

We will use some electronic documents you can download from this mini-workshop's page:
http://serc.carleton.edu/earth_rendezvous/2015/mini_workshops/mw3/index.html

If you're here early, get a tab for this in your browser.

Online and Hybrid Learning Mini-Workshop

Earth Educator's Rendezvous

Boulder, Colorado, 13 July 2015

Sara Harris (facilitator), University of British Columbia

Many thanks to: Simon Bates, Lucas Wright, Kele Fleming, Joseph Anthony, Leah MacFadyen, and the Carl Wieman Science Education Initiative at UBC

Hello!

- What's the first thing that comes to your mind when you hear "online and hybrid learning"?
- What's your experience with online or hybrid learning?
- What scares you most about "online and hybrid learning"?

What's the first thing that comes to your mind when you hear "online and hybrid learning"?



When poll is active, respond at [PollEv.com/sarahharris707](https://www.poll-ev.com/sarahharris707)



Text **SARAHARR**

opportunities to learn more about student learning
usually large class sizes

"superficial learning and lack of personal interaction"

about 7 hours ago

Student and teach frustration

money maker for university

fewer hands-on activities

superficial learning and lack of personal interaction

man power and hours

"man power and hours"

about 7 hours ago

A different way to learn...

lonely

blackboard ;(

No lecture from prof

"A different way to learn..."

about 7 hours ago

Non traditional students taking classes online, often getting frustrated

school mandate

lots of work to help students really learn

those are 2 different things

content management system

frustrating learning management systems

"lonely"

about 7 hours ago

pain in the ass

Money

usually large class sizes

"blackboard ;("

Student and teach frustration

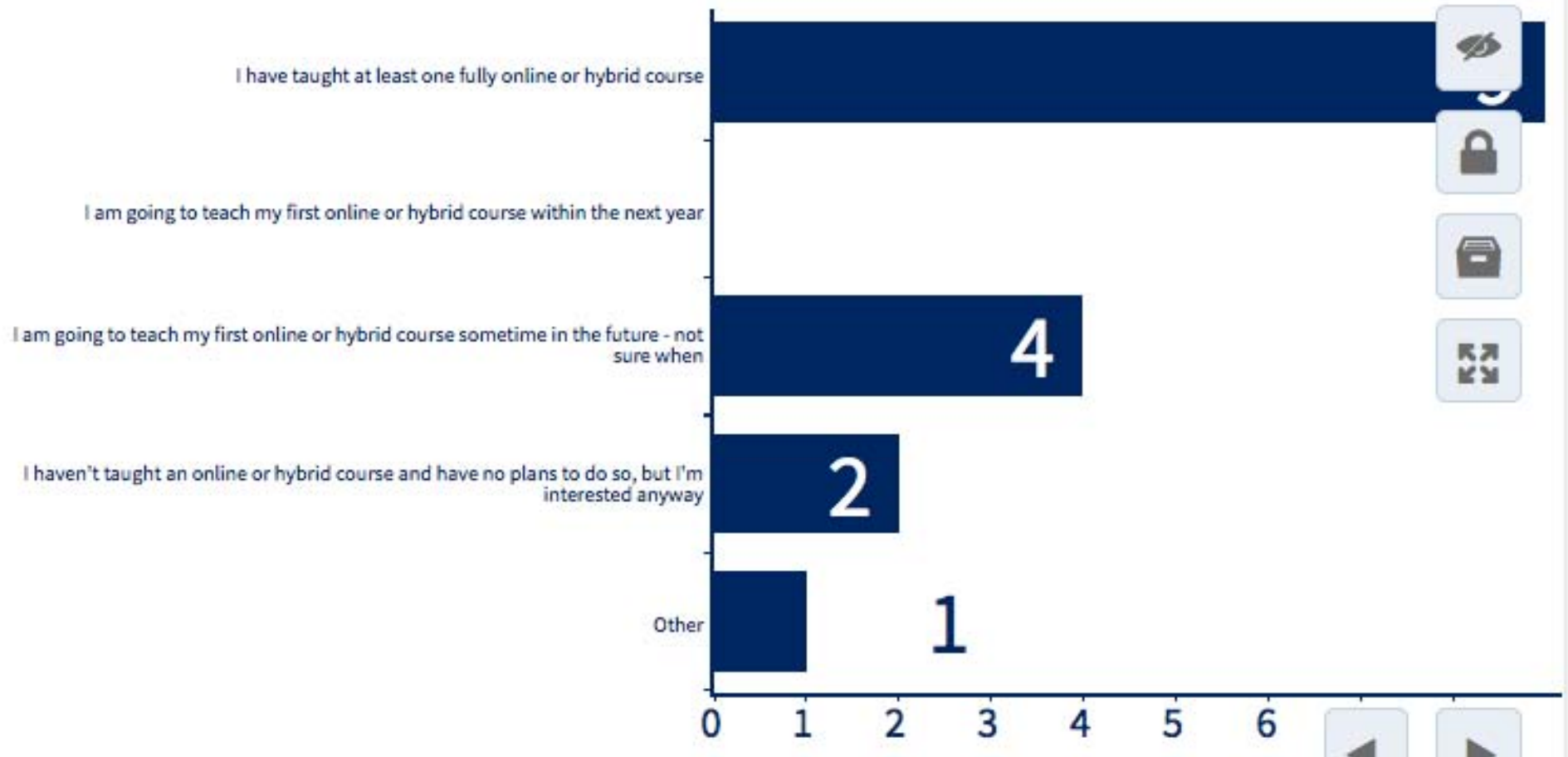
What's your experience with online or hybrid learning?



