Welcome to The Carpentries Etherpad!

This pad is synchronized as you type, so that everyone viewing this page sees the same text. This allows you to collaborate seamlessly on documents.

Use of this service is restricted to members of The Carpentries community; this is not for general purpose use (for that, try etherpad.wikimedia.org).

Users are expected to follow our code of conduct: https://docs.carpentries.org/topic_folders/policies/code-of-conduct.html

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Carpentries Instructor Training

Trainers:

- Kelly Barnes - kbarnes@carpentries.org
- Luis Villanueva - villanueval@si.edu

Dates: August 16 - 17
Time: 9 am - 5 pm (Eastern Daylight Time)
Zoom: https://carpentries.zoom.us/my/carpentriesroom1?pwd=VElzMTlMcXh1bjF6YXl3L1NsTllldz09

Important Links
Instructor Training Curriculum - https://data-lessons.github.io/instructor-training/
Workshop Website - https://villanueval.github.io/2021-08-16-ttt-online-EDT/
Cuckoo Timer - https://cuckoo.team/2021-08-16-ttt-online-EDT

August 16 - Day 1

Sign in: Name / Pronouns / Location / Institution / Email & Twitter (optional)
Please sign in so we can record your attendance.

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Introduction Question: What is your favorite scent/smell?

- Rose water
- Coffee
- Bourbon whiskey
- Lavender
- Grass
- Coffee, also chocolate
- Freshly-baked bread (because coffee was taken)
- Ocean at dawn
- Pine trees
- Orange
-
-
-
-
-

Please fill out the pre-training survey at https://www.surveymonkey.com/r/instructor_training_pre_survey?workshop_id=2021-08-16-ttt-online-EDT

Breaktime Poll
What would you prefer? Put an X next to the one you prefer.

- 5 minutes at the end of each hour (e.g., 9:55 - 10:00) X
- one 15 min break in the morning, one in the afternooon XXXXXxX

You can keep track of the time in your current timezone at https://timeanddate.com/worldclock.

Welcome

https://data-lessons.github.io/instructor-training/01-welcome/index.html
Questions:

- What is The Carpentries and how do we approach teaching?
- What should you expect from this workshop?

Objectives:

- Identify common ground with some of your fellow workshop participants.
- Understand a general structure and core goals of The Carpentries.
- Predict what will and will not be covered in this workshop.
- Know where to find The Carpentries Code of Conduct and how to report an incident.

Code of Conduct:

To make clear what is expected, everyone participating in The Carpentries activities is required to abide by our Code of Conduct.
https://docs.carpentries.org/topic_folders/policies/code-of-conduct.html
Any form of behaviour to exclude, intimidate, or cause discomfort is a violation of the Code of Conduct. In order to foster a positive and professional learning environment we encourage you to:

- Use welcoming and inclusive language
- Be respectful of different viewpoints and experiences
- Gracefully accept constructive criticism
- Focus on what is best for the community
- Show courtesy and respect towards other community members

If you believe someone is violating the Code of Conduct, we ask that you report it to The Carpentries Code of Conduct Committee by completing this form: https://goo.gl/forms/KoUfO53Za3apOuOK2

Exercise: Reviewing The Carpentries Experience and Goals
For the multiple choice questions below, please place an "X" next to the response(s) that best apply to you. Then find yourself a spot in the Etherpad below to write a short response to the last question.

Have you ever participated in a Software Carpentry, Data Carpentry, or Library Carpentry Workshop?

- Yes, I have taken a workshop.XXXxX
- Yes, I have been a workshop helper.Xx
- Yes, I organized a workshop.
- No, but I am familiar with what is taught at a workshop. XXxX
- No, and I am not familiar with what is taught at a workshopX

Which of these most accurately describes your teaching experience?

- I have been a graduate or undergraduate teaching assistant for a university/college course.XXXXxXX
- I have not had any teaching experience in the past.
- I have taught a seminar, workshop, or other short or informal course.XX
- I have been the instructor-of-record for my own university/college course.XX
- I have taught at the primary or secondary education level.XX
- I have taught informally through outreach programs, hackathons, libraries, laboratory demonstrations, and similar activities.XXXXX

Why are you taking this course? What goals do you have for today and tomorrow?

- Emily: be equipped to facilitate a carpentries workshop; learn how to better engage participants in an online format
- Farzana:To improve my teaching skills. Learn about effective practices for engaging students in a virtual environment. Learn about Carpentries training.
- Georgia: To be able to lead a carpentries workshop for incoming graduate students at my institution and successfully help them to feel less overwhelmed by R. I'd like them to be able to start working with their data and to feel confident in troubleshooting. For both days, I'd like to feel confident in A) actually leading the material, and B) effectively advertising and setting up the workshop logistics
- Mark: To learn more about the program and what makes a successful online workshop so I can co-teach along with my colleagues who are already running Carpentries workshops
- Nezha: To learn best practices for motivating students, stimulating their interest and efficiently conveying new knowledge and concepts in programming languages and geocomputation.
- Paula:My degree is in biology but softwares are so important to data organization and analysis. I didn't realize that when I started my degree and now I help to organize a weeklong workshop for high school and undergraduate students were the goal is to reduce imposter syndrome and give them an introduction to software code. I am taking this training to become a better TA for the workshop and also to potentially teach in the future.
- Rachel:
- Ronald: To gain a greater understanding of how to effectively instruct people in the field of technology
- Seth: I have teaching experience but not in software; I am curious to know if there are specific teaching approaches to be effective in this subject area.
- Yotam: To learn how to deliver a carpentries workshop so that I can do so at my institution.
- Yuncheng: to be able to host a carpentries workshop (genome analysis). feel more comfortable to teach students using live codes.

This exercise should take about 5 minutes for responses, with an optional 10 for additional discussion as time permits.

A Brief Overview of the Carpentries

- Software Carpentry focuses on helping researchers develop foundational computational skills
- Data Carpentry focuses on helping researchers work effectively with their data through its lifecycle
- Library Carpentry focuses on teaching data skills to people working in library- and information-related roles.

Instructor Training Workshop Overview

- How learning works
- Building teaching skill
- Creating a positive learning environment

- Carpentry history and culture

What We Leave Out

What Questions Do You Have?

Keypoints:

- The Carpentries is a community of practice. We strive to provide a welcoming environment for all learners and take our Code of Conduct seriously.
- This episode sets the stage for the entire workshop. The introductions and exercises help everyone begin to develop a relationship and trust.
- This workshop will cover evidence-based teaching practices and how they apply specifically to The Carpentries.
- Learner motivation and prior knowledge vary widely, and can be quickly assessed with a multiple choice question.

Building Skill With Practice

https://data-lessons.github.io/instructor-training/02-practice-learning/index.html
Questions:

- How do people learn?
- Who is a typical Carpentries learner?
- How can we help novices become competent practitioners?

Objectives:

- Compare and contrast the three stages of skill acquisition.
- Identify a mental model and an analogy that can help to explain it.
- Apply a concept map to explore a simple mental model.
- Understand the limitations of knowledge in the absence of a functional mental model.
- Create a formative assessment to diagnose a broken mental model.

The Carpentries Pedagogical Model

Acquisition of Skill

https://carpentries.github.io/instructor-training/fig/skill-level.svg *Image: Three people, labeled from left to right as "Novice", "Competent Practitioner", and "Expert". Underneath, an arrow labelled "Experience level" points from left to right. The "Novice" is quoted, "I am not sure what questions to*

ask." The Competent Practitioner is quoted, "I am pretty confident, but I still look stuff up a lot!" The Expert is quoted "I have been doing this on a daily basis for years!"

- Novice
- Competent practitioner
- Expert

Mental Models

"All models are wrong, but some are useful."

The power (and limitations) of analogies

Mental Models

"All models are wrong, but some are useful."

The power (and limitations) of analogies

Exercise: Analogy Brainstorm - USE BREAKOUTS (groups of 2-3)

1. Think of an analogy to explore. Perhaps you have a favorite that relates to your area of professional interest, or a hobby. If you prefer to work with an example, consider this common analogy from education: “teaching is like gardening.”
2. Share your analogy with a partner or group. (If you have not yet done so, be sure to take a moment to introduce yourself, first!) What does your analogy convey about the topic? How is it useful? In what ways is it wrong?

This activity should take about 10 minutes.

Analogies at Work: “Software Carpentry”

https://data-lessons.github.io/instructor-training/fig/mental_models.svg *Image: Three collections of six circles. The first collection is labelled "Novice" and has only two arrows connecting some of the circles. The second collection, labelled "Competent Practitioner" has six connecting arrows. The third collection, labelled "Expert", is densly connected, with eight connecting arrows.*

Concept maps
https://data-lessons.github.io/instructor-training/fig/Cmap-Car.svg *Image: Four words inside circles, with labeled arrows connecting them. "Car" is at the top, with an arrow pointing to "engine" labeled as "is powered by." An arrow connects "engine" to "fuel," at left, labeled "requires energy from." Another arrow connects "engine" to "battery," at right, labeled "charges." An arrow connects "battery" back to "car," labeled "is needed to start."*

The process of forcing abstract knowledge into a visual format can often reveal connections you may not have been aware of, or illuminate gaps.

Exercise: Mapping a Mental Model

1. On a piece of paper, draw a concept map of the same concept you discussed in the last activity, but this time without the analogy. What are 3-4 core concepts involved? How are those concepts related?
2. In the Etherpad, write some notes on this process. Was it frustrating? Do you think it would be a useful exercise prior to teaching about your topic? What challenges might a novice face in creating a concept map of this kind? This exercise should take about 5 minutes.

What was this experience like?

- Emily: It was difficult to map the idea to a concept map - after translating to nodes and edges I'm not sure that the resulting map was aligned with the original analogy I meant to convey. Maybe this would be a useful exercise and it would ensure that the idea/concept being taught is tangible and more easy to grasp by learners.
- Farzana: It was enlightening to see how seemingly disconnected concepts can be connected together when more thoughts are put into it. I think it will be useful before starting a topic.
- Georgia: I had to slow down my thinking in order to identify key intermediate steps. I had to redraw it because the spatial configuration that I started with did not make sense.
- Mark: It was really hard to do, which makes me wonder if my initial analogy was too abstract?
- Nezha: It is very useful to review how core elements of the concept are connected and how far this is comparable to the analogy given.
- Paula:
- Rachel:
- Ronald: Drawing the concept map felt less intuitive that the anaolgy. I had a more difficult time limiting details and it felt like it increased the complexity.
- Seth: Challenging! It takes effort to strip away the analogy and map out the relevant concepts. The analogy does a lot of work! A novice would have even more trouble because a concept map requires much more details than an analogy.
- Yotam: Actually very interesting to force myself to think about how all the pieces are connected -- I ended up "discovering" a connection that I hadn't even previously thought of.
- Yuncheng: It was a hard try to fit the concepts into the map. I wanted to make the map more comprehensive but also didn't want to include too many details.

How "Knowledge" Gets in the Way

Misconceptions:

- Factual errors
- Broken models
- Fundamental beliefs

Formative Assessments Come in Many Forms

Exercise: Formative Assessments

Based on your previous educational experience (or even this training so far!) what types of formative assessments do you know about?
Write your answers in the Etherpad; or go around and have each person in the group name one.

