Do you feel well trained to effectively train others? Many of us end up in roles where we are required to mentor, teach, train and manage others with little to no professional training on how to do so efficiently, effectively and meaningfully. This session is dedicated to distilling a lot of teaching and learning science into a handful of strategies that can help you improve the success of your user training sessions, informed by evidence-based pedagogical strategies used in higher education STEM classrooms. Strategies include effective communication, content structure and delivery, practice, assessment, and feedback.



Strategies for successful user training sessions: A Teaching Professor Perspective

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What is a Teaching Professor?

And, why might their perspective be helpful here?

A tenure-track faculty line at the University of California committed largely to teaching, in the vein of transforming undergraduate [STEM] education (e.g. directly in their classrooms and through developing curriculum, and indirectly by positively impacting their faculty colleagues). - Harlow, A. et al. PLoS One (2020) We blend disciplinary expertise with training and experience in pedagogy and teaching to support meaningful learning and student success.

We do this in many ways at many levels, including:

- Course/curriculum design and development using evidence-based teaching and learning strategies.
- Data driven approach to measuring impact, learning and success.
- Facilitating faculty development in teaching and mentoring.
- Collaborative and interdisciplinary pedagogy that drives culture change.

You are teaching people in your professional roles, and just like me and my colleagues, you're probably interested in learning ways to do so that are more effective and successful!

30-second reflection:

What is your biggest challenge with effective user training?

Giulia, how can I make my training sessions better?



Ben Abrams Ph.D. Director, UCSC Life Sciences Microscopy Center

Strategies for successful user training sessions

- 1. Effective Communication
- 2. Effective Structure and Delivery
- 3. Opportunities for Practice
- 4. Assessment and feedback

Could any of your specific challenges be addressed by one or more of these strategies?

Effective Communication

Challenge: Diverse audience with varied backgrounds, knowledge, experience and learning styles- how do you deliver training to meet everyone's needs?

What does teaching and learning science tell us? Accessibility and inclusivity are important, and the way you communicate sets the tone of the learning environment!

- Speak to *everyone* avoid jargon, define terms, and explain how things work or why they're important
- Provide visual aids, use bullets, record content, and be mindful of **cognitive overload**
- Consider different learning styles, expectations and motivations
- Provide session agendas
- Give clear instructions
- Communicate goals/outcomes
- Set explicit expectations

Example first-line communication (email)

Thank you for your interest in microscopy training. Here is our workflow:

1. If you have not done so already, please follow the link in my signature below to submit a **training request form**. This is very helpful to me in understanding your specific goals and needs, and for tracking user projects.

2. Once I receive the form I will contact you with questions (1-3 business days), and to schedule a training session. You should plan for ~ 2 hours of asynchronous training, and ~2 hours for the in-person training we will schedule.

Note: There is no specific training fee, however users may incur scope use fees during training. I'll be sure to point this out if it applies to you, but please let me know if you have any questions or concerns.

3. Once we have scheduled our in-person training session, I will send you links to the training guide and a training movie. Please download or print the guide, and watch the training movie before our in-person training session. It may be helpful to have a copy of the guide with you when you do the training, to follow along and take notes.

I am looking forward to working with you, Giulia

Hi,

Effective Communication

Challenge: Diverse audience with varied backgrounds, knowledge, experience and learning styles- how do you deliver training to meet everyone's needs?

What does teaching and learning science tell us? Accessibility and inclusivity are important, and the way you communicate sets the tone of the learning environment!

- Create a **positive learning environment** that centers equity and uplifts diversity- when people feel respected and valued, it has a significant impact on belonging, motivation and self-efficacy, and therefore **success**.
- Be intentional with your "instructor talk"- language used by an instructor that is not directly related to the concepts under study but instead focuses on creating the learning environment.

Examples of "Instructor Talk"

Explaining pedagogical choices:

"I've structured the asynchronous training activities into digestible, ~30 minute modules so you can pace yourself in a way that helps you retain the information."

Humanizing the experience and boosting self-efficacy:

"I know this microscope looks really complicated and overwhelming, that's natural right now, but I also know that with good training and practice all of you will be pros at using it in no time."

Signaling it's ok to be unsure or forget, and that there is always support available:

"Remember, if you are unsure or feel like you're forgetting a step, you can always reference the checklist next to the scopre, and/or scan the QR code next to the scope to pull up the scope guide. And, I'm always down the hall if you need anything."

Messaging that you are open to feedback:

"I am always working on improving my training sessions, and I a learn a lot from all of your different experiences and applications. If you could please take a moment to fill out this survey, I would greatly appreciate it." The UDL Guidelines are a tool that can be used to improve and optimize teaching and learning for all people based on scientific insights into how diverse humans learn.

Universal Design for Learning (UDL)

Design Multiple Means of Engagement	Design Multiple Means of Representation	Design Multiple Means of Action & Expression
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Multiple means of engagement:

- Optimize challenge and support
- Offer action-oriented feedback
- Recognize expectations, beliefs, and motivations

Multiple means of representation:

- Support opportunities to customize the display of information
- Clarify vocabulary, symbols, and language structures
- Connect prior knowledge to new learning

Multiple means of action and expression:

- Optimize access to accessible materials and assistive and accessible technologies and tools
- Use multiple media for communication
- Organize information and resources

Effective Structure and Delivery



Challenge: A lot of material to cover and it's ALL critically important.



