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Physics 4810 / 7810 Week 12 (high noon)

Day 22: Fa2008:
Applying Scientific Reasoning / Design Labs
To Rotational Motion!

Two options for draft:
Tues: with feedback by Thurs
Thurs / Fri: with feedback after break....

Goals of Labs ?

Goals of the laboratory

One can imagine a variety of goals for a laboratory:

- *Confirmation* — To demonstrate the correctness of theoretical results presented in lecture.
- *Mechanical skills* — To help students attain dexterity in handling apparatus.
- *Device experience* — To familiarize students with measuring tools.
- *Understanding Error* — To help students learn the tools of experiment as a method to convince others of your results: statistics, error analysis, and the ideas of accuracy and precision.
- *Concept building* — Help students understand fundamental physics concepts.
- *Empiricism* — To help students understand the empirical basis of science.
- *Exposure to research* — To help students get a feel for what scientific exploration and research are like.
- *Attitudes and expectations* — To help students build their understanding of the role of independent thought and coherence in scientific thinking.

Redish

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Skills Development

what skills are necessary/taught in:

- Traditional Lab
- Design Lab

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what skills needed by:

- Scientific Researcher
- Technician

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Supporting Development

- Consider various forms of “inquiry” or “design”
 - i) Raw: here’s a buck of water, dishsoap and a wisk
 - ii) Challenge: make the tallest soap bubble tower possible. [possible reflection: where / why are the small and large bubbles located]
 - iii) Recipe: step a - e
- What do students prefer? Why?

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Challenges

- Student expectations / epistemology
This type of lab class is the one I would say I would have freaked out over in my first year
- Faculty expectations / epistemology:
I will say that running a design lab sounds much more difficult than a traditional lab.
 - What do faculty need to do differently?
 - What are additional things faculty need to know?

Habits of Mind

- What is going on during design labs

making: Writ- writing; Proc.-Procedure; Rd.-reading
TA - TA help; OT - off task.

Design group						
	SM	Writ	Proc.	Rd.	TA	OT
Labs	37	66	24	5	18	8
1-10						
s.d.	10	12	13	1.7	16.0	9.2
Non-design group						
Labs	14	41	20	4	17	2
1-10						
s.d.	8.4	15.1	10.7	3.2	12.8	1.4

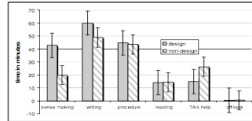


FIGURE 1. The time spent on different activities by teams of students during the final lab exam (biology task).

What did you notice on Rutgers Labs?

- Lab exercise?
- HW?
- How does this HW compare to the 2010 Lab?

Now to work...

- Try out some of the Rutgers Design Lab
15 min

Work through some of the 2010 labs...

What suggestions do you have?