- Emily: 'clicker quizzes' that are not graded; checkpoints in labs where learners explain their answers to in-lab questions to the instructor/TA
- Farzana: Breakout rooms with peer feedback, then gather together in large room for collective feedback, Submission of assignments in a forum to receive peer feedback, and then instructor feedback. Completion of quizzes at the end of learning and receive assessment points to correct wrong responses.
- Georgia: In class polling/multiple choice, concept mapping as teams on whiteboards, students create questions that others must answer
- Mark: "Muddiest Point" exercise - asking class either during the session or at the end to write down one thing that still isn't clear; use that feedback to inform the next session
- Nezha: Conceptual maps, summaries, quizzes, polls
- Paula:
- Rachel:
- Ronald: I don't really have any experience with this.
- Seth: In mid-career training sessions I helped run we had students answer polls early in our sessions then again mid-way through to assess their understanding of the subject as we went.
- Yotam:
- Yuncheng: polling/quiz (multiple choice questions)/stickers of what you've learned or what you're still unclear about (usually during the mid-term)

Expertise and Instruction

https://data-lessons.github.io/instructor-training/04-expertise/index.html

Examining Your Expertise

You may not think of yourself as an "expert" but many advantages -- and pitfalls -- may apply to you.

What Makes an Expert?

Exercise: What Is An Expert?
What is something that you are an expert in? How does your experience when you are acting as an expert differ from when you are not an expert?

- Emily: population/evolutionary genomics, biodiversity informatics. I am more 'vocal' when acting as an expert
- Farzana: Statistical and machine learning modeling. When I am acting as an expert, I also learn by sharing my knowledge, and in the process, broaden my understanding of the concepts that I am already familiar with. I get exposed to unfamiliar concepts when I'm asked a question. When I'm not acting as an expert, I am in a learner's mode, where I try to absorb as much knowledge as possible, looking for new concepts that I have not known before.
- Georgia: Statistics, parasitology. My confidence in making suggestions/statements is much greater

as an expert. When I'm not an expert, I find myself taking a very long time to validate my answers. I'm more likely to try new things/be creative in a field that I'm an expert in.

- Mark: Within my working group, they look to me as an expert on issues/questions relating to collection development. There's a confidence level that's higher and also a sense of obligation in the sense that I need to be on top of questions relating to that topic (more so than other areas where everyone knows I'm not the expert).
- Nezha: Remote sensing, GIS and biodiversity. I have a multidisciplinary background, so it is difficult for me to consider myself as an expert in the whole field, but only in some aspects of these fields where I have experience.
- Paula:
- Rachel:
- Ronald: Have always called myself a generalist. Not sure I'm an expert. Working from the point of view as an expert, one might make intuitive leaps when working through a problem because you have an understand of the system as a whole.
- Seth: I am an expert (always getting better!) at using Python for data analysis in multiple disciplines (mostly mortgage finance). My experience as an expert differs in that I feel much more comfortable encountering obstacles as I am confident that I can overcome them without too much time lost (as there are often multiple ways to solve an issue and experts are aware of them), whereas in areas I am not as familiar with my ability to make progress is much more fragile (you may only know one way to solve an issue so any link broken prevents you from solving it).
- Yotam: Astronomy data analysis. When not an expert, I feel much less comfortable and need to look things up much more.
- Yuncheng: Statistical genomics. Being an expert or not: whether I know lots of basic information/shortcuts for the tools/in the field; whether I feel comfortable to comment on the ideas in the field.

This discussion should take about 5 minutes.

Experts have more connections among pieces of knowledge.

Image: Three collections of six circles. The first collection is labelled "Novice" and has only two arrows connecting some of the circles. The second collection, labelled "Competent Practitioner" has six connecting arrows. The third collection, labelled "Expert", is densly connected, with eight connecting arrows. https://data-lessons.github.io/instructor-training/fig/mental_models.svg

Exercise: Awareness Gaps

Is there anything you are learning how to do right now? Can you identify something that you still need to think about, but your teacher can do without thinking about it?

Think about the area of expertise you identified for yourself earlier. What could a potential awareness gap be?

- Emily: I am an amateur potter - 'centering' clay is something that is very difficult for new potters but experts can do within minutes
- Farzana: I am learning how to optimize a model with a specific machine learning algorithm. I still need to think about all the hyperparameters I need to tune, but my teacher already knows them. I think very deeply before using a specific hyperparameter, but my expert teacher does not think of how it's specifically applicable to my research problem.
- Georgia: I'm learning some new DNA sequencing topics; I still have to go back and think about how DNA works! There are probably hundreds of awareness gaps that I have with R, which I use

to do all my stats modeling. It's very hard to stay on top of all the new work/packages coming out.

- Mark: I've started playing saxophone in a group after many years away. I'm not very good at ID-ing the notes that belong in a chord, which makes improvising very difficult sometimes (thinking too much about the chord - an expert doesn't need to do that, and can just focus on playing/creating beautiful lines). Awareness gap - in example above, might be over confident and not recognize an issue/problem related to library collections,
- Nezha: I am learning machine learning. I am still confused when my supervisor use the term model, as I am not sure if he means a statistical model or a simulation. Awareness gap: For some students with no background in computer science, certain concepts are not obvious as they are for me as a teacher. For example, the difference between a file and a folder, the tree view of data storage, the difference between a function and a variable etc
- Paula:
- Rachel:
- Ronald: I'm trying to get up to speed on physical servers and the components that they're comprised of. My predcessor was able to understand right away which parts wuld come by default with a new server, whereas I need to look up each part and double check. When I'm helping patrons on computers, I often ask them the click the menu button, but I've been realizing that people may not necessarily always know what that was.
- Seth: I'm decent at using SQL to access information I need across various tables but still have a great deal to learn. My manager (who has been teaching me) can quickly write a very small amount of code to do something complex that I would take longer to write and with more text.
- Yotam: Designing astronomical observing programs. My supervisor can basically design and implement every aspect of the program optimally on the fly, whereas it takes me significant time and effort to make progress, and even then my results are often not optimal.
- Yuncheng: some statistic models: my mentor can always find one that fits; while I was showing a student the pipeline of ATAC-seq data, found out that he didn't know the basic idea of sequencing.

This exercise should take about 5 minutes.

Bait and Switch

Exercise: What do you use interchangeably?
In the Etherpad, share an example of words or notation that you sometimes use to accomplish or refer to the same thing. If possible, try to think of an example that might occur in a Carpentries workshop.

- Emily: for data science workshops in R we often use tidyverse ecosystem and sometimes I refer to tidyverse as a whole but other times refer to individual packages (dplyr, ggplot) which is confusing for learners. parameter/argument/switch/option
- Farzana: Tree boosting classifier/algorithm/model, features/variables/measures, cross validation/validation (statisticians think of external validation data while I mean my cross validation set to evaluate my training model, not the test set).
- Georgia: In R, I switch between using tidyverse/dplyr methods and base methods ALL THE TIME. It's terrible.
- Mark: I can't think of anything Carpentries specific yet, but I'm sure as a librarian I switch between different descriptions for different tools/concepts that might be confusing for a novice.
- Nezha: Technical terms in GIS: shapefile/vector/polygon, raster/grid, pixel/cell
- Paula: GIS Terms like Nezha! Also different terminals on the computer e.g. R has a terminal, but you can also access the terminal directly
- Rachel:

- Ronald: I might call the 'terminal' program by the name given to it by the desktop environment like 'Konsole', or I might just say from the commandline.
- Seth: In a clustering analysis I've been working on this summer, I interchangeably use the word 'segmentation' and 'clustering' which helps us present our results to business audiences (who are used to hearing the former) but may sometimes confuse data science staff (who use the latter).
- Yotam: bash and command line; git and github; noise and error
- Yuncheng: terms such as "insertion" in the genome. Sometimes it means a real evolutionary change. Sometimes it just means a gap in the genome.

Exercise: Diagnosis
What is an error message that you encounter frequently in your work? (These are often syntax errors.) Take a few minutes to plan out how you would explain that error message to your learners. Write the error and your explanation in the Etherpad.

- Emily: In python TypeError: unsupported operand type(s) for /: 'str' and 'int'. Ask learners to recall what 'str' and 'int' types are. Suggest going back to the line number indicated and checking data types on that line
- Farzana: Syntax error for missing specific characters, like parenthesis, I would explain that the parenthesis needs to be in place to indicate the end of the command, before starting a new one. Errors associated with commands for iteration, for non-iterable items.
- Georgia: There's usually some point when I'm referencing the wrong directory and get a 'file not found' message. I'd explain it by saying that I have to be 100% accurate in the way in which I reference a file path, and the syntax (and use of ""s) needs to be precise (like dialing the wrong phone number -- getting close isn't going to connect me with the right person)
- Mark: In my line of work, I deal with a lot of badly designed interfaces. I'm used to recognizing the flaws and so can quickly correct, but novices might not see the breadcrumbs at first because of how the interface is designed.
- Nezha: 'File does not exist' errors are the one that I encounter the most. Explanation to learner in simple words: The computer navigates through the folders in the hardrive, following the path given, but it cannot find a file with the name specified.
- Paula: Rlang errors in R. First I double check I've spelled things correctly, commas, parentheses, make sure I've loaded the correct package,
- Rachel:
- Ronald: In SQL when joining tables, I can sometimes get way more data back than was expecting. While no error is generated, the data that I'm expecting doesn't map on to what I'm receiving. So think that it would be helpful for learners to have an expectation of what they want to receive and make sure that it matches their output.
- Revathy: "Module error in python" when installing new softwares or packages with dependencies which are not already satisfied. I would usually ask them to check if all the dependencies are satisfied, whether the right version of the dependency is present, if not how to get to the point where you have it all nailed down.
- Seth: While using Python to do a patient clustering analysis, I often got errors related to resource limits. I could explain this by discussing the differences between the clustering algorithms (i.e. some use sampling which dramatically reduces resource utilization). To continue with any lesson on this, rather than the time-intensive process of switching algorithms I would use a subset of the original data for which my computer had sufficient resources.
- Yotam: NameError in python: I would explain about variables and how they're defined, as well as variable scope.

- Yuncheng: "index out of boundary" error in R. explanation: I might try to see whether I messed up the names of the dataset. And then check the dim of the data to and compare it with the index to see what might cause the error.

Keypoints:

- Experts face challenges when teaching novices due to expert awareness gaps.
- Things that seem easy to us are often not experienced that way by our learners.
- With practice, we can develop skills to overcome our expert awareness gaps.

Memory and Cognitive Load

https://data-lessons.github.io/instructor-training/05-memory/index.html
Questions:

- What is cognitive load and how does it affect learning?
- How can we design instruction to work with, rather than against, memory constraints?

Objectives:

- Remember the quantitative limit of human memory.
- Distinguish desirable from undesirable cognitive load.
- Evaluate cognitive load associated with a learning task.

Types of Memory

- short-term vs long-term memory
- 7±2

Exercise: Test Your Working Memory
This website implements a short test of working memory.
https://miku.github.io/activememory/
What was your score? If you are comfortable, share your answer in the Etherpad.

