Creating a Positive Learning Environment:
Motivation and Demotivation

Motivation – A Paradox

People learn best when they care about a topic and think they can master it

vs.

Most scientists just want to do science:
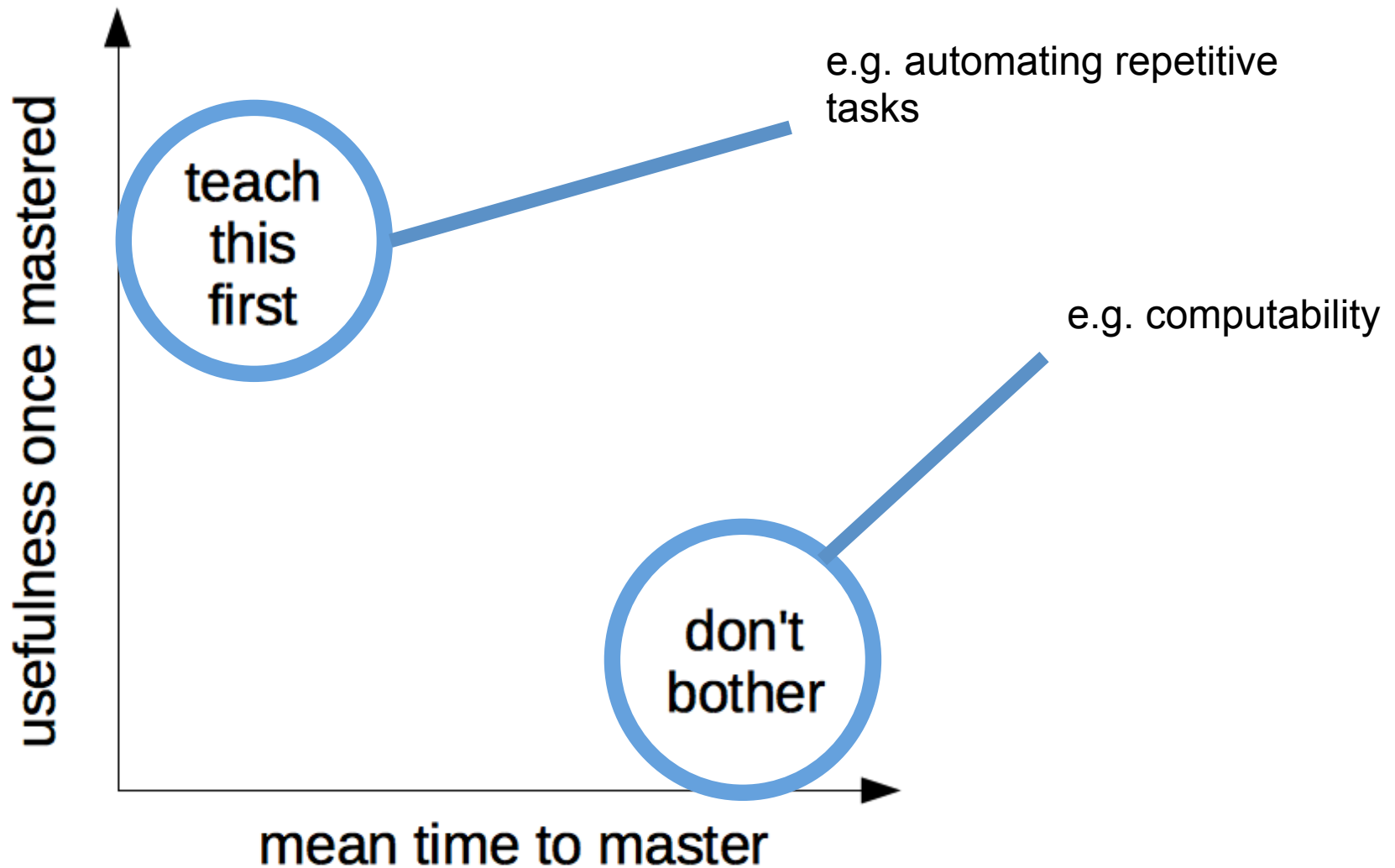
Programming seen as a tax

Early programming experiences often demoralising

A Positive Learning Environment

- Crucial to establish workshop as a comfortable and 'safe' space for learning:

  - Presenting the instructor as a learner

  - Establishing norms for interaction

  - Encourage learners to learn from each other

  - Acknowledging learner confusion

e.g. automating repetitive tasks

teach this first

e.g. computability

don't bother

usefulness once mastered

mean time to master

"Teach most immediately useful first"

- Learners do something useful in *first 15 minutes* of lesson
  - Something they can apply in daily work
  - "I can learn this stuff"
  - "This will allow me to do science faster"

