

# 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](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

# Assignment

- “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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