- 7, 7
- 4
- 6 ,6
- 6, 8
- 7, 7
- 4 (then 8 for round 2 :))
- 6,7
- 5,6
- 6, 10
- 6
- 6
-

If you are unable to use this activity, ask your Trainer to implement the analog or adapted version of this test.
This exercise should take about 5 minutes.

Most people will have found they only remember 5-7 words. Those who remember less may be experiencing distraction, fatigue, or (as we will learn shortly) “cognitive overload.” Those who remember more are almost invariably deploying a *memory management strategy*.

Attention is a Limited Resource: Cognitive Load

3 types:

- Things they have to think about in order to *perform a task* (“intrinsic”).
- Mental effort required to *connect the task* to new and old information (“germane”).
- *Distractions* and other mental effort not directly related to performing or learning from the task (“extraneous”).

Is Guided Practice "Hand Holding"?

Exercise: Mapping Cognitive Load - USE BREAKOUTS (groups of 2-3)
Look in the curriculum that you chose to prepare for this workshop and focus on one step or task that learners will be asked to complete.

1. What concepts will learners need to understand and hold in short-term memory in order to complete this task?
2. Draw a concept map connecting these concepts. What relationships do learners need to understand to connect them?
3. How many of these concepts and relationships have been introduced since the previous step or exercise?

With a partner or in small groups, discuss what you have found.

This exercise should take about 15 minutes.

Attention Management in Your Workshop

Creating Exercises
Other Computation Exercises: https://third-bit.com/2017/10/16/exercise-types/

What to Display

Keypoints:

- Most adults can store only a few items in short-term memory for a few seconds before they lose them again.
- Things seen together are remembered (or mis-remembered) in chunks.
- Cognitive load should be managed through guided practice to facilitate learning and prevent

overload.

- Formative assessments can help to consolidate learning in long-term memory.

Building Skill With Feedback

https://data-lessons.github.io/instructor-training/06-feedback/index.html
Questions:
How can I get feedback from learners?
How can I use this feedback to improve my teaching?
Objectives:
Describe three feedback mechanisms used in Carpentries workshops.
Give feedback to your instructors.

Surveys
For links to our surveys see: https://carpentries.github.io/instructor-training/06-feedback/#surveys

The survey links above are only for you to preview the survey as part of Instructor Training. When you are teaching a workshop, make sure to share the links that gets generated on your workshop website. Doing so will ensure that you will receive all the survey results from your workshop participants.

Image: Screenshot of a workshop website showing location of customized survey links https://data-lessons.github.io/instructor-training/fig/surveyscreenshot3.svg

Timing matters

Minute Cards

Be Explicit About Using Feedback

One-Up, One-Down

Exercise: Give Us Feedback
Fill out virtual minute cards: https://forms.gle/JYFwWMPCxnHotJCH8

Key Points

- Give your learners time to fill out the post-workshop survey at the end of your workshop.
- Take the time to respond to your learners' feedback.

Motivation and Demotivation

https://data-lessons.github.io/instructor-training/08-motivation/index.html
Questions:

- Why is motivation important?
- How can we create a motivating environment for learners?

Objectives:

- Identify authentic tasks and explain why teaching using them is important.
- Develop strategies to avoid demotivating learners.
- Distinguish praise based on the type of mindset it promotes.

Motivation Matters

- Any technique can fall flat when learners are not motivated
- In a short workshop, motivation to continue learning independently is a critical outcome

How Can Content Influence Motivation?

- Believing that something will be too hard to learn often becomes a self-fulfilling prophecy.

Exercise: Authentic Tasks: Think, Pair, Share

1. Think about some task you did this week that uses one or more of the skills we teach, (e.g. wrote a function, bulk downloaded data, built a plot in R, forked a repo) and explain how you would use it (or a simplified version of it) as an exercise or example in class.
2. Pair up with your neighbor and decide where this exercise fits on a graph of “short/long time to master” and “low/high usefulness”.
3. In the class Etherpad, share the task and where it fits on the graph. As a group, we will discuss how these relate back to our “teach most immediately useful first” approach.

- Room 1: Writing functions using the case of automating the process of drawing insights from cluster analysis. We agreed that the exercise would be very useful if it is simplifified as it is broadly applicable, and that it would take a relatively small time commitment compared to similarly useful lessons.
- Using unix/linux commands. We agreed it is high usefulness, and that the question of "time to master" is a bit more complicated. Learning the basics of the commands may take a very short time, but a deep familiarity with all their various options, and integrating them into larger pipelines or workflows, may take a very long time. Context is also very important. A given skill may be very useful or not at all depending on the learners work and their career plans going forward.

- Room 4: Building a ggplot: We would first ask students to sketch out their vision for a plot so that they get used to considering the data structure and what type of graph might be best suited for the scientific question. We'd then walk through the steps of building the plot incrementally. As a creative/challenge/extension, we'd ask students to find a way to customize the plot based on another variable in the dataset. Students would evaluate each other's plots and provide feedback as to what works well and what improvements they might consider. We'd estimate that this falls in the 'short time to be competent, and long time to become a master' and 'high usefulness' area of the graph.

Room 2: parallising jobs in an HPC, running simultaneously the same task on different databases. I would say it fits high on the usefulness axis, in the middle on the mastery time axis. We agreed that the commitment time also depends on the level of the learners, as some may be not familiar with the concepts and the tools and might require extra work and practice

How Can You Affect Motivation?

Exercise: Brainstorming Motivational Impacts
Think back to courses you have taken in the past and consider things that an instructor has said or done that you found either motivating or demotivating. Try to think of one example in each case, and share your example under the appropriate heading in the Etherpad.

- Emily: Motivating: my first programming course, in Perl, the 'final' project was to write a code to automate a task from our research. It was very easy to see how learning these programming skills could really accelerate the research process. Demotivating: when a practice problem/task appears to have no relation to my learning goals.
- Yuncheng: Motivating: when I got an error, the instructor said "Let's figure this one out together". Demotiating: In one class, the instructor mentioned "if you're a student in xx department, you should know this..." a lot of times.
- Yotam: Motivating: fun clicker quizzes and group activities. Demotivating: Shutting down questions.
- Nezha: Motivating: I remember a course I took online, where the teacher used a diverse range of activities and included some gamification concepts to encourage students and stimulate their motivation. It was fun and instructive at the same time. Demotivating: the teacher not giving a clear feedback.
- Seth: In a Python course I took last semester, an instructor took time to break out into groups to relate a concept we were learning to an area specific to the interests of subgroups in the class (i.e. for mine this was an application to housing finance). This motivated us as it made it apparent that the concept was directly applicable in our research. A TA I had created a demotivating atmosphere by being dismissive of questions posed by my classmate.
- Georgia: Motivating: instructors validating my question ('that's a good question'), instructors pointing out things that I'm good at. Demotivating: telling me something is simple when I am just learning it for the first time.
- Ron: Motivating: When instructors took steps to show how the subject would relate to tasks that I'd be doing in my job at the library. Demotivating: Instructors making negative comments about

the subject we're working on.

- Farzana: Motivating: You start at an A in this course, and the only way to do worse is not following the guidelines. Demotivating: This is just tough for everyone, it's not about the effort.
- Mark: Motivating: Analogies that allow me to draw connections to previous experience/knowledge. Demotivating: Lack of preparation or enough context to be successful in an assigment/task.
- Paula: Motivating: Instructors sharing their own learning experiences and hurdles in the software, using encouraging and not dismissive language, problem solving on the fly. Demotivating: When practice sessions have answers or suggested answers that seem completely out of the blue or haven't been mentioned before as the main answer, not just another suggestion on how to do it
- Revathy: Motivating: In a course for Advanced Statistics, the instructor used to write down everything on the white board (all calculations and workings) and used to encourage we take it down as notes with each and every step(even if it is wrong) that way when we look back, we get an idea of what our thought process was. Demovitating: The instructor not willing to discuss the answers for quizzes or exams.

Exercise: Helping Learners Learn From Mistakes

A learner at your workshop asks for your help with an exercise and shows you their attempt at solving it. You see they've made an error that shows they misunderstand something fundamental about the lesson (for example, in the shell lesson, they forgot to put a space between ls and the name of the directory they are looking at). What would you say to the learner?

- Emily: I would ask them to do an experiment like just typing ls first, then typing ls name_of_dir, then typing lsname and comparing the output
- Yuncheng: I'll probably ask what he/she wanted to do by this command and try to let him explain each part of the command himself. The student might be able to tell the mistake once he finish the explanation. If the student cannot figure it out, I'll show them the example code again and say something like: it's a common mistake that people always make..."
- Yotam: This is a bit of a touchy subject, and I think it depends on how comfortable/amenable the learner is with feedback. But in general I think it's always best to use a positive tone, identify the specific source of the error, make it clear that this is something "really important " to a good foundation or something along those lines, and then guide them towards correcting the error themselves.
- Nezha: Taking the ls example, I would ask the students questions to check if they understand the basics of writing a command line, break down the command they typed and what each element does
- Seth: I would first try to assess the situation by ensuring that they really do fundamentally minunderstand a key concept by asking clarifying questions or asking them to explain their reasoning. I've found that having people step through their logic often has a self-correcting impact! I would also want to ascertain exactly where they are at in their comprehension. If they really have misunderstood, I would (if resources permit) try to have them go into a breakout room with one of the Carpentries TAs assisting with my workshop so the TA can quickly bring them up

to speed before coming back to the main room. This would be timed to avoid causing the person to miss an important new concept.

- Georgia: I'd say something along the lines of 'that is a really common error', or 'I definitely thought about this like this too'. I would also ask the student to break up the code into small chunks and to explain what they think is happening at each step so that we can identify together where the error is coming from.
- Ron: I'd also to to find something positive to say about the work they had done. I'd want them to feel that they were capable of successfully completing the assignment. From there, I would try to identify the area where the student was misunderstanding. Then go over that part of the lesson with them and have them discuss the lesson with me. I would hope that the student would recognize where they went astray when we came to the relevant part.
- Farzana: I would first ask him about his understanding of how to approach the problem (e.g. looking up a list of files in the directory) and how he/she tried to solve it. Sometimes in reviewing the work, students are able to notice their own mistake, if not, I will point it out, since it is a simple mistake. But if it is related to substantial misunderstanding of a concept, I would ask him to explain the steps he has taken, ask about his understanding, and correct the specific points he didn't get, and refer to supportive resources.
- Mark: I might try to call their attention to the section with the error, and somehow ask to see if they can see what's wrong, and/or to try and put it into the context of something I've done incorrectly myself at one time. I like Yuncheng's earlier suggestion of starting by offering to work through it together.
- Paula: If I could identify the fundamental misunderstanding, I might either try to ask them questions to help them think through to correct it, or if it' s just one of those computer details where it must be done a certain way because we are speaking a computer language, I would explain that the computer only understands our commands in certain written format which is something we have to learn, no problem, and make sure they correct this misunderstanding because of issues that would arise further in their code. If we had covered the topic, then I might try to call their memory back to then or if we truly haven't talked about it then I would admit this oversight.
- Revathy: I would probably ask the person to go through it once again, by giving them some cues and clues, trying to help them figure out on their own what the problem, if that attempt fails, I would point out the mistake and gauge if it was something they genuinely did not know or if it was something that happened because of carelessness. I would try to correct them in a way that they understand why it didn't work out in the first place and the next time, when they attempt the same thing, be careful to not make the mistake again.

