



# Instructor Training

Cambridge

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Karin Lagesen, Steve Crouch

[karin.lagesen@gmail.com](mailto:karin.lagesen@gmail.com), [s.crouch@software.ac.uk](mailto:s.crouch@software.ac.uk)

# Background

- Software & Data Carpentry
  - Volunteer researchers, educators, and more
  - Develop lessons, teach 2-day workshops
  - Basic computing and data skills for researchers
  - Emphasising best practice
- What will we do here?
  - Skills for *teaching*, emphasise *best practice*
  - Show evidence and overall SWC/DC philosophy
  - Applicable across all lessons

# What happens afterwards?

- We won't cover workshop content in detail
- You get to do this after this course!
- Instructor Training 'checkout procedure'
  - For a SWC/DC lesson: submit a change request to fix issue or suggest improvement, provide feedback on issue or pull request
  - Participate in hour-long group discussion of lesson
  - Demonstrate live coding in group session

# Basic Format

- Etherpad for questions!
  - <http://bit.ly/ITCam2016>
- For each lesson
  - Some theory of learning, or tool for teaching
  - Hands-on exercises and discussion
  - Sticky notes!
- If you would prefer not to be photographed, please let us know!

# Agenda



09:00 Welcome

09:10 Introduction

09:40 Novices and Formative  
Assessment

**10:40 Morning coffee**

10:55 Teaching as a Performance Art

11:55 Morning Wrap-up

**12:10 Lunch**

13:10 Expertise and Memory

**14:25 Afternoon coffee**

14:40 Performance Revised

15:25 Cognitive Load

16:05 Afternoon Wrap-up

16:20 Finish

09:00 Live Coding

**10:15 Morning coffee**

10:30 The Carpentries

11:30 Carpentry Teaching Practices

12:00 Morning Wrap-up

**12:15 Lunch**

13:15 Motivation and Demotivation

14:00 Lessons and Objectives

**15:00 Afternoon coffee**

15:15 Afternoon Wrap-up

16:00 Finish

# Code of Conduct

- <http://software-carpentry.org/conduct/>

## Code of Conduct

Software Carpentry workshops are community events intended for networking and collaboration as well as learning. We value the participation of every member of the scientific community and want all attendees to have an enjoyable and fulfilling experience. Accordingly, all attendees are expected to show respect and courtesy to other attendees throughout the workshop. The same standards of behaviour are expected in Software Carpentry spaces online.

To make clear what is expected, everyone taking part in Software Carpentry events and discussions—instructors, helpers, organizers, and learners—is required to conform to the following Code of Conduct. Organizers will enforce this code throughout events, but you may also contact us directly by email at [admin@software-carpentry.org](mailto:admin@software-carpentry.org). All communication will be treated as confidential.

### *Code of Conduct*

Software Carpentry is dedicated to providing a harassment-free experience for everyone, regardless of gender, sexual orientation, disability, physical appearance, body size, race, nationality, religion, or choice of text editor. We do not tolerate harassment of participants in any form.

1. Harassment includes offensive verbal or written comments related to gender, sexual orientation, disability, physical appearance, body size, race, or religion, sexual images in public spaces, deliberate intimidation, stalking, following, harassing photography or recording, sustained disruption of talks or other events, inappropriate physical contact, and unwelcome sexual attention.
2. All communication should be appropriate for a professional audience including people of many different backgrounds. Sexual language and imagery is not appropriate for any event.
3. Be kind to others. Do not insult or put down other participants.
4. Behave professionally. Remember that harassment and sexist, racist, or exclusionary jokes are not appropriate.

Participants asked to stop any harassing behavior are expected to comply immediately. People violating these rules may be asked to leave the event or be excluded from the online venue at the sole discretion of the organizers, without a refund of any charge that may have been levied.

Thank you for helping make this a welcoming, friendly event for all.

*This code of conduct is a modified version of that used by [PyCon](#), which in turn is forked from a template written by the Ada Initiative and hosted on the [Geek Feminism Wiki](#).*



So what's  
behind it all?

