

EECS

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MY TAKE ON EXPERIENTIAL PEDAGOGY

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THE PROBLEM

You cannot make students understand something by simply teaching it.

True understanding comes only when they actively adapt what they already know to accommodate the new.

*Hence constructing new knowledge is dependent on **epistemologies, belief systems, and sense of purpose** that they bring with them.*



Prior Knowledge

Carl Wieman (2017). *Improving How Universities Teach Science: Lessons from the Science Education Initiative*. Harvard University Press. ISBN 9780674972070

FIRST-YEAR CLOS [OBJECTIVES, NOT OUTCOMES]

I want to teach students to:

- ☐ THINK IN STEPS

not in timeless formulae (contrast with math/phys)

- ☐ SWITCH HATS

between abstraction levels as needed

- ☐ FIRM UP THE LANGUAGE

*words matter: bracket, parenthesis, or brace
reason about: argue logically in plain English*

WHAT DRIVES OUR STUDENTS?

I chose to study this field because:*

☐ IMPACT

make a difference ... change the World

☐ EXCITING

cool ... not boring ...

☐ JOBS

abundant ... high paying ...

☐ SHOW AND TELL

create something tangible ... take pride

*I made it a point to ask first-year students every year. These are the most recurring in the past 25 years.

THE SOLUTION

We found that if you want me to truly learn something, you need to engage me, and I only engage if I perceive the material as relevant.

Immerse the CLOs that you like me to learn in a medium that is dear to my heart—that speaks to my aspirations.

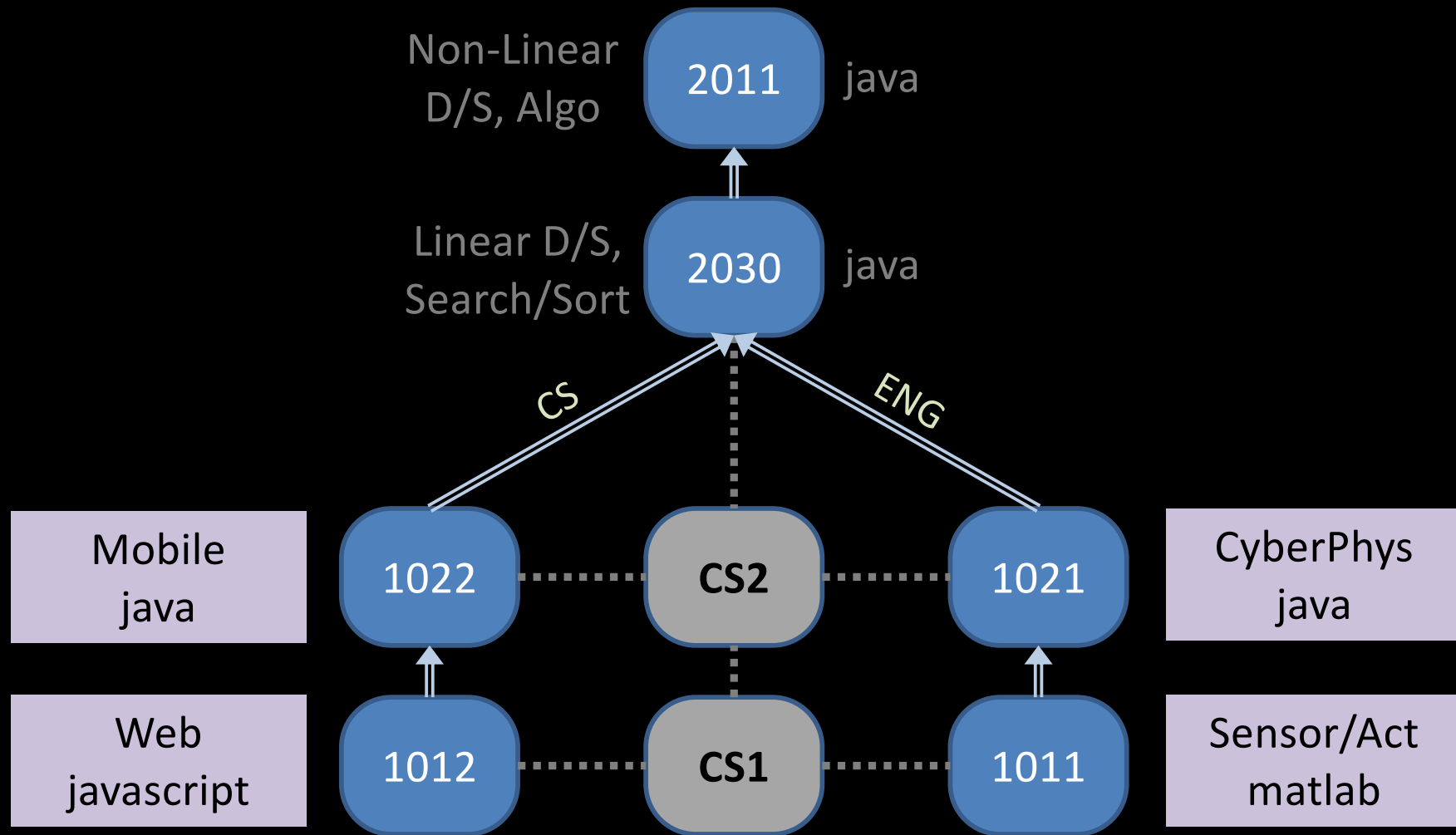
Express the CL-Objectives using the terminology of the medium. This yields the CL-Outcomes, which informs the assessment: Objectives \Rightarrow Outcomes \Rightarrow Assessment

Example: if the medium is the web then:

Think-in-steps \Rightarrow Program; Switch Hats \Rightarrow MVC; Firm-Up \Rightarrow Justify your code

EECS INTRO SEQUENCE

Let's "experientialize" CS1 and CS2:



SELECTING A MEDIUM

Plenty of technologies but it has to be:

- ☐ RICH ENOUGH
to accommodate all the objectives
- ☐ RELEVANT
as perceived by students
- ☐ COMPATIBLE
with the tapestry of the program

PITFALL: *even though outcomes and assessments talk about the medium, the course is **not** about the medium!*

HOW WE LEARN?

A brief history of the pursuit:

- CONFUCIUS, XUNZI, ARISTOTLE
I do I understand
- M. MONTESSORI
the choice ... the medium
- J. PIAGET, K. LEWIN, J. DEWEY
constructivism and cognitive theories
- D. KOLB
the experience-reflect-conceptualize-apply cycle