Exercise: Choosing our Praises

Since we are so used to being praised for our performance, it can be challenging to change the way we praise our learners. Which of these are examples of performance-based, effort-based, or improvement-based praise?

1. That’s exactly how you do it – you haven’t gotten it right yet, but you’ve tried two different

strategies to solve that problem. Keep it up!

   - performance-based:
   - effort-based: XXXXXxXXxx
   - improvement-based:

2. You're getting to be really good at that. See how it pays to keep at it?

   - performance-based: X
   - effort-based: XX
   - improvement-based: XXXXXxx

3. Wow, you did that perfectly without any help. Have you thought about taking more computing classes?

   - performance-based: XXXXXXXXxx
   - effort-based:
   - improvement-based:

4. That was a hard problem. You didn't get the right answer, but look at what you learned trying to solve it!

   - performance-based:
   - effort-based: XXXx
   - improvement-based: XXXXXx

5. Look at that - you're a natural!

   - performance-based: XXXXXXXXxx
   - effort-based:
   - improvement-based:

First, Do No Harm!

Things not to do in a workshop:

- Talk contemptuously or with scorn about any tool or practice, or the people who use them.
- Dive into complex or detailed technical discussion with the one or two people in the audience who clearly don't actually need to be there.
- Pretend to know more than you do.
- Use the J word ("just") or other demotivating words we talked about in a previous lesson.
- Take over the learner's keyboard.
- Express surprise at unawareness.

Exercise: Why Do You Teach?

We all have a different motivation for teaching, and that is a really good thing! The Carpentries wants instructors with diverse backgrounds because you each bring something unique to our community.

What motivates you to teach? Write a short explanation of what motivates you to teach. Save this as part of your teaching philosophy for future reference.

- Emily: helping people learn tools and skills to enable them to work more efficiently; helping people who have not considered themselves as 'programmers' gain confidence at the command line and writing code and enjoying it!
- Yuncheng: learning from the teaching. Getting new perspectives of thinking the same topic/question from teaching the students. sharing my knowledge to other people.
- Yotam: Student success; learning from teaching; helping people improve/learn new skills; personal satisfaction from being able to accomplish all the above.
- Nezha: I like seeing this sparkle in students eyes when they learn something enlightning or when they achieve a great accomplishment with the things they have learnt. It is a very rewarding moment for the teacher as a guide/facilitator of their learning process
- Seth: Teaching is intrinsically motivating for me as there are few things as personally satisfying as helping someone accomplish something or understand a concept and take pride in their accomplishment.
- Georgia: I am so grateful to my teachers for motivating and inspiring me. I want to pass this on!
- Ron: I'm really interested in encouraing people to use open source software. I want people to feel like the computer is a fun and useful tool that they don't have to be afraid of, but can use to explore areas of interest. I'd like to take the model used in library carpentries and try to adapt it for our patrons with other software such as LibreOffice, AV Software, graphics and audio programs, etc.
- Farzana: I am motivated to improve my Python teaching skills, so that I can train the next generation of programmers with more efficiency. I feel that teaching is the best way to learn and improve on a set of knowledge, and a great way for personal growth by responding to students' inquiries about the subject. I like to interact with my students, and be inspired from their constant curiosity and eagerness to learn.
- Mark: For Carpentries specifically, I want to help my colleagues build a network of support. To help our students get to the point in their research where they can ask a question in their field that no one else has asked before.
- Paula: I wasn't introduced to coding or using software for data analysis until just a few years ago and wow, was the learning curve steep (I'm still on it) but there were several times I felt like the learning could have been made easier, so being able to teach especially the basics to new learners is very important to me so that students can keep going with their studies and not feel like it was way over their heads, esp for underrepresented students
- Revathy: I believe in the ideology that to be a good teacher, you need to be a good learner. I am motivated to teach so that I can deepen my knowledge in that subject at the same time, get inspiration from the student community on how to perceive each idea and concept in more meaningful and creative ways. I believe this widens your scope of thinking too.

Keypoints:

- A positive learning environment helps people concentrate on learning.
- People learn best when they see the utility in what they're learning and believe it can be accomplished with reasonable effort.
- Encouraging participation and embracing errors helps learners to stay motivated.

Equity, Inclusion, and Accessibility

https://data-lessons.github.io/instructor-training/09-eia/index.html
Questions:

- Why are equity, inclusion, and accessibility important?
- What can I do enhance equity, inclusion, and accessibility in my workshop?

Objectives:

- Identify instructional strategies that are consistent with universal design.
- Recognize systemic factors that can distract and demotivate learners.
- Understand the role of The Carpentries Code of Conduct in maintaining an explicitly inclusive environment.

A Positive Environment for All

Definitions

- Equity: The proportional distribution of desirable outcomes across groups. Sometimes confused with equality, equity refers to outcomes while equality connotes equal treatment.
- Inclusion: Actively engaging traditionally excluded individuals and/or groups in processes, activities and decisions in a way that shares power. Inclusion promotes broad engagement, shared participation, and advances authentic sense of belonging through safe, positive, and nurturing environments.
- Accessibility: Refers to the intentional design or redesign of technology, policies, products, and services (to name a few) that increase one’s ability to use, access, and obtain the respective item. Each person is afforded the opportunity to acquire the same information, engage in the same interactions, and enjoy the same services in an equally effective and equally integrated manner, with substantially equivalent ease of use.

The Carpentries Core Values

Exercise: Discuss The Carpentries Core Values

Take a moment to read through the Core Values on this page: https://carpentries.org/values/

Choose one core value that resonates with you. What is a decision you might make in a workshop that could look different if you were actively considering the core value you chose?

- Emily: Inclusive of All: being mindful of how the workshop is being advertised. Are learners from all communities being invited to participate? Are certain communities being excluded?
- Yuncheng: Always learning: I think it's important to learn while teaching (both the knowledge and the teaching skills). Instructors will be able to get feedback and get improvement after each workshop.
- Yotam:
- Nezha: Access for all: This is something I believe is very important to ensure a welcoming, safe and comfortable learning environment. For example, I try to be careful with the colour and contrast I use for my presentation and teaching material, to take into account colour blindness and difficulties using a screen. From my perspective as a non-native English speaker, I also try to use simple words and short sentences, so that international students can follow and understand.
- Seth: We champion community collaboration: This core value would affect the way I design curriculum. We are able to submit proposals for workshops; in this process this core value would lead me to seek feedback from the Carpentries community prior to finalizing my proposal, as more experienced instructors from around the world are an invaluable resource in optimizing the design of a course.
- Georgia: Always learning: I think I'd pay special attention to pre/post workshop surveys (and even mid-workshop surveys) to integrate feedback as I'm running the program. I'd want to make those surveys as accessible/anonymous as possible so that folks who are struggling are comforatble communicating that.
- Ron: Community collaboration: I would find collaborating with others very useful. I like that the classes are on github where anyone can make a pull request to suggest a change or addition to the curriculum.
- Farzana: Access for all, I may try to include live transcripts to facilitate access for non-native speakers. However, it will take substantial preparation with a scribe who can assist during the class. Making the pre-reading material available in multiple languages may be helpful for international learners. The electronic format is convenient for individuals with physical disabilities, however, having audio versions may be more useful for visually impaired participants, and individuals with disabilities like dyslexia. I would also allow extended breaks for particular students who may need the accommodation due to their physical disability or conditions like ADHD, where they might need additional time to focus and understand the material.
- Mark: Empower One Another - I like the idea of fostering an environment in which participants can exchange ideas and learn from each other as well as from the team of instructors. Designing the workshop in a way that allows for those kinds of activities, and allows for those sharing of ideas.
- Paula: Accessibility: If a person doesn't have acess to two monitors where it might be helpful to follow along, maybe provide printed materials beforehand?
- Revathy: Always learning: I would be very receptive about feedback and would definitely encourage any constructive criticism that comes my way. I would appreciate anybody being

uncomfortable of sharing their criticisms and would be willing to offer anonymity and take time to include and improve from all the feedbacks. I would also include some exercise where the learners can demonstrate how they would handle a session or topic.

Accessibility

Exercise: What Happens When Accessibility is an Issue?
Think of a time when you have been affected by, or noticed someone else being affected by barriers to accessibility. This may have been at a conference you attended where the elevator was out of service, or maybe a class you were taking relied on audio delivery of content. Describe what happened, how it impacted your (or someone else's) ability to be involved and what could have been done to provide better accessibility in this case.

- Inaccessible door that cannot be operated by an individual on a wheelchair without assistance
- The long lectures were only available on a video format without associated PowerPoint slides, that needed long processing hours to convert to images to facilitate notetaking
- International travel or study with electronics: The plugs are different most places so adaptors are needed so people can charge their equipment - if people haven't traveled before, they may not know this
- Hybrid meeting/conference situation where speaker is miked, but audience is not (not being able to hear questions being asked)
- Seating in many of my classes have been way to small for my body and sitting in class was quite painful most of the time.
- I have something akin to misophonia and it's very difficult for me to concentrate in groups in classrooms where there is a lot of ambient noise.
- Instructor assuming that all students in a grad level class already familiar with the course management software (Blackboard). This was not the case and caused those not familiar with it to be lost at the very beginning of the course, not being able to find the syllabus, calendar, etc. Eventually the instructor did a 'walk through' of where to find everything that helped students unfamiliar
- Seth: In a virtual TA session a classmate noted that they were color blind and could not differentiate the colors in a chart that was being displayed. It was a welcome reminder that color schemes used in slides and other materials should be chosen from palettes that have been vetted for accessibility to color blind people.
- Coding font/screen is way too small -- I have had this issue personally as a student, and I also had an older committee member emphasizing the importance of making font/screens as large as possible.
- I have chronic hearing issues myself, and sometimes I have difficulties to use a headset to follow an online course. Providing written material is important to help students in such situations. I also need a dark background as I work on computer over long periods of time, which is not always possible with certain software. Adding this option would be greatly helpful for users.
- Plots that are not sensitive to colorblind individuals, especially at a conference where this issue was mentioned in the presentation preparation guidelines. Some number of individuals were not

able to properly learn from certan plots and figures.
- the instructor assuming that all students are in the same timezone and asking the students to take the exam at the same time
- Not having an interactive screen/slides that describe the concept/topic and taking an online session. It becomes really hard to keep up with the pace, take notes and difficult to stay focused.

Systemic Exclusion

Stereotypes

- may be explicit (conscious and deliberate) or implicit (unconscious and automatic)
- guide what we notice about people
- guide how we interpret people's behaviors
- can facilitate quick judgements in appropriate situations (e.g. stopping a child from driving a car)
- can lead to systematically negative attitudes and behaviors towards members of certain groups

Code of Conduct: https://docs.carpentries.org/topic_folders/policies/code-of-conduct.html

Looking for More? Want to Contribute?

The Carpentries is actively working on improving our content and practices with respect to equity, inclusion, and accessibility. If you are interested in being involved in the development of this content, please let us know! Contributions to this page may be made on GitHub (click the "improve this page" link at the top), though our #accessibility channel on The Carpentries Slack, or by emailing team@carpentries.org.

Keypoints:

- Inclusivity is a key attribute of a positive learning environment.
- Universal design benefits everyone.

