

Strategies that Enhance Learning in the Classroom

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Overview

- Background
- Instructional Objectives
- Course Assignments for all Learning Styles
- Tests and Final Exam Developed to Cover Instructional Objectives
- Two-minute writing assignments
- Feedback throughout semester

Background

- PowerPoint Presentations
- Using WebCT
- National Effective Teaching Institute



Instructional Objectives

- Helps organize course
- Appeal to multi-types of learners
- Serve as study guide for tests and exams

Bloom's Taxonomy

- Knowledge
- Comprehension
- Application
- Analysis
- Synthesis
- Evaluation

Course Assignment for Multi-types of Learners

- Collaborative team work efforts
- Open-ended design project
- Writing assignments
- Homework problems

Tests & Exams that Cover Instructional Objectives

- Make up tests that cover the course objectives
- Make sure students have sufficient time to complete test (students need 2 to 3 times the amount of time instructor needs)
- Have 1 or 2 questions that require higher learning skills
- Always work test prior to giving it

Two-minute Writing Assignments

- Incorporate writing into all classes
- Requires students to read the test prior to coming to class
- Helps students to reflect and retain the material

Feedback throughout Semester

- Students tend to be more satisfied when given the opportunity to provide feedback throughout semester
- Change things that are not going well
- If you cannot change something, tell students the reason

Strategy Implementation

- Homework: 100 points
- Technical Paper: 100 points
- 2-minute Papers: 100 points
- Individual Design Project: 100 points
- 3 Tests: 100 points each
- Comprehensive Final Exam: 300 points

Results: Instructional Objectives

- Test objectives were helpful.
- The listing of testing objectives helped with studying for exams.
- Instructional objectives for each test were helpful.

Table 1. Instructional Objectives Test #3

Class 16 – Filtration
1. Draw a schematic of a rapid sand filter and explain the steps required during filtration and backwashing.
2. Determine the head loss through a clean filter, using the Rose and Kozeny equations
Class 17 – Backwashing
1. Determine the backwash velocity required to expand a filter bed, backwash flow required to expand the bed, the head loss at the beginning of backwash, and the depth of the expanded filter bed.
Class 18 & 19 – Adsorption
1. Distinguish in your own words between adsorption and absorption.
2. Apply the Freundlich and Langmuir isotherms in the design of batch treatment systems.
Class 20 & 21 – Disinfection
1. Distinguish in your own words between disinfection and sterilization
2. Apply Chick’s law to the design of chemical disinfection systems
3. List and explain five major methods used in disinfecting water.
4. Evaluate disinfection methods and select the most appropriate disinfectant and justify your choice.
5. Design a chlorine contact basin for water treatment.

Rating Scale

- Excellent - 4.0
- Good - 3.0
- Fair - 2.0
- Poor - 1.0
- Not applicable - 0.0

Time for Test	3.2	3.4	3.3	3.3
Test Difficulty	3.0	3.4	2.7	3.0
Variety of Test Questions	3.4	3.4	2.7	3.2
Fairness of Grading	3.2	2.8	2.3	2.8
Return Tests Promptly	4.0	3.8	4.0	3.9
Supplemental Materials	2.2	2.4	2.0	2.2
Value of Web Site	N.A.	2.2	2.7	2.4
Value of 2-min Papers	N.A.	2.8	2.3	2.6
Value of Text	2.8	3.2	2.7	2.9
Overall Course Evaluation	3.4	3.4	3.0	3.3

Student Comments 2-Min Writings

- Good way to make us read but don't ask specific questions.
- Forced me to skim reading...I at least looked at the reading, which is a lot more than I did last semester.
- Very helpful to me. If not for them I probably would have not read the text as often.

Student Comments 2-Min Writings

- Helped me to read the material before coming to class, thus helping me to better understand the subject.
- These kept me prepared for class.
- Were a good idea but they need to be more focused and be a surprise. One deliberate question from the reading would help.

Student Comments about WebCT

- I do not like WebCT or find it useful.
- The use of WebCT did not play into my participation in class. I felt the material that was there was nice to have but not a necessity. I did not visit the site often.
- WebCT still has potential for this class. Instead of a place to view files, there could be links to other sites.

Conclusions

- Overall course evaluation rated at 3.3
- Instructional objectives useful in planning and staying on task during the semester.
- An array of assignments was used to appeal to multiple learning types.
- Students rated the tests at 3.4 as representative of instructional objectives.

Conclusions continued

- 2-minute papers rated at 2.6, although students comments indicated it forced them to read the text.
- Students did not seem to appreciate the opportunity to provide feedback throughout the semester
- WebCT was rated at 2.4, and students said they could take it or leave it.

