Kirkwood

Assessment – Cate Sheller

Start Here.
Go Anywhere!

www.kirkwood.edu

About Kirkwood

- Community college serving 7-county region surrounding Cedar Rapids, Iowa
- Over 20,000 annual credit class enrollment
- Third or fourth largest college in Iowa
- Open enrollment policy

About CS @ KCC

- Credit program in Math/Science Department, part of Arts/Sciences Division
- One full-time instructor/coordinator (me)
- Service population includes CS majors (about 120) and Engineering majors (about 250)

CS courses

- CS1: 4-6 sections per year, 20-25 students per section
- "Upper level" courses – small, mostly CS majors:
  - Data Structures
  - Software Design & Development
  - Computer Organization & Assembly Language
  - Discrete Math

Assess why?

- Teaching is my job and I know what I'm teaching – but how do I know what they're learning?
- Assessment is part of professional accountability

Assess why?

- Articulation: my students start with me, but they finish elsewhere
- Assessment provides evidence to help convince potentially skeptical audience (transfer institutions) that my students are prepared for their programs

Assess why?

- Assessment is part of institutional continuous improvement process
- Internal: 5-year C&I departmental reviews
- External: NCA process

Assess what?

- Specific learning outcomes
- Overall performance in terms of:
  - course
  - program
  - gen ed goals

Assess how?

- Tie exam questions to specific objectives
- Example objective from Data Structures: syllabus
  - The student will give examples of situations in which one sort [algorithm] or another is a more or less suitable solution to the problem at hand.

Example test question

2. (15 points) **Rank the following combinations of searches and sorts**, given sorted or unsorted data. You may **assume that the order of magnitude** (big O) **for the entire operation (sort/search combination) is the sum of the big O values for the algorithms involved**. For ranking, **use 1 to indicate the fastest combination, and 5 for the slowest. Show the big O value you used for each sort or search algorithm in the box listing each algorithm**. Be sure to take into account whether or not the data set is presorted. **Use the average case for each algorithm if initial sort state doesn't make any difference**.

Initial sort condition	Sorting algorithm	Search algorithm	Rank
Unsorted	Selection sort Big O:	Serial search Big O:	
Unsorted	Heap sort Big O:	Binary search Big O:	
Sorted	Insertion sort Big O:	Serial search Big O:	
Sorted	Quick sort Big O:	Binary search Big O:	
Unsorted	Merge sort Big O:	Serial search Big O:	

Assess how?

– Detailed rubrics for grading assignments

– Excerpt from CS1 program rubric:

Primary traits

In order to receive a perfect score, a program must:

- be free of errors
- meet or exceed functional specifications and produce required output
- adhere to documentation and style guidelines given in class

PTA

Error-free (35% of score)

5 -- program runs consistently and is free of run-time errors when executed with appropriate test data

4 -- program compiles and runs without error for most test data; may fail or produce inaccurate results under certain conditions

3 -- program does not compile because of minor syntax/structural errors

2 -- program compiles but fails consistently with run-time errors

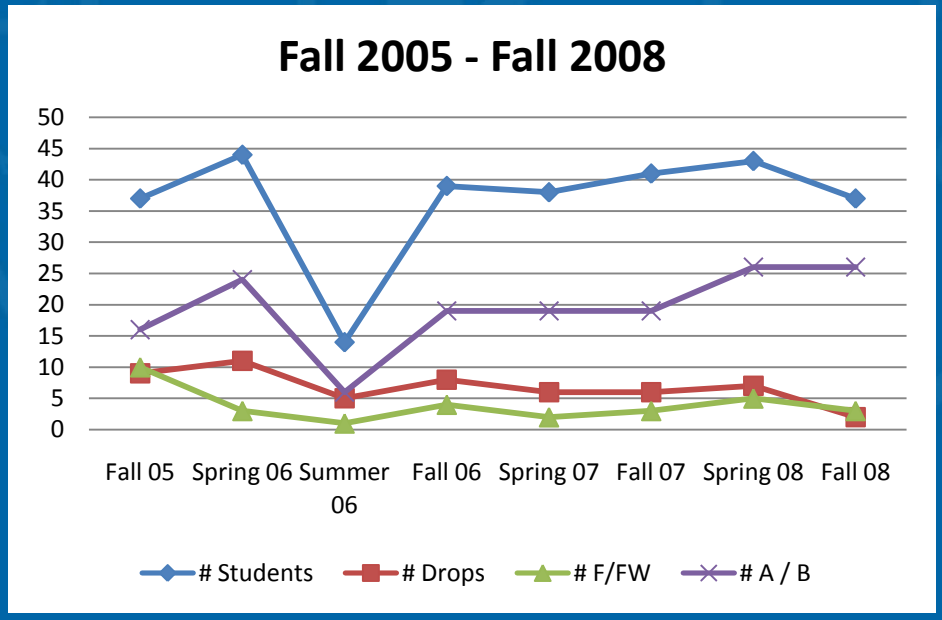
1 -- program is incomplete and/or exhibits serious errors of structure and syntax

Assess how?

- Clickers: instant assessment tool
- Students answer questions embedded in lecture notes
  - immediate feedback, trouble check
  - keeps students engaged

Results tracking

– Graph below shows enrollment in CS1 against success (A/B) vs. failure (F/drop) since clicker adoption (Fall 2006):



Why not assess?

- Time & labor intensive
- Results may not be definitive, clearcut, or to my liking
- Virtue has to be its own reward – no real incentives for doing this
- Conclusion: for me, it's worth it