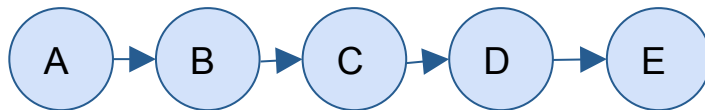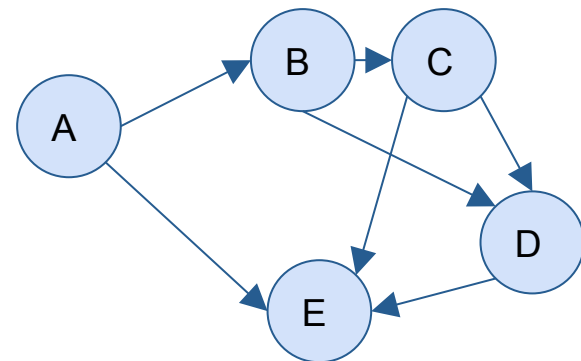# How Learning Works: Expertise and Instruction

How are Experts Different?

- Experts do not necessarily know more facts, they have more connections between them
- Denser 'knowledge graphs'
- Connections as important as facts: more connections to a fact makes it memorable
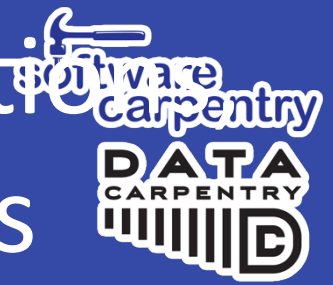
Competent practitioner

Expert

Limitations of Expertise

- Obvious conclusion to an expert
- Fluid representations
- Better at diagnosis and troubleshooting
- Blind spot
  - Expertise-reversal effect

Exercise 1: Fluid Representations: Diagnosis and Blind Spots

- Give one example of a fluid representation that you use in your own work or an example of a fluid representation that might occur in a Carpentry lesson
- What is an error message that you encounter frequently in your work? How you would explain that error message to your learners?
- What is your potential blind spot?

Dismissive and Demotivating Language

- The use of the 'just' word
- Implies students' problems are trivial -> hence they must be stupid
- Betrays an expert blind spot

Exercise 2: Changing Your Language

- What words can have the demotivating effect? What alternatives are positive and motivational?

Motivating phrases (Courtney Seiter):
if, could, yes, together, thank you, choose to, because, willing, the person's name

Demotivating phrases (Jason Fried):
need, must, can't, easy, just, only, fast

You Are Not Your Learners

- You are an expert teaching a novice
  - They do not care about hash tables!
- Way to overcome the limitations of experts -> think about goals and motivations of students
  - Teach something immediately useful
- SWC/DC is not Computer Science
- Discouraged if told something is easy

Reflective Practice (Again)

- Formative assessment -> can help with overcoming blind spot:
  - It doesn't matter how easy you think a task is, if your learners aren't getting it, it's probably more complicated than you thought.

Summary

- How are experts (you) different from your learners (novices)
- Strategies for compensating expert blind spot
- Strategies for avoiding demotivating language