KEEP/HHMI Data Analysis **2007 Course Surveys**
Bob Milnikel **"Executive" Summary**

This is a summary of the responses of 10 of the 11 participants[1] in the 2007 HHMI Data Analysis Course, part of the KEEP program.

Expectations

1 *This class was different from what I originally expected because:*

The single most common answer was that the students expected more "science" (by which I assume they mean scientific ideas and theories) and less data manipulation/analysis. One student said that there was much more math assumed and taught than s/he expected; one student said that there was much less. One student said that it felt like four independent mini-courses.

2 *I learned (more/less/same) than I originally expected to because:*

Here we had 5 for "more", 2 for "same" and 3 for "less".

Several "mores" focused on the software packages introduced, including Minitab, Origin, and Excel. One student said that the most helpful aspect of the course was the office hours.

Those who cited "same" and "less" had mostly negative comments, with a few saying that the course went too quickly and there was not time to absorb the material. One of these said that the professors kept saying that they assumed several topics were review, when they were not for this student.

Mathematical Preparation

3 *I needed more preparation in the following mathematical concepts before taking this course:*

Most students didn't cite any specific areas. One said that it was all too fast, but didn't elaborate. The following four areas were each cited once:

- Geometric sequences
- Standard deviation
- Precalculus and Calculus (Why, I'm not sure, as Calculus didn't come up at all except once or twice as a passing mention.)
- All topics, but this student went on to praise the level of math instruction as very helpful.

Homework/Modules

4 *I found the homework/modules challenging*

All students said "yes" and some qualified their answers. (The math portion was easy according to one; the assignments tended to the tedious according to another.) A couple pointed out that they were challenging, but at a good and appropriate level.

[1] The 11^{th} student was taking extra time on the final exam.

5 *I would have learned (more/less/same) without homework.*

Almost all said less, and there were few comments. One circled "more" but went on to say that homework was essential and the best way to learn the material. I have to think that this student mixed up the more/less/good/bad distinctions.

Computational Work

6 *I felt comfortable using computers to solve the problems in the course*

All students but one said "yes." The few comments were positive. They were cited as "the best thing about the program" and it was suggested that there be even more emphasis on using the computers.

7 *Computational problems made this course more interesting (yes/no) because:*

Every student said "yes." Some comments:

- You got to see the effects of time increased or decreased on specific data.
- I liked how we learned techniques and then got to use them.
- I wised we spent more time taking through some material before we dived into the computation.
- More interesting because it allows [us] to use math to solve problems in everyday life.

Examples

8 *If I were teaching the course, I would (add/keep/remove) these topics:*

The only topics suggested for addition were Calculus and "natural science."

Topics suggested for retention (once each): Cell data, chemistry & mathematics, biology. One student said to keep all topics.

Topics suggested for removal: Pharmacokinetics (two students), Biology (two students), Physics (one student).

One student said that the course would be better with fewer topics, without more specific suggestions.

9 *The examples were distracting, or made the course more confusing (yes/no):*

Surprisingly, there were 4 "yes" answers. (The others answered "no.") Two specific complaints were about the "unknown problems" and "physics equations we don't need".

10 *The examples made the course more interesting (yes/no):*

There were fewer responses here. Four students said "yes" and two said "no." The one example cited as particularly interesting was the effect of drugs on the body.

11 *I think there should be (more/less) such examples:*

Six students asked for more examples, and one for less. The only other pertinent comment asked for more examples that involved the computer.

Overall

12 *If I were teaching this course, I would organize it differently by:*

Two students said explicitly that they liked the present organization. Two others asked for a more connected course or one with a single focus. The other constructive suggestion was to move the math workshops/lessons to the morning.

13 *The instructor's explanations made sense to me and answered my questions (yes/no):*

All but two said "yes." Two students cited office hours as particularly helpful.

14 *The instructor's examples and illustrations helped me understand the course (yes/no):*

Eight "yes," one "no," and one abstention.

15 *If I were teaching the course, I would add these examples:*

One student asked for more examples of plotting data. That was the only substantive response.

16 *The course was intellectually stimulating (yes/no) because:*

Eight students said yes. A few of their comments:

- It related to everyday stuff.
- There is more to a graph than data and lines.
- Yes, but it moved too fast.

The student who said no said that the course was not well organized and had no clear direction.

One student gave a mixed response, saying that s/he had learned much of the material in high school.

17 *Because of this course I am (more/less) inclined to take classes in:*

Students are more inclined to take courses in Statistics (3), Math (3), Biology (3), and one each in Molecular Biology, Chemistry, Programming, and one for science generally.

Students are less inclined to take courses in Chemistry (3), Physics (2), science generally (2), and one each for Biology and non-statistics Math.

Other Comments

Four students used this section. One was nice enough to compliment one of the faculty specifically. The other comments, paraphrased:

- The professors need to make more of an effort to communicate and coordinate before the course begins. This will eliminate some overlap and some confusion.
- It would be preferable to focus on the material and not on testing and grades. The course need not be for credit to be of interest and useful.
- Six weeks is too long for the KEEP program, but more importantly, three hours is far too long for a science class.