

Science Ed Seminar Fall09

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1:12 PM



SciEdSemina
rTranscript...

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mathematical sensemaking
bridging between symbols and the world
affect and emotion

Data: Physics/EE Double-major; first circuits course; not currently taking lab

wanda makes a clear distinction b/w ideal world and real world
the diana prompt: how would a professional engineer take this course?
course should talk more about how the actual world works
actual circuit
working with a real world circuit, it's not very important to understand the physical

what does she mean by "use the physical method"?

6:13 Yeah it's better to know what happened physically, but...
one interpretation: she's throwing the interviewer a bone
support: she tends to say something reconciliatory after dissing the course
Counter-support: when she says that to study the real, you study the how it's different from the physical

it's *different*...if it's even not

David: she knows you're interested in this physical stuff, so she explains things in terms of differences
b/w real and actual

Andy: counterargument is that she brought it up

Is she pissed off?

The physical I think, um, the course should talk more about, um, 26 how the actual world works.

My Q: is it that she doesn't think the ideal isn't important *at all*, it's that the emphasis is way too heavily placed on the ideal in the class, without connecting it up to the actual

what's wanda's perception of what this course was, and how is that affecting her responses here?
conceptual questions where you're not even allowed to write math

[00:15:33.13]

Interviewer:

A
student
whose
opinion
I
hear
earlier
from
your
83
class
had
noticed
that
the
homework
and
tests
seemed
to
contain
two
sort
of
84
types
of
questions- - two
different
kinds
of
questions.
And
I
was
wondering
if
85
it's
been
your
experience
that
you've
noticed

something
like
that.
86
87
[00:15:51.06]
Wanda:
Oh,
you
mean
like
a
physical
question.
Like,
a
theore- - more
88
like
a
theoretical
question?

Joe: by physical she means conceptual!

David: she's getting a feel for her profession...division of labor, you don't need to understand what's going on inside a computer...she doesn't need to understand what's going on in the circuit, except for her somewhat reluctant obligation as a physics major

Yeah, maybe we don't know about physical things...it was just never taught to us

9/14/2009, 2:04 PM

what makes them annoying?
in class we just do the problem-solving part. it's hard to answer...many people go to office hours just going to ask those physical questions

professional engineer, would she think they're hard? yeah.
they're not related to the actual world, her job...that's why I said it's not really necessary for EE majors

Do you think one is more helpful?
problem solving more helpful and more important.

would Diana agree?
Probably.

Beth: does she draw the distinction between EE/physics more sharply because she's a double major?
Data: problem solving skills is the most important aspect

she's not really sure what engineers will do in the future...but she thinks

seems like a contradiction between a lack of sense of prof. engineering early in the interview and she gets comfortable

thorny clip!
why the hedging about Diana

--How do you know when you really understand an equation?--
theoretical methods, physical methods, and problem solving

how do you know when you "get it"?
Have you ever thought, I don't get this equation?
Yes, frequently

think about the physical aspect...

sometimes it works
How do you know when you don't get it?
when I do it too ways and it doesn't agree...go back and think through

getting used to it

Dan: is there a fleeting moment where she says she tries to make sense

21:48.27 think about the physical aspect
does she really mean that or is she just throwing a bone?
Dan: but what makes you think she might be throwing a bone here as opposed to later when she talks about doing a problem multiple ways

David: a risk is that it's like your asking her "how do you decide which politician to vote for"?
she makes up

Joe: Ray Hodges's interviews: line integral of the force vs. a real physical argument

formal thing is much harder...but the conceptual 121 way can't be trusted...it's an epistemological issue perhaps rather than a confidence

symbolic form is not the full blend of the physical and mathematical

some students described that he did physical sensemaking things while setting up a problem (what would you expect the waveform to look like...)

Wanda: what do you think would happen if you drove it at a really high frequency
physical sensemaking vs. mathematical sensemaking

it's interesting that she doesn't see "conceptual reasoning" as problem solving skills

are idealizations identical to conceptual, when she uses

the problem-solving skills ARE an idealization
annoyance is not with math...

preference is affectual, right?