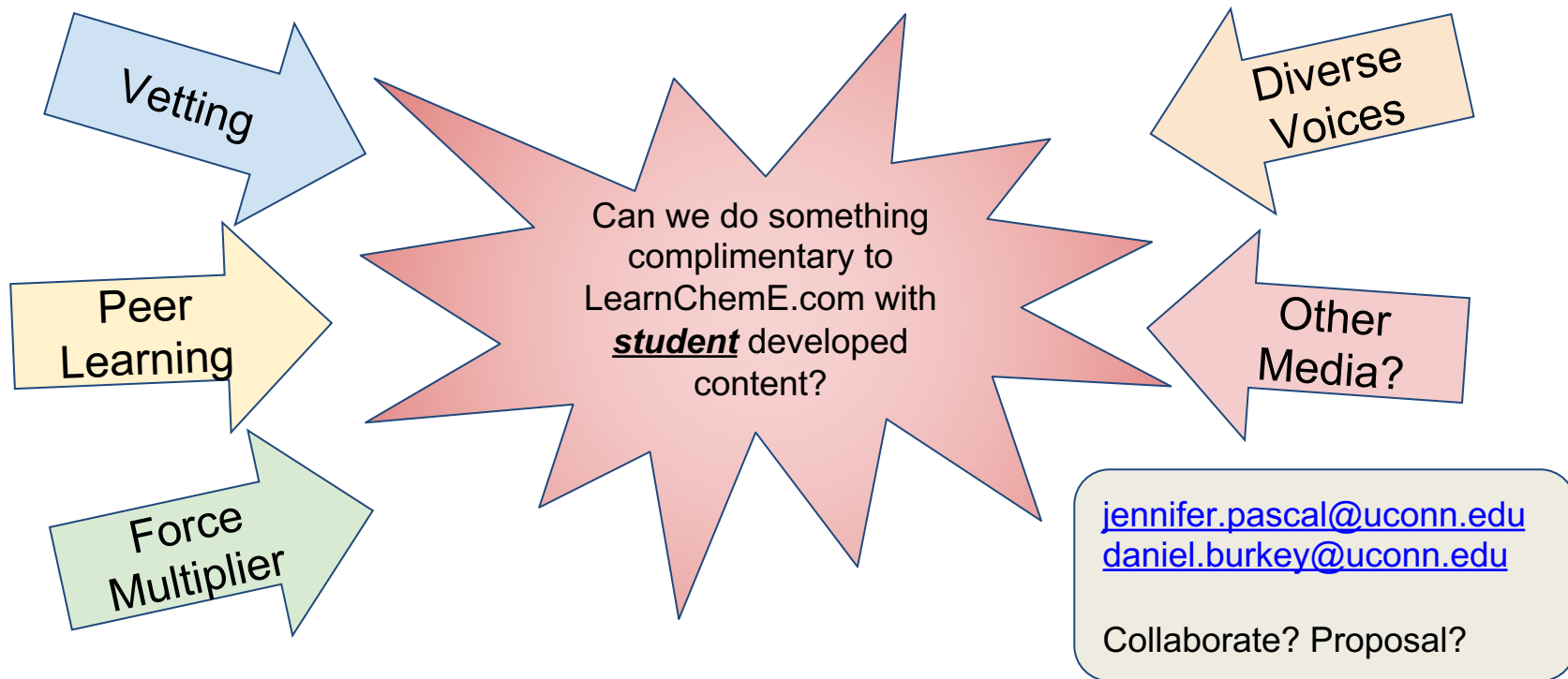


Instructor Resources

More than 1900 ConcepTests, which are conceptual questions that can be used with peer instruction. Three OneNote-based course packages that contain class notes, ConcepTests, reading assignments, screencast recommendations, homework problems, and exam questions.

Faculty Developed Content!

Thinking Bigger?



Acknowledgements

- UConn Department of Chemical & Biomolecular Engineering
- School of Engineering Undergraduate Programs
- Adam Pangilinan
- Students!
 - Ethan Chadwick
 - John Petersen
 - Linda Rivera
 - Kelly Rodgers
 - Connor Yanicky