What's being taught

Reduce this gap

Their actual work
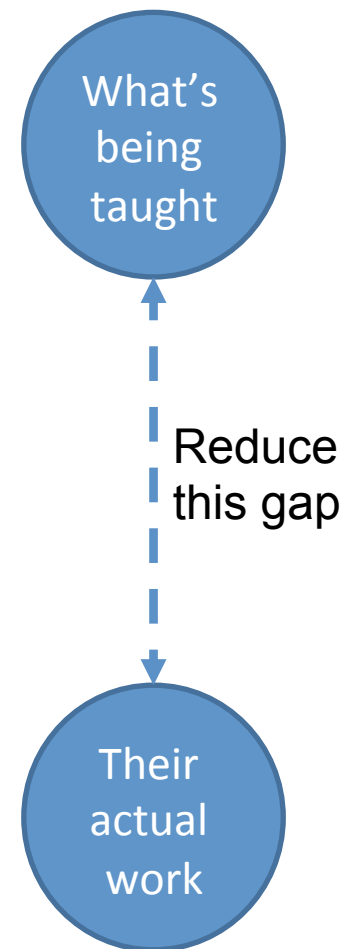
Think about Authentic, Tangible Tasks

- e.g. *media computation* approach
  - Guzdial and Ericson, Georgia Tech
  - Learning a new language, e.g. Python
  - First program opens image, resizes it, and saves it
  - An *authentic task* that is *tangible*

What's being taught

Reduce this gap

Their actual work
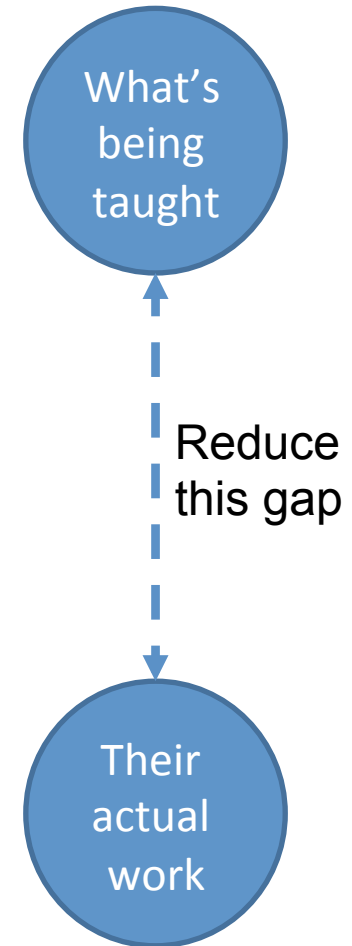
Choose *something you've done that uses one or more of the skills we teach*

- *e.g. wrote a function, bulk did some stats in R, forked a repo*

Think *how you would use it (maybe simplified) as an exercise or example in class*

Pair *up with your neighbor and decide where this exercise fits on a graph of "short/longtime to master" and "low/high usefulness"?*

In the Googledoc, ***share*** *the task and where it fits on the graph*

Motivation Strategies

- Strategies to establish value
    1. Connect the material to students' interests
    2. Provide authentic, real-world tasks
    3. Show relevance to students' current academic lives
    4. Demonstrate the relevance of higher-level skills to students' future professional lives
    5. Identify and reward what you value
    6. Show your own passion and enthusiasm for the discipline

Exercise 2: Strategies for Motivating Learners

***Group** together in twos or threes.*

*From list of strategies copied into the Googledoc, **choose** three of these points and briefly discuss how you could apply these strategies in a workshop.*

***Share** your thoughts for these three points in the Googledoc.*

Exercise 3: Brainstorming Motivational Strategies

Think *back to a course you took in the past, and identify one thing the instructor/teacher/lecturer did that motivated you.*

Pair *up with your neighbor and discuss what motivated you.*

Share *the motivational story in the Googledoc.*

Demotivation

- Two biggest: **indifference** and **unfairness**
- Other things you shouldn't do in a workshop:
  - Tell learners they are rubbish because they use Excel and/or Word
  - Repeatedly make digs about Windows and praise Linux
  - Criticize GUI applications (and by implication their users)
  - Dive into complex discussion with 1 or 2 people
  - Pretend to know more than you do
  - Use the J word ("just")
  - Feign surprise - saying things like "I can't believe you don't know X" or "you've never heard of Y?"

Think *back to a time when you demotivated a student (or when you were demotivated as a student).*

Pair *up with your neighbor and discuss what you could have done differently in the situation.*

Share *the demotivational story in the Googledoc.*

Stereotype Threat

"Self-confirming belief that one may be evaluated based on a negative stereotype"
– study.com

- Don't reinforce those stereotypes
- e.g. around 12-18% of programmers are women
  - Figures getting worse over last 20 years
- Steele's Whistling Vivaldi – strategies for mitigation
  - Increase inter-group interaction
  - Expose students to successful role models from their group
  - Support students' sense of belonging
  - Give feedback emphasizing your high standards and assurance students can meet those expectations

Imposter Syndrome

- Belief that
  - "I'm not good enough!"
  - "My achievement was a fluke!"
  - "I'll be found out!"
- Ask for feedback, look for role models
- When instructing learners
  - Share stories of mistakes – things are hard
  - Make deliberate mistakes!

"We're all faking it" – Instructor Training materials

Accessibility

- Try and ensure a good structure in place
  - **Mobility issues:** [Liz Henry blog post](#)
  - **Visually impaired:** [W3C Accessibility Initiative checklist](#)
  - **Hearing impaired:** [interview with Chad Taylor](#)
- [WebAIM](#) – 'visually check' online materials
- Involve people with disabilities in decisions
- Do easy things first: fonts, text size, room access

Measures taken to improve accessibility aid everyone