When poll is active, respond at Pollev.com/saraharris707



Text **SARAHARRIS707** to **+17474443548** once to join



What scares you most about online and hybrid learning?

Respond at PollEv.com/saraharris707

Text **SARAHARRIS707** to +17474443548 once to join, then text your message

“being organized -- dealing with online forum”

about 7 hours ago

“students can't get their hands on rocks!”

about 7 hours ago

“time to create new course”

about 7 hours ago

“students not learning”

about 7 hours ago

“grading”

about 7 hours ago

how to guide students during "labs"
students ho don't know how to navigate the software
less stimulating lab environment
Making sure students understand what they are doing
creating a meaningful learning experience
I hear that student success rates are really low.
technology not working
Students not engaged
lab
being organized -- dealing with online forum
students can't get their hands on rocks!
time to create new course
students not learning
grading
student cheating

Workshop Goals

- Compare opportunities, barriers, and best practices among on-line, hybrid, and face-to-face learning settings.
- Develop a draft on-line or hybrid course structure that fits your context.
- Outline one draft module for your on-line or hybrid course, with specific goals, assessments, and activities aligned.

Or, apply evidence-based best practices to online or hybrid contexts

Is online & hybrid learning effective?

- Meta-analysis by Means et al., 2010, US Dept of Education:
 - Average effect size of 0.20 favoring online & hybrid over f2f learning
 - Average effect size of 0.35 favoring hybrid over f2f
 - Larger effect sizes when online work was collaborative or instructor-directed, compared to students working independently.
 - Smaller differences between f2f and online outcomes when instruction approaches are similar
- Jensen et al., 2015 finds no difference between active flipped and active f2f student outcomes.

Conclusion: Not worse than f2f. Can be better than f2f.

Opportunities?

- Individually: Write down as many things as you can that you view as “opportunities” offered by an online or hybrid format
- Groups of 3: Share, compile, and rank top 3 opportunities
- Full group: Compile top contenders

You can do this on paper or electronically. You can download a docx file with the prompt from this mini-workshop page:

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Opportunities: top contenders

(these were generated at the workshop)

- Engagement (in & out of classroom)
- Non-traditional: fewer time and geography constraints.
Flexible
- Individual resources, self-direction
- Variety of resources for “learning styles”
- Underserved populations
- People who would never take geo
- Diversity from the student group, local env
- Assessment opportunities
- Increase enrolment
- Learn more about student learning

Barriers?

- Individually: Write down as many things as you can that you view as “barriers” to your development of an online or hybrid course
- Groups of 3: Share, compile, and rank top 3 barriers
- Full group: Compile top contenders

You can do this on paper or electronically. You can download a docx file with the prompt from this mini-workshop page:

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Barriers: top contenders

(these were generated at the workshop)

- Tech problems, LMS
- Overhead \$\$, time, management
- Student resistance
- Tech changes quickly
- ADA issues
- Labs – raw materials
- Lack of research for geoscience online
- Development/sense of learning community,
- Students slipping through cracks
- Self-discipline, student perceptions
- Keeping materials updated
- Institutional support

Best practices?

*“7 Research-Based Principles for Smart Teaching”
from *How Learning Works* (Ambrose et al., 2010)*

- **Prior Knowledge** Students' prior knowledge can help or hinder learning
- **Knowledge Organization** How students organize knowledge influences how they learn and apply what they know
- **Motivation** Students' motivation generates, directs, and sustains what they do to learn
- **Mastery** To develop mastery, students must acquire component skills, practice integrating them, and know when to apply what they have learned
- **Goal-directed Practice** Goal-directed practice coupled with targeted feedback enhances the quality of students' learning
- **Student Development & Course Climate** Students' current level of development interacts with the social, emotional, and intellectual climate of the course to impact learning
- **Metacognition**
To become self-directed learners, students must learn to and adjust their approaches to learning.

Applying these principles in online & hybrid formats – Stage 1

- Seven groups, one for each principle:

As a group, figure out:

What types of learning opportunities & assessments could you provide in online and hybrid environments that would apply this principle in support of student learning (think “active learning”)?

