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Practicum in Physics Education

Office hours: Monday: ~~2-3~~
3-4 PM

Password: 'electron'

* You can read 'How people learn'
* ITS - Google drive for syr account
* Part 1 of semester project due on 9/14
* Keep asking - Does that make sense?
  Is it ok?
* Teaching reflection - attachment
  - .doc or .pdf
  - last name_week x.pdf

Lotman (1988) → discourse

- Convey meaning → UNIVOCAL
- generate meaning → DIALOGIC

She then attempts to strengthen the match by providing a shared reference point.

Provocative: The authors conclude 'students will acquire a deeper understanding of mathematics when they use their own statements'

↓

no experimental evidence, no inline citation of such a research.

Confusing: Making the right decision of the proportion of universal & dialogic in teaching

Interesting: Stored reference point -- term

How people learn

* Learning changes the physical structure of the brain
* Effective learning from the 'wisdom of practice'
  ↓
  i.e. good teachers
* Nobel laureate Herbert Simon wisely stated, the meaning of 'knowing' has shifted from being able to remember & repeat information to being able to find it & use it.
* Found educational environments have been better at selecting talent than developing it.
* If students' initial ideas & beliefs are ignored, the understandings that they develop can be very different from what the teacher intends.

1) Analysis (Also reading)
2) Comprehension
3) Designing an experiment
4) Inferring
5) Inferring

Observing
Hypothesizing
Application

(c) 1) Does the volume chaje on applying pressure?

(c) 2) How long can you stretch it?

↳ Malleability question

(c) 3) ~~Often~~ At what temperature will it liquefy?

Convert a convergent question to a divergent question

(d) 3) What experiment can you - - -

Tips

* In what way -

In what way does calculus explain velocity

* Set up an ~~optogy~~ analogy

Implication of cognitive studies for teaching physics

Corollary: A proposition that follows from one already proved.

Interesting: Point (6) of page 2

Principle 3 It is very difficult to change an established mental model

Anecdote: A short & amusing or interesting story about a real incident or person

→ Construction Principle
→ Assimilation Principle
→ Accomodation Principle

* When one of the answers in a group is right

↓

Tell them that one of you is right

↓

Why don't you arrive on a consensus on which is right?

(Most times this is effective)

* If you justify your action, the students will follow you anywhere.
* Self-selected groups is very bad in long term. There is a software, which based on a survey, collects dissimilar people.
* Research shows that for a set of same cognitive skills

↓

the more social

* To make a mathematical problem more interactive

↓ divide problem into smaller parts

↓ take the help of a classmate to help out if it's an algebra problem

↓ take your own rough paper & do calculations on them

↓ they should redraw pictures & redo calculations

* Never use any difficult technique before doing to see whether simple techniques will do the job.

Schonfeld

↓

* It's a lot easier to analyze behavior when it's someone else's & then see that the analysis applies to yourself.

* "Before we try this suggestion, is everyone sure he understands the problem"

* "If you make sure you understand the problem before you jump into a solution, you are less likely to go off on a wild goose chase"

* In the traditional sense, apprenticeship does much more than training

* Students are remarkably insecure, especially in a course of this nature. Working on problems in groups is necessary: one sees that his fellow students are also having difficulty, and that they too have to struggle to make sense of the problems that have been thrown at them.

Mazur

* What to do only if 1 or 2 students answers your question?

1) Ask them to write answer in their books

2) Discuss with your neighbour. Try to convince the other

3) Then ask students to come up with their ans.

↓

Interests having got affirmation from their neighbour, more likely to voice their opinion now.

Lisa Meeting - About poster

1) Learn act

2) Apply WS

3) How to get more studs?

4) How to improve activity?

→ There was no pre-test

How to quantify improvement?

* Put Scanned as was in poster