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Afternoon Break
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Teaching is a Skill

https://data-lessons.github.io/instructor-training/11-practice-teaching/index.html
Questions:

- How can I improve my teaching?

Objectives:

- Use peer-to-peer lesson practice to transform your instruction.
- Give thoughtful and useful feedback.
- Incorporate feedback into your teaching practices.

Exercise: Giving Feedback

We will start by observing some examples of teaching and providing some feedback.

Watch this example teaching video as a group and then give feedback on it. https://www.youtube.com/watch?v=-ApVt04rB4U Put your feedback in the Etherpad. Organize your feedback along two axes: positive vs. opportunities for growth (sometimes called “negative”) and content (what was said) vs. presentation (how it was said).

Note: there is a version of this video with subtitles in both Spanish and English here: https://www.youtube.com/watch?v=jxgMVwQamO0
Positive
- Content

- talking bout functions, which are important
- provides some worked examples
-
-
-

- Presentation

- He seems fairly interested in the topic and somewhat animated
- Live coding
- He did acknowledge a mistake he made ("my bad")
- The teacher seems to make efforts in explaning while typing
- The instructor seems to be thinking out loud and that way the learner can undestand his thought-process
- The audio is at a good level (for me) so they appear to be speaking loud enough
- For the most part, gave the impression that he enjoyed the content he was teaching

Growth opportunities
- Content

- Functions are discussed extensively but appear not to have been introduced
- Could better place the lesson in a larger context: why do we want to use functions in the first place?
- he started with "we were talking about functions before the break.." and moved to the new

concept directly. Adding more review about they've talked bout might be better.
- Seems like he was making the example up on-the-fly
- Needs to slow down
- Introduce the topic first, and learn about the stages of the learners
- Giving some contextualisation would make it easier for beginners to understand

- Presentation

- The words on the screen could be larger so that more learners can see them
- He is speaking very quickly and using quite a bit of jargon. Using a phrase like 'trust me' does not help students to learn how/why something works
- Took a fairly belligerent tone from the beginning ("sit down now")
- His back was to the audience at one point - I could still hear him, but that's usually not the case
- The instructor's pace was quite high and is hard to keep up with it, along with the fact that the font size on the screen was too small, it would be hard for the learners to follow
- Avoid using dismissive language like "this is so simple, anybody would know this"

it would be better if the teacher could avoid demotivating words/attitude, further simplify his explanations and make the flow of his talk better structured and easier to follow.
Reduction of the usage of words like "simple", phrases like "don't worry about this" without providing proper explanation
presentation was very fast-paced
the screen was not accessible, and will be difficult for students in the back to see, in these cases, magnifying the screen so the students can see what he's typing would be useful
Checked his phone at one point, giving the impression his mind was elsewhere

Exercise: Sharing Feedback

The prep time for this exercise is intentionally short – the point is to practice giving and receiving feedback, not to create a perfect presentation. Imperfect presentations will give you more to work with!

1. Individually, spend 5 minutes preparing a 90-second introduction to the topic of the lesson episode you chose before the start of the training course. You will not be live coding; you can use a whiteboard or other visual aids if available (but this is not required!).
2. Split into groups of three.
3. Get together with your group and have each person teach their segment to the group. Keep a strict time limit of 90 seconds per person (one person should be responsible for the timekeeping).
4. After each presentation, everyone gives feedback on themselves as well as on others.
5. After the first person finishes, rotate roles, and then rotate roles again.
6. Keep an eye on the time during feedback, especially if your group has more than 3 people, to be sure to leave time for everyone.
7. After everyone has given feedback on all of the videos, return to the main group and put everyone’s feedback about you into the Etherpad.

Positive
- Content

- use of good motivating example
- Good outline of introduction of material
-

- Presentation

- use of visual cues/highlighting
- Great speaking pace (slow but not sleepy)
- Good introduction connecting to the last speaker that way maintaining the flow
- Good pace
- humor
- Use of drawings/visual
- Good pacing, broad introduction, then going to she specifics

Growth opportunities
- Content

- emphasize how learners can use skill in real life
- Some use of jargon for a introduction of material
-

- Presentation

- larger font size
- speak slower
- VeryEye contact and vary intonation and not be monotonic

Exercise: Using Feedback

Look back at the feedback you received on your teaching. How do you feel about this feedback? Is it fair and reasonable? Do you agree with it?

Identify at least one specific change you will make to your teaching based on this feedback. Describe your change in the Etherpad.

- Very fair and accurate feedback: I need to better work on my voice and pitch. I think this is important as it influences how information is conveyed.
- Very fair and reasonable feedback -- in order to implement it, I would practice speaking slower and make sure to always ask if my font size is adequately large when sharing screen.
- I think my evaluators were very nice and were very generous :) I appreciated being told that humor was helpful. I sometimes make small jokes that I laugh to myself about, but I'm never sure if students really appreciate that.
- I think being more prepared can help to prevent confusing languages we use in a classroom

setting

- Very specific and accurate! It is helpful to know what is going well so you can ensure you continue to incorporate that element into future lessons
- Very fair and kind feedback. I would change the style of talking and reduce sentence lengths by reducing the amount of filler words I use.
- Some feed back that I got was to provide a goal for the unit to give students a bit of motivation to want to learn the info. I will definitely make sure to add this to lessons in the future. I think providing a goal would not only help with motivation but it would also help to frame the lesson for the student letting them know when they've achieved understanding of the concepts.
- i do agree with it, in future I would change the introduction to the lesson by trying to keep the 'fun' aspect of the introduction to the exercise but also emphasizing its utility, e.g. telling a story of a programmer writing a bunch of code without implementing a loop maybe
- Very useful feedback - I was provided with a suggested change that was supported by their experience
- all very fair feedback. To improve that, I would talk about the goal of the lesson first instead of going directly into what I'm going to teach; Also depending on the audience, explain some terms at the very beginning.
- I really appreciated the feedback. Will definitely keep the story telling approach to the material when relevant (I didn't even realize I was doing that), and remember to make sure I'm defining my terminology.

Keypoints:

- Like all other skills, good teaching requires practice and feedback.
- Lesson study is essential to transferring skills among teachers.
- Feedback is most effective when those involved share ground rules and expectations.

Wrap-Up and Homework for Tomorrow

https://data-lessons.github.io/instructor-training/12-homework/index.html
Questions:

- What have we learned today?
- What needs to be done to prepare for tomorrow?

Objectives:

- Describe overnight homework.
- Produce a paragraph, drawing, or diagram that summarizes what was taught today.

Exercise: Reflecting on the Day

Before we wrap up for the day, take 5 minutes to think over everything we covered today. On a piece of paper, write down something that captures what you want to remember about the day. The Trainers will not look at this - it is just for you.

If you do not know where to start, consider the following list for a starting point:

- draw a concept map, connecting the material
- draw pictures or a comic depicting one of the day's concepts
- write an outline of the topics we covered
- write a paragraph or "journal" entry about your experience of the training today
- write down one thing that struck you the most

This exercise should take about 10 minutes.

Keypoints:

- Today we learned about how people learn, how to build a positive classroom environment, and how to give feedback.
- Tomorrow we will cover specifics of Carpentries workshops and teaching practices.

Minute Feedback for the Afternoon of Day 1: https://forms.gle/sVGoguMgKLkVnnU49

August 17 - Day 2

Sign in: Name / Pronouns / Location / Institution / Email & Twitter (optional)
Please sign in so we can record your attendance.

- Kelly Barnes / She/Her / London, ON, Canada / The Carpentries / kbarnes@carpentries.org, @kbarne2
- Emily Bellis / She/her / Jonesboro, AR, US / Arkansas State University / ebellis@astate.edu, @em_bellis
- Yuncheng Duan / she/her /Durham, NC, US / Duke University / yuncheng.duan@duke.edu
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-
-
-

Introduction Question: What is your favorite emoji?

- the disco emoji
- smiling emoji with all teeth out :D
- cheers emoji and
- the rainbow + partyface combo
-
- dancing woman
- 🌍
-
-
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-
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Welcome Back

https://data-lessons.github.io/instructor-training/13-second-welcome/index.html
Questions:

- What have we learned so far?
- What will we focus on today?

Objectives:

- Review main points we discussed yesterday.
- Introduce topics we will discuss today.

Workshop schedule and break times
Today's break time(s):
AM Break - 10:25 - 10:40 EDT
Lunch - 12:30 - 1:30 PM EDT
PM Break - 3:25 - 3:40 EDT

Summary of Minute Feedback

- A guide for appropriate times for allotments of different tasks.
    - Sometimes curriculum has times. If not, trial and error or asking other people who have taught before.
    - If you are an expert, do not use the time it takes you to do the task. Maybe multiply it by 3 to estimate.
    - Ask for a checkmark when done (post-its in person), that way you can see when most are done.
- Efficient way to know the goal of your learners?
    - Probably the easiest is to just ask: pre surveys, discussions or polls at the beginning of a workshop.
    - If a group asks for a workshop, ask about the goals and experience.
- What is an episode?
    - An episode is one section of a lesson. I will demo this and we will talk more about it today.
- What are some examples of how we can remind learners of prior concepts?
    - Formative assessments (e.g., questions or exercises) that ask about prior concepts and then build on them.
    - Several lessons build on previous concepts, linking them, or contrasting easier ways. When appropriate, and with practice so you don't get lost, you can go back the relevant section in the etherpad and remind them that they did that work already.
- How to decide what assessment method to use?
    - There may be some useful tips in today's session on preparing to teach: https://data-lessons.github.io/instructor-training/18-preparation/index.html
    - Here are 56 more types of formative assessment: https://docs.google.com/presentation/d/1nzhdnyMQmio5lNT75ITB45rHyLISHEEHZlHTWJRqLmQ/pub?slide=id.p
    - take into consideration the different levels of learning and what the goal was of the section
- How to have students with different levels feel happy about the workshop? Or perhaps people should pre-select the students so that everyone is at a similar level.
    - 1. It's great if you can advertise in a way that everyone knows what to expect and you can hopefully get more people looking for novice level.
    - 2. If you have more experienced people, get them involved. Ask them to help other people.
    - 3. You can also have two levels of exercises: the basic one, and then a more challenging one. If someone finishes the basic one, they can try the harder one.
- Strategies for designing exercises and sessions that we can use going forward.
    - We will talk a little bit about reverse instructional design, learning objectives, and bloom's taxonomy today in this section: https://data-lessons.github.io/instructor-training/18-preparation/index.html
- Some examples of good teaching.
    - We will watch an example of good vs. bad teaching today.
    - Being a helper is a great opportunity to learn. You have the flexibility and mental space to watch what the instructor is doing and see how the learners do.
- Best practices for advertising and logistics of running a workshop
    - We will talk a bit about this today, but there is also lots of good information in the handbook: https://docs.carpentries.org/topic_folders/hosts_instructors/index.html. There are checklists for hosts, instructors, and helpers, as well as email templates, and other things.
- Are there more examples of inclusion?

