Thermo Virtual Community of Practice (VCP)

Session 5: Instructional activities – Part 2: Interactive learning techniques

May 1, 2013

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Tentative Agenda

- Introductions, Objectives ~ 10 min
- Peer instruction mock run ~ 10 min
- Participants' reflections vs. lecture ~ 5 min
- Concept Warehouse tour ~ 15 min (group)
- Bucknell Inquiry based activities ~ 5 min (group)
- Silverthorn tips for active learning ~ 5 min
- Wrap-up and next week ~ 10 min

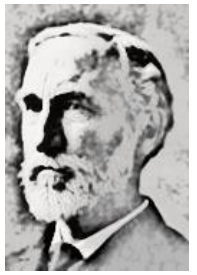
Team Flow

Ganesh Balasubramanian
Iowa State

Jeff LaMack
Milwaukee School of Engineering

Melissa Pasquinelli
North Carolina State

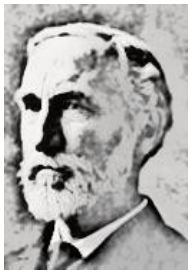
Georg Pingen
Union



Nastaran Hashemi
Iowa State

Team Energy

Nihad Dukhan
Detroit Mercy



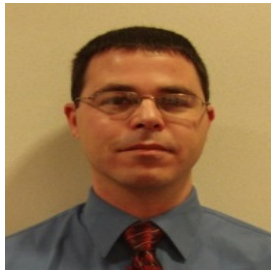
Calvin Li
Villanova

Krishna Pakala
Boise State

Hessam Taherian
Alabama at Birmingham

Robert F Richards
Washington State

Killer Watts



Jamie Canino
Trine

Heather Dillon
Portland

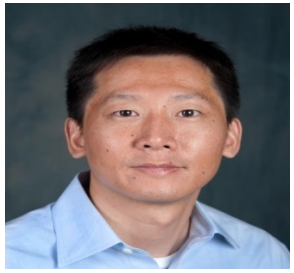
Edwin Wiggins
Webb Institute

Joseph Tipton
Evansville

Team Green Engineering

Margot Vigeant
Bucknell

John O'Connell
Virginia



Zhihua Xu
Minnesota Duluth