# Educational Psychology

- The study of how people *learn*
- Two perspectives:
  - **Situated learning** – where learning and application occur in the same social context
    - Essentially, our learners
    - From a novice to contributing community member
    - Legitimate peripheral practice

*WHY we teach*
  - **Cognitivism** – neuropsychology
    - The low-level mechanics

*HOW we teach*

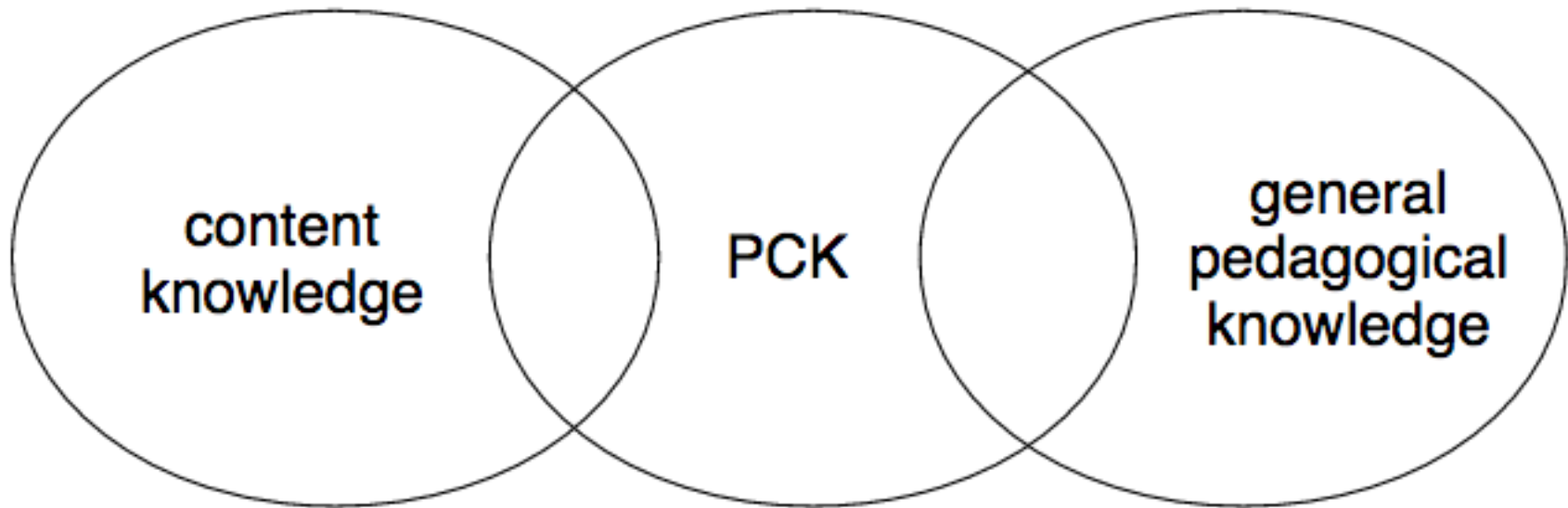


# Instructional Design

- But, we need to *apply* educational psychology
  - Conceptually, EP is too large!
  - Need to try out methods in actual classes
  - Assess those methods
- Apply through *Instructional Design*
- **Educational Psychology** is the *science*
- **Instructional Design** is the *engineering*

# Pedagogical Content Knowledge

- Can only teach what we know...

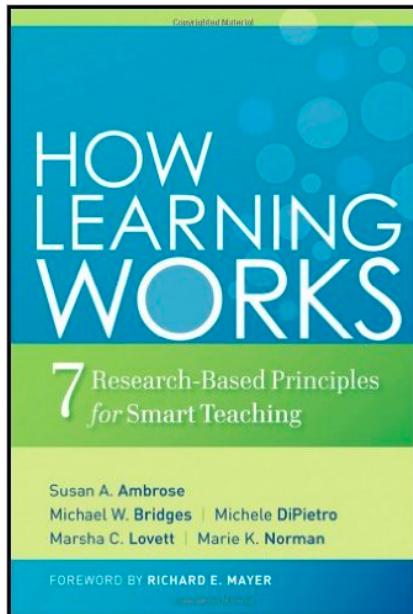


*The 'what' – the things we teach  
e.g. function parameters*

*e.g. what examples to use when teaching how parameters are passed to a function*

*Understanding of psychology of learning*

# Books



## How learning Works: 7 Research-Based Principles for Smart Teaching

- Ambrose, Bridges, DiPietro, Lovett, Norman

## Building a Better Teacher: How Teaching Works (And how to teach it to everyone)

- Elizabeth Green

