

# PhET and Simulations

Teaching and Learning Physics, Fall 2015

from a principal's publication in 1815: "Students today depend on paper too much. They don't know how to write on a slate without getting chalk dust all over themselves. They can't clean a slate properly. What will they do when they run out of paper?"

from the journal of the National Association of Teachers, 1907: "Students today depend too much upon ink. They don't know how to use a pen knife to sharpen a pencil. Pen and ink will never replace the pencil."

How are people feeling about the Knight readings? To me, they are getting repetitive, and I'm wary about the lack of research or explicit theory behind Knight's suggestions. I think it would be useful if I was teaching in 2010/2011, but not so much as a general resource.

I think he has had some very good ideas to at least try if you are teaching introductory physics. The reading seems like a "practitioner's guide." However, these ideas will not work everywhere because they are not based on research (often research-based reforms need to be adapted to new environments). I'm not sure how clear it is made to the reader that this book is based on Knight's own experience. I wasn't until today's reading that I began feeling a bit wary about what he was saying. His tone is very authoritative and it seems like you shouldn't question what he is suggesting. I feel like he also is a bit demeaning to students when describing the difficulties they have; there are legitimate reasons to hold these preconceptions and they are not silly ideas.

# Simulations

Tool (not method)

Replace traditional demos or labs

Interactive Lecture Demos, Peer Instruction, JiTT

Use in tutorials

Etc.

## Why Use?

Faster and easier data collection

Facilitates more messing about

Less cognitive load goes to trouble shooting, figuring out equipment, etc.

Directs focus on concepts

Cheaper

Students can access from home, online learning

Work through lab in group (3-4)

What (if any) misconceptions or common student difficulties does this address?

How does this activity draw on the research base?

What messages does this activity send about the nature of science?

What are 1-2 strengths about the activity?

What are 1-2 ways the activity could be improved?

# Electric Field Hockey Circuit Construction Kit