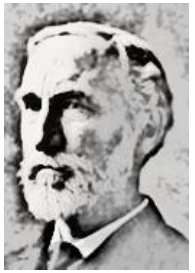
Sapna Sarupina
Clemson

TdS

Sooby Bhattacharjee
San Diego State

Ashland Brown
Pacific

Betta Fisher
Cornell



H. S. Udaykumar
Iowa

Team Cycle

John Chen
California Polytechnic

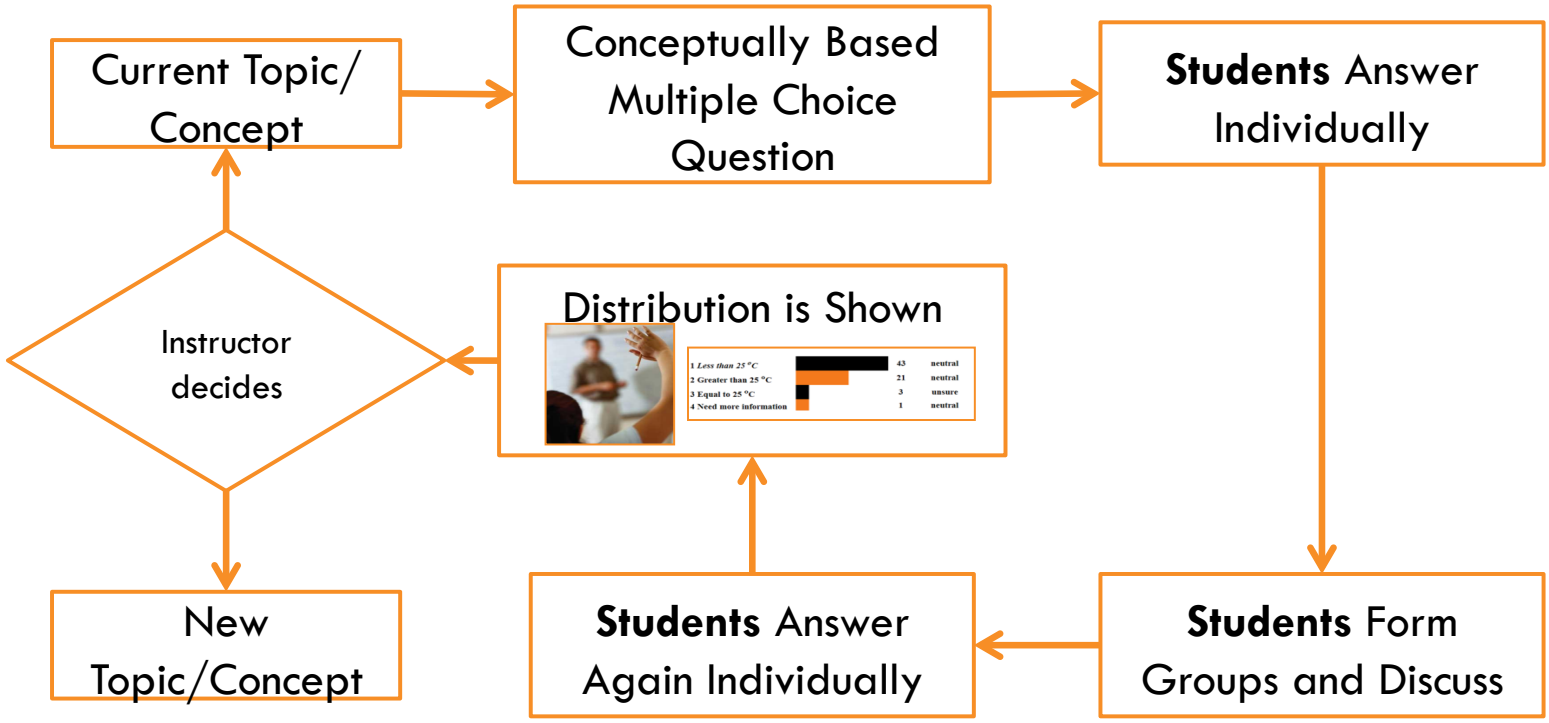
Milo Koretsky
Oregon State

Sadi Carnot
École Polytechnique

Objectives

- Experience one active learning technique "as a student" and reflect on this experience
- Identify resources for ConcepTests, concept inventories, and inquiry-based activities

Peer Instruction – Mock Run



Peer Instruction Discussion

- You just experienced Peer Instruction as a student. What are your thoughts about how this type of learning experience compares with “traditional” lecture

Constructive Alignment (CA)

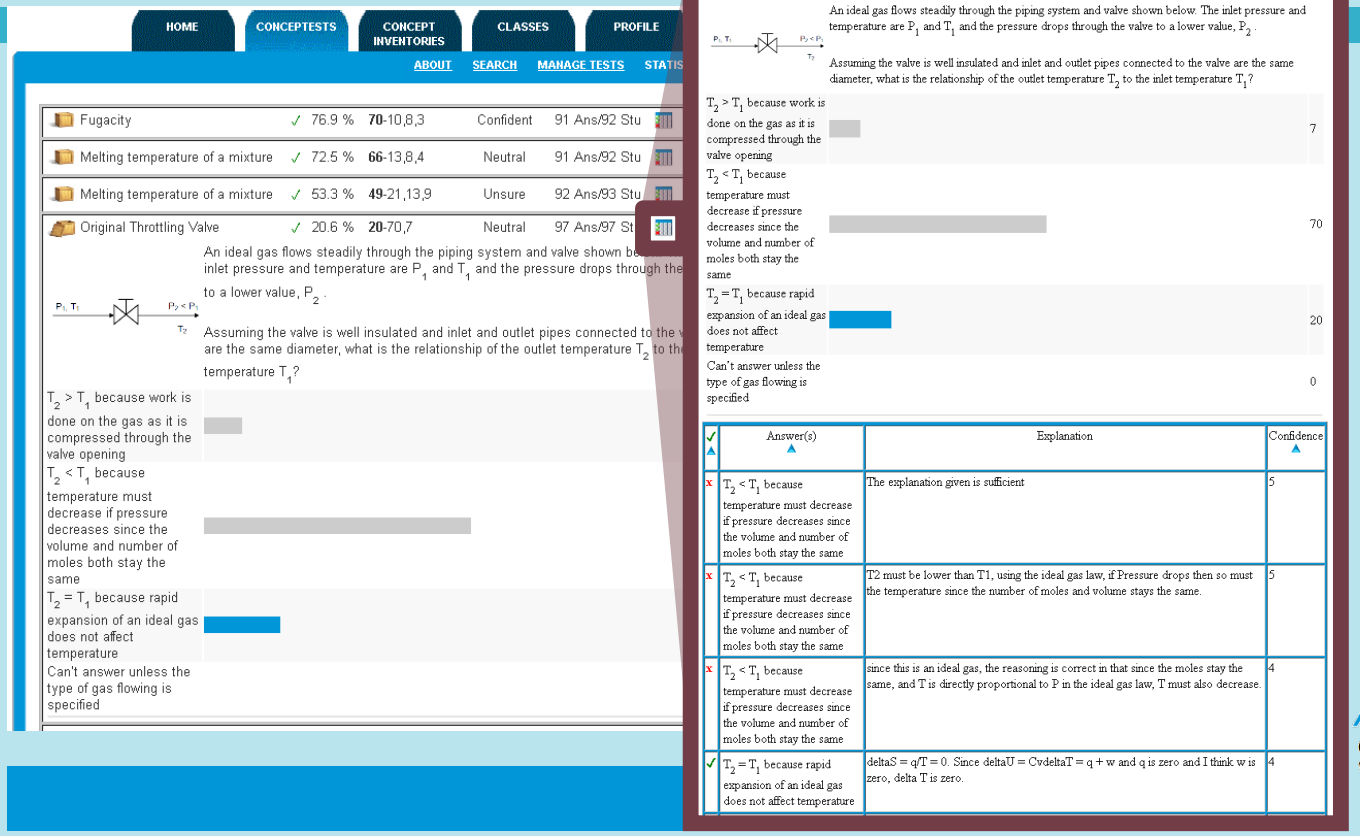
1. All assessments should address one or more pre-formulated learning objectives;
2. Summative assessment of a skill should be done only after adequate practice and feedback in the skill has been provided in class activities and assignments;
3. If a learning objective is important, be it analytical, critical or creative thinking, writing or speaking, or anything else, it should be assessed. The assessment drives the learning.

