Utilization of Classroom Assessment Techniques in Organic Chemistry

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Classroom Assessment

- Help students learn more efficiently and effectively
- Check how well student learn “middle points”
- Provide information for improvement
- Empower professors and students in learning quality
Characteristics of CATs

- **Learner Centered**
  - Form lifelong independent learners

- **Teacher Directed**
  - What and how to assess, how to respond

- **Mutually Beneficial**
  - Formative
    - Not graded, anonymous
  - Context-specific
    - Class specific

- **Ongoing**
  - “Feedback loop”

**REFERENCE:** Angelo, T.A. and Cross, K.P. “Classroom Assessment Techniques” 1993, John Wiley & Sons
Teaching Goals Inventory

- Self-assessment of Instructional Goals
- Helps professors become aware of goals
- Helps faculty identify CATS

http://fm.iowa.uiowa.edu/fmi/xsl/tgi/data_entry.xsl?db=tgi_data&lay=Layout01&view

Conclusions:

- Unwritten expectations
  - Need to state so everyone is more aware of what is expected
- Assumed expectations were outcomes that would be achieved
- Need to assess outcomes

  Teaching GOALS: 1, 5, 6, 11, 16, 19, 26 and 40
Small Start

Muddiest Point

- Tests **recall and understanding**
- Course Segment Feedback
- Students Responded VERY Seriously
  - Many points were repetitive

**Conclusions:**

- Areas that I assumed that students were bored with were areas that they were struggling in
- Justified further review of the material
- Technique works very well in a course that is **content specific**
Assessment of Skill in Application and Performance

**Student-Generated Test Questions**
- Assess how well students know the material
- Confirm that we are all on the same track
- I learn what student consider
  - most important or memorable content
  - fair and useful test questions

**Conclusions**
- Most of the time the students derive the same types of questions that I ask
- Helps student prepare for upcoming exam and identify additional muddy points
Skill and Analysis in Critical Thinking

**Categorizing Grid**

- Have 5 main classes of reactions: A, E1, E2, SN1 and SN2
- Requested students “sort” all of the reaction features into the identifying categories
  - Ex: Strong nucleophile goes with SN2

**Assesses and enforces effective categorization and recall**
Assessing Course-Related Learning and Study Skills

Process Analysis

– Provides information on how students carry out assignments and study for exams
– Identify elements of process that are difficult for students
– Conclusions: Students follow same basic steps to learn the material.
  - Students answer honestly (only half read the book)
  - I didn’t expect there would be as much emphasis on problem similarity in studying
  - Sharing productive strategies with entire class for potential study-skill improvement before finals
“First I attempt problem on my own.” 12
“I read the questions and look through the notes to see which ones are similar to the homework assignment questions and solve them.” 17
“If I can’t find them in the notes I go through the book and try to find the closest examples and use them.” 17
“If I have any other questions I usually ask classmates, study group, and just double check my answers with them.” 7
“Any major questions just ask professor.” 2
“Google” terms and chemicals online 1
Exam

- Read the chapters (at least chapter Summary) to understand concepts better. **9**
- Go through the assigned, practice, and chapter problems. **14**
- Read notes and highlight important concepts. **7**
- Make flashcards. **12**
- Make a list of reactions memorize, and study from it. **7**
- Make study guide-rewrite all the important notes. **7**
- Study partner **2**
- Look over quizzes **6**
- Use other reference materials **1**
Learner Reactions

Exam Evaluations
- Exams direct student learning
- Student opinion of exam fairness, appropriateness, usefulness and quality of exams

Conclusions:
- Students claimed to “like the exams the way they are” yet listed some recommendations
- Identified fundamental content that students expect to have learned and reasons why
- I asked this question knowing that in my response, I would make at LEAST one modification (that I had anticipated) on the next exams
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