What does teaching and learning science tell us? High structure and mixed modalities improve learning and performance.

- Organization is <u>key</u>- use a modular structure that includes a consistent combination of information delivery, practice and assessment.
- **Tip:** Break content up into approachable and accessible chunks.
- Communicate learning goals/objectives/outcomes explicitly, and be sure content/organization is aligned with them.
- Create easy-use and easy-access resources for users (during training and during use).
 - Workflow checklists
 - QR codes to user guides or feedback forms

Examples

• Week 4	0 • +	I
ii 🕑 Week 4 Info & Announcements	0	I
E Slide Decks	•	1
BIOL80A Class 7.pdf	•	i
1 🛷 BIOL80A Class 8.pdf	۰	1
11 Class Recordings	•	I
∃ d ⁰ Class 7 Recording (10/22/24)	•	:
∏ d ⁰ Class 8 Recording (10/24/24)	•	1
II Assignments & Assessments	•	:
1 d ⁰ Mid-quarter feedback survey (please respond)? 🕞	0	I
ii Resources	•	1

Canvas LMS, Google Site/Drive, tabbed Google Doc...

Module 1 Learning Outcomes

At the end of this modules, trainees will be able to:

- Identify the 12 parts of the scope labeled and described in the guide.
- Turn the scope on/off, and open/close the imaging software.
- Load a slide with a fixed sample onto the stage and locate/focus on the specimen.
- Capture an image using the following settings:

Read: Module 1 (5 pages) and study Figure 1.1 (~15 minutes).

Watch: Module 1 Tutorial- Basics of using the scope (10 minutes).

Assessment: Module 1 Quiz (10 questions, 5 minutes) prior to in-person training session, which will begin with trainee executing the Module 1 learning outcomes on the scope before moving on to Module 2 in-person training.



Creating Opportunities for Practice

Challenge: training often doesn't include an experiential component that leaves users somewhat unprepared for *actually using* the equipment well.

What does teaching and learning science tell us? Hands-on experience is the way we build SKILLSwe require context for transfer and application of knowledge.

- Create authentic, low-stakes opportunities for people to **practice** using what they've been learning during training ON the equipment (this is *active* learning).
- This provides users with important realtime **feedback** <u>while learning</u>, and they'll have you there to support them. This is not a test.
- This is also a great opportunity to leverage **peer-peer learning** have people work in groups on a task. They can support each other, and/or dialogue with you before you intervene.
 - You get a lot of information out of this too! Try to watch and listen as much as possible.

Assess Effectiveness and Incorporate Feedback

Challenge: training doesn't seem to prevent common mistakes or repeated need for support/intervention, and/or users don't seem to take training seriously. What does teaching and learning science tell us? Measuring how well your teaching results in students achieving learning outcomes is a data-driven approach to improving teaching effectiveness.

- An assessment plan can be as simple as a quiz/survey, but needs to be well designed/aligned with learning goals/outcomes/objectives (→backwards design).
- You will get useful information on where training can be improved.
- **Tip:** Bring the feedback surveys into the training program/session to increase response rates!
- You can also use the opportunity to get broader feedback about how users are experiencing the training, that might inform some valuable improvements to communication and messaging, structure and delivery, effectiveness, and climate of the training sessions.
 - Anonymous feedback

Backwards Design

"Backward design" is a planning framework that prioritizes the *intended learning outcomes* instead of "all the topics that need to be covered".

3 step process:

- **1. Identify desired results** what do you need trainees to be able to know and do after training?
- 2. Determine the acceptable evidence- how will you and trainees know they've mastered a learning outcome?
- **3. Design** the training/course learning experiences, instruction, and assessment to match learning outcomes and process.

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30-second reflection:

What are a few takeaways or areas of growth for you in addressing your current training challenges?

A few resources:

Inclusive Teaching: https://www.lifescied.org/doi/10.1187/cbe.19-01-0021

- Dewsbury, Bryan, and Cynthia J. Brame. 2019. "Inclusive Teaching." CBE Life Sciences Education 18 (2): fe2.

Instructor Talk: https://www.lifescied.org/doi/10.1187/cbe.15-03-0049

- Seidel, Shannon B., Amanda L. Reggi, Jeffrey N. Schinske, Laura W. Burrus, and Kimberly D. Tanner. 2015. "Beyond the Biology: A Systematic Investigation of Noncontent Instructor Talk in an Introductory Biology Course." CBE Life Sciences Education 14 (4): ar43.

Universal Design for Learning (UDL) Guidelies: https://udlguidelines.cast.org/

Backwards Design: (Vanderbilt Center for Teaching; Short Video by Grant Wiggins included): <u>https://cft.vanderbilt.edu/guides-sub-pages/understanding-by-design/</u>

- Bowen, R. S. (2017). Understanding by Design. Vanderbilt University Center for Teaching. Retrieved [Nov 11 2024] from https://cft.vanderbilt.edu/understanding-by-design/.

Thank you.

Questions?