Richard Felder (*Technical Teaching*)

ConcepTests and Concept Inventories

Type	Assessment	Question Grouping	Quality
ConcepTests	Formative	Single question or set of single questions	Various
Concept Inventories	Summative	An instrument with many linked questions	Valid & Reliable

Concept Warehouse – quick tour



AIChE Education Division
CONCEPT WAREHOUSE

Concept Warehouse: in-class or homework

- Online with cell phones, laptops, and clickers



- Download in Microsoft PowerPoint and Word


AIChE Education Division
CONCEPT WAREHOUSE

Inquiry Based Activities

- Carnot Engine Cycle:
  http://www.facstaff.bucknell.edu/mvigeant/Thermo_JS/Carnot/Carnot-Engine.html
- Piston Cylinder Model:
  http://www.facstaff.bucknell.edu/mvigeant/Thermo_JS/Piston/cycle-modeler.html
- Reversibility of Mixing:
  http://www.facstaff.bucknell.edu/mvigeant/Thermo_JS/Mixing/Mixing.html
- Pump Reversibility:
  http://www.facstaff.bucknell.edu/mvigeant/Thermo_JS/Pump_Reversibility_edit/pump-reversibility.html
- Cough Drop Dissolution (Steady State vs. Equilibrium):
  http://www.facstaff.bucknell.edu/mvigeant/Thermo_JS/Steady_State/steadyState.html

Blog Review


milo.koretsky@oregonstate.edu
Groups
Thermodynamics VCP
Blog
Create content
View
Edit
Track
Subscriptions
Active Learning Activities
milo.koretsky@o...
9:33am Mon Apr 22
Please add a comment to this thread where you Identify ONE active learning pedagogy that you plan to implement next time you teach thermo (or if you are completely satisfied identify the active learning pedagogies that you use)
Print
Print entire section
Close comment thread
#1
Jamie Canino
6:21am Yesterday
Last time I taught thermodynamics I tried the “flipped classroom” model, where I recorded lectures using screencasts from my computer and then had the students do worksheets in class. I can say that I had mixed results due to many different factors. One of which might be that the class was not truly active learning. If you are interested you can read about my experiences in an ASEE regional conference paper (http://ilin.asee.org/2013/index_files/canino2.pdf) .
Recent comments
The in-class activity that I have used in several courses is similar to the one described by Sapna. I pose a problem related
Active Learning Activities
I also use the fill-in-the-black notes idea. I had a few professors over the years who did that so once I became a professor I wante
Active Learning Activities
I have used this technique with undergraduates in teaching Fluid and Heat Transfer. I plan to use this every time I am tea

Dee Silverthorn tips for active learning

- Define your goals and objectives
- Start small and don't change too many things at once.
- Tell your students what you're doing and why, and KEEP TELLING THEM
- Provide students with tools to help them change
- Match the assessment to your teaching style, goals, and objectives.
- Have the right attitude.

Thoughts about Fall

- The intent is to continue in some form this fall
  - Is this time good (poll)
  - Ideas for what we should do and the frequency that we should meet

For Session 6: May 8, 2013

- Read the cooperative learning handout developed by Karl Smith available in the week 6 folder
  https://aseevcp.asee.org/?q=thermovcp/node/383
- Review the Myers Briggs type Indicator
  http://web.cortland.edu/andersmd/learning/mbti.htm
  http://www.myevt.com/teamdev/building-your-teams-type-table
- Identify ONE hint for using teams in class or ONE thing you struggle with and post it on the BLOG:

  https://aseevcp.asee.org/?q=thermovcp/blog
- Update your syllabus based on VCP this far with track changes – incorporate an active learning strategy or two.