Using Reflection to Support Student Learning

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Outline for today:

► What do we mean by reflection?
► How does reflection connect to teaching?
► Identifying and supporting reflection in engineering education
  - A grant
  - A list
  - A **brief** worked example
  - A url

What do we mean by reflection?

reflection...

...on past experiences

...to inform future action
Connecting to teaching: from Dance to Dewey

► “Reflective writing can be used to chart student progress over time, helping connect a student’s cognitive processes to what occurs during studio practice, thus creating a more comprehensive picture of the student’s learning and growth.” (Cooper, p. 6, 2013)

► “...students learn by doing, but only when they have time to reflect—the two go hand in hand.” (Ambrose, p. 1, 2013)

(Cooper, 2013; Ambrose, 2013)

“People often need help in order to use relevant knowledge that they have acquired, and they usually only need feedback and reflection so that they can try out and adapt their previously acquired skills and knowledge in new environments.” (Bransford et al., p. 203, 1999)

► ... we must learn to make our own interpretations rather than act on the purposes, beliefs, judgments, and feelings of others...[t]ransformative learning develops autonomous thinking.” (Mezirow, p. 5, 1997)

► “To ‘learn from experience’ is to make a backward and forward connection between what we do to things and what we enjoy or suffer from things in consequence.” (Dewey, p. 164, 1922)

(Bransford, Brown, & Cocking, 1999; Mezirow, 1997; Dewey, 1922)
Connecting to teaching…

► How have you supported student reflection in your teaching?
► Turn to your colleague next to you
  ● Briefly state how you have supported student reflection in your teaching
  ● Please jot down your idea on a sticky note and leave it on a flip chart after the talk

Atman, 2015 April

Our story…

► Two years ago, we proposed that educators like yourselves are already supporting reflection, but we don’t hear about because we just don’t talk about.
► We proposed a consortium that would give educators a platform for describing their activities.
► We got funded.
► But would it work?

Atman, 2015 April
Our story...

► Two years ago, we proposed that educators like yourselves are already supporting reflection, but we don’t hear about because we just don’t talk about.
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► But would it work?
► Yes

Identifying and supporting reflection in engineering education — a grant

► Consortium to Promote Reflection in Engineering Education (CPREE)
► The Leona M. and Harry B. Helmsley Charitable Trust
► Cataloguing 120 examples of reflection in engineering education across 12 campuses (Year 1)
  ● Field Guides
► Promoting reflection (Year 2)
  ● 18,000 student experiences
  ● 240 educator experiences
Identifying and supporting reflection in engineering education — starting a list

► Muddiest point or minute cards
► Journaling/prompted writing
► Exam wrappers
► Course reflection
► Portfolios

Characteristics of good team members
- Jim Borgford-Parnell, CELT

Course wrap-up
- Alyssa Taylor, BioE

Presentation design debrief
- Kate Mobrand, HCDE

Choices for successful learning
- Sonya Cunningham, CoE STARS

Exam wrapper
- Colleen Craig, Chemistry

Reflecting on design processes
- Cindy Atman; HCDE, CELT
Adding to the List at UW: CTL Learning Community this quarter

- Focused on reflection in STEM education
  - Various reflection activities
  - Motivating students to reflect
  - Helping students reflect more effectively
  - ...and more
- Thursdays, 1:30–2:20 pm, CTL
- Contact Ken Yasuhara, yasuhara@uw.edu

Identifying and supporting reflection in engineering education — an example

- Research findings on design expertise (Atman)
- Leading to ideas to use reflection to help students learn about design processes (McDonnell and Atman)

(McDonnell & Atman, 2015)
Design research findings...

First-Year #1 (Quality Score = 0.37)

First-Year #2 (Quality Score = 0.45)

First-Year #3 (Quality Score = 0.62)

Graduating Senior #1 (Quality Score = 0.38)

Graduating Senior #2 (Quality Score = 0.53)

Graduating Senior #3 (Quality Score = 0.63)


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Using Reflection to Teach Design

► Activity: Representing Design
- Create new representations from design timelines
- Do your own design, reflect on your experience of designing and represent your own design process

► Activity: Creating Design Memory Aid
- Look back and reflect on the activities during the research seminar
- Create a representation to help you remember about design processes in your future career


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Reflecting on design processes:

Representing design

The harder I work, the luckier I get.

Creating design memory aid
Identifying and supporting reflection—
adding to the list

 ► Muddiest point or minute cards
 ► Journaling/prompted writing
 ► Exam wrappers
 ► Portfolios
 ► Feedback forms: What surprised you?
 ► Team experiences as learning
 ► Course wrap-up
 ► Strategy for a class presentation
 ► Have you made good choices today?
 ► Your idea 1
 ► Your idea 2
 ► Your idea 3
 ► ...

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Consortium to Promote Reflection in Engineering Education

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Adding to the list at UW: to participate in CPREE contact:
Ken Yasuhara yasuhara@uw.edu
For more Information

- Reflection

- Design

CPREE


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CPREE acknowledgments

CPREE UW Team

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Lauren Thomas, Ph.D.
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Consortium to Promote Reflection in Engineering Education
www.CPREE.UW.edu

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