

## **Muddiest Point in the Lecture (Muddy Cards)**

### **Muddy Cards are One Type of End-of-Class Feedback**

#### **End-of-Class Feedback**

- Allows student reflection which increases retention
- Assists students in using time to study effectively
- Provides information to instructor in time to correct misconceptions by the next class meeting
- Is more effective than asking for questions
- Assists instructor in planning course for next offering

#### **Muddy Cards – Background**

In 1989, Frederick Mosteller's article, "The 'Muddiest Point in the Lecture' as a Feedback Device," appeared in *On Teaching and Learning: The Journal of the Harvard-Danforth Center*, Vol. 3, 1989, pp. 10–21.

- Mosteller, a statistics professor at Harvard, advocated using the last three or four minutes of every class to ask students these three questions:
  - What was the most important point in the lecture?
  - What was the muddiest point?
  - What would you like to hear more about?
- Muddy Cards are a variation of the One-Minute Paper technique (Angelo & Cross, 1993, *Classroom assessment techniques*, 2<sup>nd</sup> ed., San Francisco, Jossey-Bass) specifically designed to determine gaps in student comprehension

#### **Muddy Cards – General Procedure**

- Hand out 3x5 cards near the end of lecture
- Specifically ask for feedback – "In the next 3 minutes, please reflect on the lecture & write down the point you found the muddiest & need clarification about."
- Collect the cards
- Review cards & decide on a format for addressing the muddy points, such as
  - Post questions & answers on course web page
  - Answer questions at start of next class meeting
  - Prepare a handout
  - Include in recitations
  - Send an email to the class

#### **Muddy Cards – Experiences in Aero/Astro courses at MIT**

##### Faculty Experiences

- Usually ask for Muddiest Point only
- Some faculty find their use very informative in planning lectures & future offerings of the course
- Some faculty are disheartened by what they find out from the cards
- It can create a great deal of work for faculty to go through the cards & address the Muddy points if done in a formal way
- A searchable database of common questions/muddy points and their answers is being created & may help with the time factor
- Remind students every 3 weeks about importance of doing muddy cards

##### Student Experiences

- Many students find them useful
- Students find them most useful when the answers are posted on the web
- Some students feel it helped them focus their study efforts
- Some students found that they became too routine & therefore not useful
- It is unclear whether students are able to judge if/how the use of Muddy Cards affected their retention of the material

## Tips for Using Muddy Cards Effectively

### Remind students of the *student* advantages of Mud Cards

- Allows student reflection which increases retention
- Assists students in using time to study effectively by helping them pinpoint what they don't understand - optimizing their study time
- Modern learning theories (e.g. constructivism) suggest that addressing misconceptions and preconceptions is critical for establishing deep conceptual learning (Wandersee, Mintzes and Novak, 1994). Mud Cards provide a data source for determining these misconceptions.
- Some educational researchers believe that students pay greater attention to the lecture if they are expected to identify a muddiest point (Angelo & Cross, 1993)

### Advantages to Faculty

- Provides information to instructor in time to correct misconceptions by the next class meeting
- Assists instructor in planning the course for the next offering

### To Obtain Student Participation

Faculty need to:

- End the lecture 3 minutes early and specifically ask for feedback - "In the next 3 minutes, please reflect on the lecture & write down the point you found the muddiest & need clarification about."
- Encourage participation and avoid disruption by requiring all to remain seated until the 3 minutes have passed
- Respond in some way to the cards; if there is no response students get the message that their feedback is not valued. Here are some ways to respond:
  - Post questions & answers on course web page
  - Answer questions at start of next class meeting
  - Prepare a handout
  - Include in (or ask TAs to include in) recitation
  - Send an email to the class

### Some Alternatives to "Muddiest Point of the Lecture"

- In addition to or instead of "What was the muddiest point?" ask
  - "What was the most important point in the lecture? (also called One Minute Paper)" or
  - "What would you like to hear more about?" or
  - "I was surprised to learn . . ." and ask students to complete the sentence
- In large classes, break students into small groups and ask each group to create a card
- If the technique is getting stale, use it every two or three lectures instead of every lecture