    - Here are some examples of inclusive teaching strategies from the Yale Poorvu Center for Teaching and learning: https://poorvucenter.yale.edu/InclusiveTeachingStrategies
- How to manage expertise and awareness gaps?
    - You can catch up on what you might have missed on this section here: https://data-lessons.github.io/instructor-training/04-expertise/index.html
- How much leeway do instructors have to stick to or deviate from Carpentry lesson? e.g. if you want to address points from the minute cards, when do you do that when the recommended schedule already quite full?
    - This depends on a few things, but largely, there is always going to be more information than you can cover. Deciding what you want to cut is part of preparing Carpentries curriculua.
    - Knowing a bit about the learners and their goals can guide you too. Know the lesson well and identify points that you might add to because they have interest and you, or another instructor, know the material. Be careful if skipping since some lessons build on previous steps.

Exercise: Questions

Yesterday we asked you to read some resources about the logistics of teaching and running Carpentries workshops. Please add your questions about logistics and preparation to the Etherpad. We will answer these questions in the Etherpad during your work time and will return to this list later today.

- Emily: I think I read something about 'badges' for different lessons for instructors... is there any more info about this? Other places I read that carpentries considers a certified instructor qualified to teach any lesson
    - Once certified, you can teach any Data, Library, or Software Carpentry lesson
- Farzana: None right now
- Georgia:The first carpentry workshop I attended was in person, but I helped at a Zoom-based workshop -- have there been any success stories in running a hybrid version of this workshop?
    - Not yet, but we do have some people experimenting wtih this and hopefully we can get them to write a blog post on how it goes.
- Mark: How are the lessons assessed over time? Feedback from instructors and students, formal review session of the lesson itself?
    - Community collaboration
    - We are restarting the Curriculum Advisors program
    - Reviewing pre and post survey data
- Nezha: When online, should the Carpentries workshop be recorded for later access?
    - This will depend on the privacy policies at your institution. You will also need everyone's consent to record.
- Paula: Is it allowed to have a certified teacher teach a software carpentry lesson that is in a workshop that is not a software carpentry workshop (ie it is part of a larger workshop)?
- Rachel:
- Ronald:
- Seth: How frequently do instructors teach workshops without helpers, and if/when this happens, how do you recommend working through technical issues that individuals are having without getting off track in working through the material and ensuring all participants have a good experience?
- Yotam:

- Yuncheng: Are all carpentries workshops supposed to use the carpentries curriculum? Can we design our own curriculum and discuss with the carpentries experts?
- Revathy:

This activity should take about 5 minutes.

Keypoints:

- Instructors guide learners to construct the proper big picture (accurate mental model) of the topic rather than focus on details.
- Instructors rely on frequent feedback from learners to monitor their own presentation of the material.
- Instructors introduce a few concepts at a time to avoid cognitive overload.
- The best way to motivate learners? Show them how to do something they can immediately put to use and be enthusiastic about it.
- Teaching is a learned skill.

Checkout Process

https://data-lessons.github.io/instructor-training/14-checkout/index.html
Questions:

- What do I need to do to finish certifying as a Carpentries Instructor?

Objectives:

- Describe the final steps required to qualify as an Instructor.
- Schedule your community discussion session.

Exercise: Schedule a Discussion or Demo
Visit the discussion Etherpad to sign up for a session: https://pad.carpentries.org/community-discussions
If the session you would like to attend is full, contact the discussion host and co-host to ask if you can attend.

If you would prefer to do your teaching demonstration before your discussion, visit the demo Etherpad and sign up there: https://pad.carpentries.org/teaching-demos

This exercise should take 5 minutes.

Keypoints:

- To certify, you must contribute to a lesson, take part in a discussion, and do a teaching demo within 90 days of your training event.

The Carpentries: How We Operate

https://data-lessons.github.io/instructor-training/15-carpentries/index.html
Questions:

- How is The Carpentries organized and run?
- What is the difference between SWC, DC, and LC workshops?
- How do you run a Carpentries workshop?

Objectives:

- Get connected with The Carpentries community.
- Describe where you can go to get information on running a workshop.

A Brief History

Global & Local Carpentries communities

Image: A very brief history of The Carpentries. A timeline. https://data-lessons.github.io/instructor-training/fig/SWCDChistory.png

Similarities and Differences between The Carpentries Lesson Programs

Similarities between Data Carpentry, Library Carpentry, and Software Carpentry workshops include:

- a focus on technical skills,
- a two-day format taught by volunteer instructors, and
- a focus on filling gaps in current training for learners.

Image: Three intersecting circles labelled Software Carpentry, Data Carpentry, and Library Carpentry. https://data-lessons.github.io/instructor-training/fig/carpentries-venn-diagram_20200904.svg

What is a Carpentries Workshop? The Rules.

Using the Names and Logos
https://carpentries.org/workshops/#workshop-core

Recruiting helpers:
https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#helper-checklist

Materials
https://carpentries.github.io/instructor-training/LICENSE.html

Reporting a ‘Mix and Match’ Workshop
https://amy.carpentries.org/forms/workshop/

Instructor Certification is Comprehensive

Carpentries Jargon Review
Exercise: Test yourself!
As a class or in groups, see how many of the following terms you can define.

- Lesson
- Episode
- Workshop
- Lesson Program
- Instructor
- (Instructor) Trainer

This should take about 5 minutes.

How to Organise a Carpentries Workshop Locally

https://carpentries.org/workshops/#workshop-organising

The Carpentries Handbook: https://docs.carpentries.org/ includes:

- templates and checklists https://docs.carpentries.org/topic_folders/hosts_instructors/index.html
- policies https://docs.carpentries.org/topic_folders/policies/index.html
- much more!

Callout: Teaching Opportunities: Local and Global
Instructors mailing list: https://carpentries.topicbox.com/groups/instructors

Setting Out On Your Own… Together: Lesson Incubation
https://github.com/carpentries-incubator/proposals/

A Culture of Contribution

Exercise: Community Roles
Select one role from the list below that interests you. Using the the descriptions on The Carpentries community website, write 1) a short definition of the role and 2) a question that you have (or that you imagine someone else might have) about the role. Are there roles you would like to see that are not listed? Note that, too!

https://carpentries.org/community/

1. Executive Council
2. Mentors
3. Instructor Trainers

4. Lesson Developers
5. Code of Conduct Committee
6. Instructor Development Committee
7. Community Facilitators
8. Maintainers

- Emily: Executive Council - 9 member council (4 elected by community, 5 appointed by itself) is the highest leadership body of the Carpentries. Are there any term limits to serving on the EC?
- Farzana: Mentors: A mentor's role is to support the instructors. This support is provided in many forms, including teaching preparation, launching new workshops, or lesson development. Do you have to be a certified instructor to be a mentor? What other requirements are there to be a mentor for the Carpentries?
- Georgia: Instructor Trainers Experienced instructors who are responsible for training new instructors. They also maintain the training curriculum. Q: How much experience should one have before becoming an instructor trainer?
- Mark: Lesson Developers Individuals or teams that create new lessons. Question: Is a lesson in the incubator ever "done," or the idea is that it is always under development?
- Nezha: Code of Conduct CommitteeThe role of the code of conduct committee is to maintan a welcoming, friendly and safe environment for all participants. Question: how to best deal with participants having a behaviour in violation with the code of conduct?
- Paula: InstructorDevelopment Committee: Fosters learning and community among instructors by creating space for instructors to share and discuss their experience and strategies as instructors
- Rachel: Community Facilitators
- Ronald: Maintainers Supports existing lessons by managing pull requests and issues. Question:
- Seth: **The Executive Council** is the highest leadership body of The Carpentries and is composed of nine members, four of whom are elected by the community and five of whom are selected by the Council. They appoint an Executive Director who then reports back to the Council. They regularly meet for strategic and organisational planning, providing financial oversight, identifying revenue streams and resource development, approving and monitoring The Carpentries programs and services, and enhancing The Carpentries public image.
- Yotam: Mentors: Must be a certified carpentry instructor who has taught at least three workshops in order to apply to become a mentor. Mentors are experienced trainers who guide small groups of less experienced trainers toward a particular outcome. Outcomes vary based on the needs/wants of the mentees of a particular mentoring session.
- Yuncheng: Instructor Trainers: experienced instructors who train the new instructors and get them prepared; Q: What are the prerequisites for experienced instructors to become instructor trainers?
- Revathy: Lesson Developers: Community members who are actively involved in developing new content in a carpentry-style way. Q: How are the carpentry lessons selected if the carpentry incubators lessons are not endorsed?

This exercise should take about 5 minutes.

Keeping In Touch

Want to listen?

- Sign up for our newsletter
- Follow us on Twitter, Facebook, or LinkedIn

Want to interact (or listen with options to engage)?

- Join our Slack organisation
- Join our Email lists (start with “Discuss”!)

Want to join meetings (to meet new people or listen in)?

- Sign up for Community Discussions (or just drop in if there is space!) or other events when announced
- Explore taking on one of the Roles identified above

Exercise: Get Connected

Take a couple of minutes to sign up for The Carpentries channels you want to stay involved with on this page:
https://carpentries.org/connect/

This exercise should take about 5 minutes.

Keypoints:
The Carpentries materials are all openly licensed, but names and logos are trademarked.
Carpentries workshops must cover core concepts, have at least one certified Instructor, and use our pre- and post-workshop surveys.
[Guidance for teaching and hosting workshops]
(https://docs.carpentries.org/topic_folders/hosts_instructors/index.html) is provided in [The Carpentries Handbook](https://docs.carpentries.org).

Live Coding is a Skill

https://data-lessons.github.io/instructor-training/17-live/index.html
Questions:

- Why do we teach programming using participatory live coding?

Objectives:

- Explain the advantages and limitations of participatory live coding.
- Summarize the key dos and do nots of participatory live coding.
- Demonstrate participatory live coding.

Why Participatory Live Coding?

Exercise: Up and Down
List some advantages and challenges of participatory live coding from both a learner’s and an instructor’s point of view in the Etherpad.

- Emily:
- Farzana:
- Georgia:
- Mark:
- Nezha:
- Paula:
- Rachel:
- Ronald:
- Seth:
- Yotam:
- Yuncheng:
- Revathy:

This discussion should take about 5 minutes.

Exercise: Compare and Contrast
Watch this first participatory live coding demo video: https://youtu.be/bXxBeNkKmJE and this second demo video: https://youtu.be/SkPmwe_WjeY as a group and then summarize your feedback on both in the Etherpad. Use the 2x2 rubric for feedback we discussed earlier.

- Emily:
    - Positive content
    - Positive presentation
    - Improve content
    - Improve presentation I wonder about doing this in a script rather than interactively so that participants can see the formatting of the loop more easily. He was also not consistent with the formatting (line by line vs. using semicolons to separate)
    - Positive content: talks through loop concept and each part of code individually
    - Positive presentation: responsive to students e.g. with sticky note
    - Improve content
    - Improve presentation: slow down even more
- Farzana:
    - Positive content: Clearly explained;
    - Positive presentation: The content is clearly visible on the screen with colored codes; more animated, engaging
    - Improve content: Add comments
    - Improve presentation: Make eye contact with the students to see if they' re following and connect with the students; give students opportunity for Qs
- Georgia:
    - Positive content: Video 1: The coding screen was a bit easier to see (at least compared to what we saw yesterday). Video 2: Takes a moment to pause and explain important aspects of what is happening in the code, walked through the error
    - Positive presentation: Video 1: Ummmm he seemed nice? Video 2:Is doing a great job of speaking through the code, is working at a good pace
    - Improve content: Video 1: He could take a moment to explain why things might be going wrong when there is an error. Video 2: He could take a moment to ask students what they expect before hitting enter, so then students can evaluate whether they are understanding what is going on.
    - Improve presentation: Video 1: It would be good for the presenter to talk through the

coding and his thought process. It is wayyyyy too fast. Video 2: I think it would be good to involve the class a bit more -- have an opportunity for students to answer a question or two

- Mark:
    - Positive contentVideo 2: Explains error well
    - Positive presentation Video 2: More dynamic - standing, point to screen, made effort to keep facing front or at least in profile while pointing at the screen. Checked in with student at the beginning about red sticky note
    - Improve content
    - Improve presentation: He didn't provide much explanation of what he was doing.Video 2: Walking in front of screen can be distracting - use laser pointer instead?

- Nezha:
    - Positive content
    - Positive presentation: 1) the pacing is good
    - 2) The teacher uses a white background, with very readable font size
    - more dynamic and interactive presentation. He is standing and going to the screen to explain the element. We better follow the logic of his coding.
    - Improve content
    - Improve presentation: It would be better if the intructor talked while typing so the learners understand and better follow what he is doing.
- Paula:
    - Positive content several examples of whatever he was doing
    - Positive presentation probably big enough font? hopefully had asked.
    - Improve content explain why doing certain things
    - Improve presentation: easier for students if they talked through typing, slightly fast speaking
    - Positive content explained in detailed what the code is doing, explained his error in detail, spoke in a non-monotone voice (so much appreciated)
    - Positive presentation spoke while typing
    - Improve content
    - Improve presentation:
- Rachel:
    - Positive content
    - Positive presentation
    - Improve content
    - Improve presentation
- Ronald:
    - Positive content Shows that the variable can be whatever the students want, also shows an alternate form of doing the exercise as a one-liner
    - Positive presentationInteracts with his code to explain what each line is doing. Better pace.
    - Improve content
    - Improve presentation
- Seth:
    - Positive content The content was well-organized and useful
    - Positive presentation The display was clearly visible and well-organized
    - Improve content Perhaps it would be best to include specific call-outs in the curriculum for the presenter to take breaks to assess understanding
    - Improve presentation Talk through issues as they arise; when an error message comes up,

explain how to get through it
        - Round 2: Positive
            - content: does a great job of setting the scene and making sure the learners have a roadmap for where they are going
            - presentation: active engagement with the material, physically pointing at different parts of the output to explain what is going on and making eye contact which should help him assess understanding
        - Round 3: Improve
            - content: may be useful to briefly stop and ask 'what questions do you have?' as he covers a lot without assessing comprehension
            - presentation: perhaps a bit fast
- Yotam:
    - Positive content: Loops are important.
    - Positive presentation:
    - Improve content:
    - Improve presentation: Didn't explain the commands as he was typing them. Didn't explain the error.
    - Positive content: Loops are important. Explaining multi-line commands.
    - Positive presentation: Explaining every part of the command he's typing. Explaining what the commands do.
    - Improve content:
    - Improve presentation:
- Yuncheng:
    - Positive content
    - Positive presentation
    - Improve content: didn't explain the for loop logistic
    - Improve presentation: might be better if he could talk the codes he typed
- Revathy: (second video)
    - Positive content: is explains the working of the loop
    - Positive presentation: more interactive than first video, making eye contact with the learners; is explaining the error and the work around
    - Improve content: use of dismissive content "trust me i've been there"
    - Improve presentation

In the videos, the bash shell for loop is taught, and it is assumed learners are familiar with how to use a variable, the head command and the content of the basilisk.dat unicorn.dat files.

Note: Sometime sounds in the room can be poor. Turning on closed captioning by pressing the cc button will improve the accessibility of these videos.

This exercise and discussion should take about 15 minutes.

Top Ten Tips for Participatory Live Coding in a Workshop

1. Stand up and move around the room if possible. This makes the experience more interactive and less monotonous. Use a microphone if one is available to make it easier for people with hearing difficulties to hear you.
2. Go slowly.

3. Mirror your learner's environment.
4. Use your screen wisely.
5. Use illustrations
6. Turn off notifications
7. Stick to the lesson material.
8. Leave no learner behind.
9. Embrace mistakes.
10. Have fun!

Exercise: Practice Teaching - BREAKOUT ROOMS (Groups of 3, Write down/screenshot names)

1. Split into groups of three.
2. Assign roles, which will rotate: presenter, timekeeper, note-taker.
3. Have each group member teach 3 minutes of your chosen lesson episode using live coding. For this exercise, your peers will not "code-along." Before you begin, briefly describe what you will be teaching and what has been learned previously. Do not record this exercise.
4. After each person finishes, each group member should share feedback (starting with themselves) using the same 2x2 rubric as yesterday. The timekeeper should keep feedback discussion to about 1 minute per person; this may leave some time at the end for general discussion. The note-taker should record feedback in the Etherpad.
5. Trade off roles.

This exercise should take about 25 minutes.

Room 1: Emily, Nezha, Yotam

- Demo 1:
    - Positive: Good volume, good pacing, good font size, good colorscheme.
    - Improvements: Possibly explain the (intended) error.
- Demo 2:
    - Positive: volume, pace good, font size good; IDE set up well; explained all elements of lesson
    - Improvements: has c() been covered? some typos
- Demo 3
    - Positive: very well explained, good font size
    - Negative: a little bit fast

Room 2 Revathy, Farzana, Mark

- Demo 1: Clear and easy to understand; good pace, good explanations; make sure font size is easy to see; good at setting context, and making clear where lesson is going; good energy
- Demo 2: Pace was good, easy to understand; liked explanation of the enivironment -good set up of context; one tab was open
- Demo 3: Great intro, shared usefulness of the topic, font made larger, shared how the student's environment may be different, explains w/ analogy and humor; explaination of content and setting up context, assuring the learner that mistakes are normal

Room 3 Ron and Georgia

- Demo 1: Did a good job explaining a syntax difference clearly and without getting too off topic, good job previewing and truncating the output. Could slow down a bit!
- Demo 2: Great review of what was learned earlier (with a demo), good job of providing

motivation for learning the topic, review of what was learned at the end was also helpful. Could slow down a little bit and more clearly state what 'ls' 'cd' etc. stand for so that it makes it a bit easier for people to remember all the new functions.

Room 4 - Paula, Yuncheng, Seth

- Demo 1 - Download file from url
    - Very clear outline given at the outset, great that you checked in with users to ensure that they had completed previous necessary steps, great that you made note of what users should be seeing
- Demo 2 - Pace was good (not too fast)
    - a very good interaction with the learners and frequent checking in with the learners about their progress.
    - provided some external resources for the learners
    - while talking about the fields/columns, perhaps showing the columns at the same time

Keypoints:

- Live coding forces the instructor to slow down.
- Coding-along gives learners continuous practice and feedback.
- Mistakes made during participatory live coding are valuable learning opportunities.

Preparing to Teach

https://data-lessons.github.io/instructo-training/18-preparation/index.html
Questions:

- How should I prepare to teach?

Objectives:

- Create a profile for a learner in your workshop.
- Critically analyze a learning objective for your workshop.
- Identify checkpoints in a lesson for formative assessment.

Building Teaching Skill

Over-preparing on technical content can be tempting. Don't forget to prepare to teach!

Image: A tree diagram of Carpentries instruction and audience in which Instructor Trainers teach Instructors and Instructors teach Learners https://data-lessons.github.io/instructor-training/fig/instructor-training-program.png

More Practice Live Coding

https://data-lessons.github.io/instructor-training/20-performance/index.html
Questions:

- How did you change your teaching in response to feedback?

Objectives:

- Use feedback to improve your teaching.

Exercise: Round Two

1. Before splitting into groups, read the rubric that is given to Instructor Trainers as a suggested framework for evaluating the online teaching demonstration sessions that are part of Instructor checkout. https://data-lessons.github.io/instructor-training/demos_rubric/

What questions do you have?
2. Return to your groups of 3 and repeat the previous exercise. This time, the presenter should incorporate changes based on feedback received, and everyone should try to 'level up' their feedback using the rubric for teaching demos.
3. When you are finished, add some thoughts on this process to the Etherpad: What did you change? Did it work better or worse with the change? How might you do it if you were to teach it again?

Room 1: Yotam, Emily, Nezha
Demo 1:

- Positive content: shows the utility, new content presented
- Negative content:
- Positive delivery; appropriate pacing, explains in detail as typing
- Negative delivery

Demo 2:

- Positive content: shows the pitfalls, new content presented
- Negative content
- Positive delivery: good flow, explains in detail as typing
- Negative delivery

Demo 3:

- Positive content
- Negative content
- Positive delivery: tried to identify and solve issue when not getting expected output
- Negative delivery

Room2: Farzana, Mark, Revathy
Demo1: Detailed explanations of commands and how to use them, asking feedback in between ensuring learners are able to follow (about cursor being visible), great way of explaining the error and what correction needs to be done
Demo2: Good analogies, connecting with math, explain the variations that can be done with the function, keeping in mind different versions of the software and letting the learners know there might be variations, good tonal variations and pace is well done.

Demo 3: Covered so much material in such a short time - very well paced; good use of questions to demarcate breaks in the material and invite audience perspective

Room 3: Ron and Georgia
Demo 1: Gave a great example of why we would want to use certain functions/flags, pacing was excellent. Improve: Could give a couple more concrete examples of why we might want to change working directory, for example. There were a lot of new functions that were introduced, so it would be good to take a brief pause to review a couple of them or have students apply them (5 minutes felt about the limit of how many things I could hold in my working memory :)).
Demo2: Pacing was much better, appreciated interaction with student ("what do you expect will happen"), manufactured error was helpful. Improve: used a little bit of jargon when explaining an error, the R output environment is a bit disorienting for newbies, so it would be useful to pause and highlight the output
Room4: Yuncheng, Seth, Paula
Demo1: Content [Functions]: Issue first then bring up formula, interactive with the audience, presentation: felt natural interaction with people, use good example while explaining exactly what you're doing,
Demo2: Good pace, several examples to show how to do something many ways
Demo3: good pace and also it's very nice to remind the learners what they've learned last time. Very good explanation on the differences between two functions

Keypoints:

- (Reflective) Practice makes perfect.

Working With Your Team

https://data-lessons.github.io/instructor-training/21-management/index.html
Questions:

- What are the challenges of managing a heterogeneous classroom?
- What should we do if there is a Code of Conduct violation?
- What does it mean to be a co-Instructor?
- How does an instructional team prepare for a workshop?

Objectives:

- Identify potential challenges of teaching learners with very different backgrounds and skill levels.
- Locate resources to direct your response if someone at your workshop violates the Code of Conduct.
- Identify workshop roles and responsibilities for your team.
- Use The Carpentries workshop website template instructions to start creating a website.

Never Teach Alone

The Instructional Team

- A Host who organizes the workshop logistics
- Two or more Instructors who plan and execute workshop instruction
- Helpers who support learners during the workshop

Hosting
https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#host-checklist

Helpers

- help learners with setup and installation
- answer questions during exercises
- monitor the room to spot people who may need help (indicated by a sticky note or otherwise)
- monitor the shared notes and either answer questions there or remind the Instructor to do so during breaks

https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.html#helper-checklist

Carpentries Classroom Practices

- Starting with the Code of Conduct
- Participatory Instruction & Hands-off Help
    - Learners Use Their Own Machines
- Sticky Notes
    - Accessibility of Sticky Notes
- Formative Assessment
- Breaks (ideally with snacks)
- Feedback

Sticky Situations 1: Learners at Many Levels

Exercise: What Are the Challenges?
What are some of the challenges you might expect when teaching learners with a broad range of expertise? Add your thoughts in the Etherpad.

- pace of course is too slow for some and too fast for others.
- Maybe 1 or 2 learners are way behind the rest of the class, and don't prepare as directed, we may

still have to find ways to accommodate them
-
- Some learners may have off-topic/more advanced suggestions that can overwhelm other learners
- At either end of the spectrum - group with a large segment that needs a lot of extra help, or one with a large segment of advanced learners - there's a danger of throwing off the rhythm of the entire class to the point where no one is really learning. To the extent possible, it's good to know the bakground of the group ahead of time. Or have additional exercises/readings/videos that can be provided to either group (either in the moment or for after the workshop is done).
- Advanced learners may have developed to bad habits along the way that will make your instruction counterintuitive to them.
- Some learners will need more support than others and may ask a lot of questions and thus require more time to spend with them than others. The instructor may need to find a balance to be able to go forward in the course content. Making it clear that learners can ask questions after the session in feedback survey could be helpful. Also, adding advanced exercises as option for advanced learners.
- Learners are learning at different paces
- novice might not want ask questions if they notice that there are some advanced classmates
- How much detail to go into about the topic may be unclear
- In a room with learners with various levels of expertise and understanding, it is difficult to find the middle ground. we need to careful that we don't get in too much deep in to the topic and overwhelm those learners with less expertise/experience and vice-versa keep things very basic which could bore the people with more expertise. In such scenarios, I feel it can be a good exercise to group learners of different levels in a team and make them do tasks together, that way facilitating the concept of learning and advancing from your peers.
- There is the potential for an individual student or a small group of student to derail the lesson if they are experiencing a technical issue and are not able to resolve it (can be mitigated by having a helper jump in and help)

Sticky Situations 2: Code of Conduct Violations

Exercise: Know Your Resources
1) Take 5 minutes to read through the Code of Conduct Incident Response Guidelines:
https://docs.carpentries.org/topic_folders/policies/incident-response.html
2) Discuss what you have read in small groups. As questions arise, you may wish to refer to our complete Code of Conduct section in The Carpentries Handbook:
https://docs.carpentries.org/topic_folders/policies/index_coc.html

- What would you want to discuss or have your instructional team agree upon in advance of your workshop?
- What questions do you have about CoC enforcement?

3) Write some notes in the Etherpad.

- Room 1: Yotam/Paula/Farzana: signal for break; have a private group chat for the

instructors/helpers set up ahead of time to be used if necessary; Call the authorities: chain of command

- room2: It's good to know that there's CoC existing so that the instuctors can follow those instructions. Not sure if there's any example of indicents and solutions that we can learn from?
- Room3: Ron/Revathy: Wondering what would be the steps to take/follow in case there is a strong disagreement between learners in the group or there is a clash in opinions. Is this something that comes under the umbrella of the code of conduct?
- Room 4: It is important to inform the participants about how to report a code of conduct incident, both in the invitation email and at the beginning of the workshop.
-

Planning Together

Exercise: Teaching Together - Nuts and Bolts
With a partner, imagine that you are planning a workshop together. For this exercise, you may assume that your workshop has a separate, designated Host.

- How would you prepare to teach a workshop together?
- How would you coordinate with other members of your instructional team (e.g. Host, Helpers)?
- What kinds of things will you do to support each other during the workshop? What won't you do?

Record some notes, and share your thoughts with the group. This exercise should take about 10 minutes.

Room 1: Revathy/ Georgia/Farzana:

- Switch up instructors w/n the day b/w the roles of instructor/helper
- Pre-meeting among helpers/instructors about their strenghts and weaknesses to facilitate task assignment
- Check in the beginning/end of the workshop to make sure everything is in order and review previous feedback
- Be specific re: distribution of duties
- Troubleshoot issues in break-out room
- Coordination w/ Google doc/ Meet/ chat/ slack channel/ other preferred platforms in the background among helpers --> review history before next session
- Be careful about not to interrupt the instructor, but help them in a constructive manner to not affect their credibility

- Room 4:
    - consult checklist https://docs.carpentries.org/topic_folders/hosts_instructors/hosts_instructors_checklist.htm

l#instructor-checklist
- decide how to work with helpers
- what kind of workshop to teach (centralized vs. self-organized)
- plan a time to practice
- general instructional strategies (using stickies, etc.)
- curriculum included
- Following pandemic, will it still be possible to teach an official carpentries workshop in online format?
- prepare plan for code of conduct/safety violations both Carpentries and host-institution specific
- sign-up for community discussion for any questions pre-workshop or post-workshop debriefing
- decide on size of workshop? whether to charge?

Room 2/ Mark, Paula, Yotam, Nezha:
- coordinate with the group ahead of time
- make sure the instructors and helpers are on the same page about the content that will be taught and if anything will be added or omitted
- distribute all materials among the instructional staff
- decide how to resolve conflicts and handle any possible code of conduct violations
- important to talk about how things will be taught and who will do what; limitations and scope of each instructional staff member

Keypoints:

- Team work takes work, but allows you to share the load and build connections.
- Working with a broad range of learners can be challenging, but there are many ways to keep a classroom happy and motivated.
- The instructional team decides how to respond to Code-of-Conduct incidents during a workshop; all violations should be reported to The Carpentries Code of Conduct committee for follow-up.

BREAK - Come back at 3:55pm Eastern Time

Launches and Landings

https://data-lessons.github.io/instructor-training/23-introductions/index.html
Questions:

- How do you actually start a workshop?

Objectives:

- Connect goals of an introduction with options for content and delivery.
- Practice a short introduction.
- Identify worthwhile elements of a workshop conclusion.

Launching your Workshop: The Introduction

"primacy effect": a tendency to remember things presented at the beginning of a list or event

Exercise: What is in an Introduction?
Get into small groups (3-4 people) and discuss the questions below. Take notes on your answers in the Etherpad.

1. What do you hope to accomplish in a workshop introduction?
    - Room 1 (Georgia, Yotam, Seth): Introductions that stand out are those that lead with an outcome that is exciting and then goes on to outline a roadmap to how you will get there during the session. Setting a positive and welcoming tone is important.
    - Room 4: Yuncheng/Farzana:
        - Know about learner's expectations and goals,
        - Make learners comfortable communicating w/ the instructor/peers
        - Make sure they know the schedule/technical requirements
    - Room 3: Introduce the instructor and helper, the course objectives, present the tools to use, clarify the code of conduct, and check expectations of the students
    -
    - Room 2: overview (big picture/ rough schedule), norms like sticky notes, code of conduct, introduce instructors and helpers, examples from disciplines (in this field, you would use these tools) (and keep making references to the individual research interests throughout), have participants introduce themselves/icebreaker
    -
2. What information do you need to include in an introduction to accomplish these goals?
    - Room 1 (Georgia, Yotam, Seth): To accomplish what we've outlined above, it is necessary to 1) provide an overview of what will be covered in each section, 2) ensure that learners have the resources they need, and 3) set expectations of the learners, including behavior/conduct expectations and participation
    - Room 4: Yuncheng/Farzana:
        - Overview of topics to cover during the workshop
        - Icebreakers
        - Comprehensive info on the curriculum/syllabus
    - Room 2: presurvey to get information about participants
    - Room 3: Give quick overviews of how the workshop is structured in terms of topics covered and how it can be useful to them. This could be done by asking the learners to jot down their expectations and check in with them at the end to see if they met the expectations.

Learning Objectives For your Introduction

After the introduction learners should:

- be able to predict the type of instruction
- know what will be taught
- understand what will be required of them
- believe that they can learn from the workshop

The instructional team should:

- know of who is participating in the workshop and what their expectations are
- have an initial impression of how learners respond to participation prompts and what will be needed to encourage them to engage

Exercise: Practice Your Introduction

Imagine you have completed instructor training and you are about to teach a full lesson around the material you have been practicing teaching today.

1) Write out some notes, covering a few of the topics described above:

- Introduce yourself effectively
- Clarify learning objectives and expectations
- Set the tone for the workshop

2) Return to your groups of 2 or 3 and each give 2 minutes of your introduction. (5-6 min)
3) After each introduction, briefly share feedback, reserving extensive discussion for after all have had a turn to present.

Room 1: Emily Yotam Nezha
1) We think it is important to briefly introduce the backgroud of the instructor to see the career options where these skills are applied. Present Carpentries community. Be friendly, make sure that the particiapnts feel comfortable.

Room 2: Mark/ Revathy/ Farzana:

- Intro w/ instructor's length of experience teaching the material
- Connecting current material w/ previous topics already covered

The Art of a Smooth Landing

Exercise: Brainstorm: Making the Last Moments Count

You have made it to the end of your workshop! Everyone is exhausted and their brains are full. You could cover more content… or you could use the last few minutes in another way.

In the etherpad, write down one thing you could do at the end of a workshop. What is the value of spending time on that thing? If you have time after writing down your idea, read through the others in the etherpad. If you have another idea that has not been written down yet, add it to the list.

- Emily: have learners create a concept map of all the topics covered. That helps take a step back from everything and return to the big picture view, it also is something they can come back to later for reference
- Ron: I would leave time for students to fill out the post-attendee survey. I'd also summarize what the course covered. And it might be nice to have some resources for students going forward so that they can continue their education on the topic.
- Nezha: Interactive Multiple Choice Quizz, possibly in teams, to review some of the concepts. Finishing on something fun that stimulates learners attention is efficient for memorisation.
- Seth: I would do a quick recap of all that had been covered and ask if, at that, point, anyone had any questions. I find that when professors do this in my courses it reminds me what I should come away understanding; hearing something in the recap that I didn't understand (along with an open environment for sharing) would prompt me to ask clarifying questions.
- Yuncheng: summarzing what we've covered; showing the learners how to save the codes and files for future referece; Listing a couple of things (advanced tools/algorithm) they might be interested in and sharing the resources; collecting feedback and answering questions
- Georgia: Something fun(!) related to a topic we've covered. If I was teaching something with a lot of plotting, I might organize a show/tell of fun plots. I feel like at the end of a workshop, folks are very tired and the energy is lagging, so I want to leave everyone with something memorable/positive.
- Revathy: Present something like a cheatsheet which quickly summarizes everything that was covered and end it with an activity or a fun session that allows for feedback, suggestions and networking
- Paula: They could do the post-workshop survey and I would give them the links for more resources related to the topic we covered in the workshop
- Farzana: What their next steps are in regards to what they have learned, share contact info and resources for staying connected, or for follow-up as needed
    - This will help them have a roadmap of what to do next to apply the lessons they have learned effectively and put in to practical use
- Mark: Something either fun or inspiring that ends things on a high note. A story that puts it all together and answers the "so what?" question - why did we just do what we did.
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