You will each need to fill in a colored worksheet because you’ll be taking it to another group later

http://serc.carleton.edu/earth_rendezvous/2015/mini_workshops/mw3/index.html

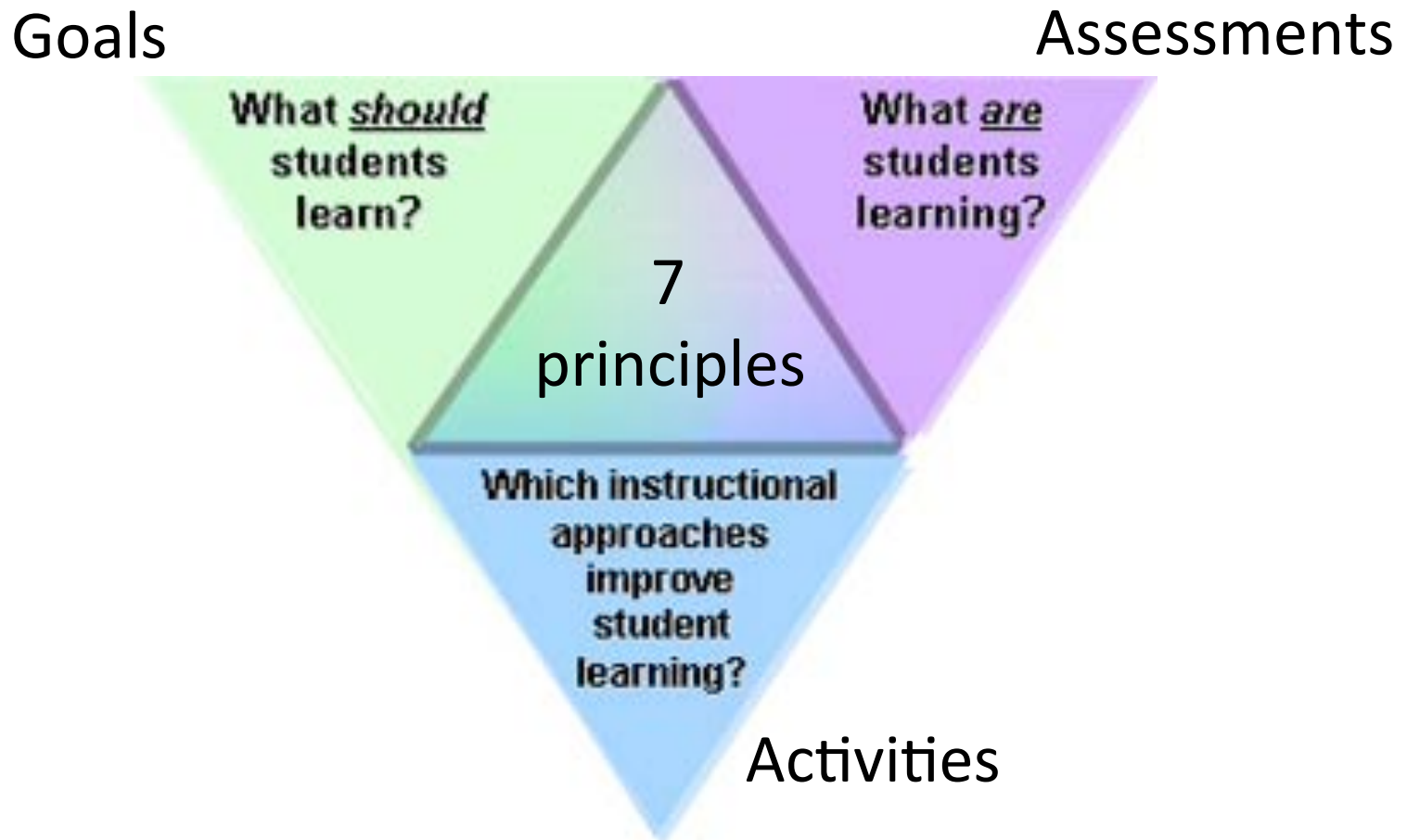
Debrief

- Online approaches that align with principles?
(one from each group)

(We went directly to the 2nd stage of the jigsaw activity)

Align goals, assessments & activities

Apply principles



Applying these principles in online & hybrid formats – Stage 2

- Count off within your groups
- Form new groups so that each group has 7 people, one from each principle
- Briefly, introduce yourself & your principle

Applying these principles in online & hybrid formats – Stage 2

In your new group, consider some variant of this learning goal:

Students will be able to interpret a geologic map (or a satellite image of surface ocean temperatures, or an image of the surface of Mars, or...)

Together, outline a sequence of assessments and learning activities for a fully online course that incorporates as many of the 7 principles as you can.

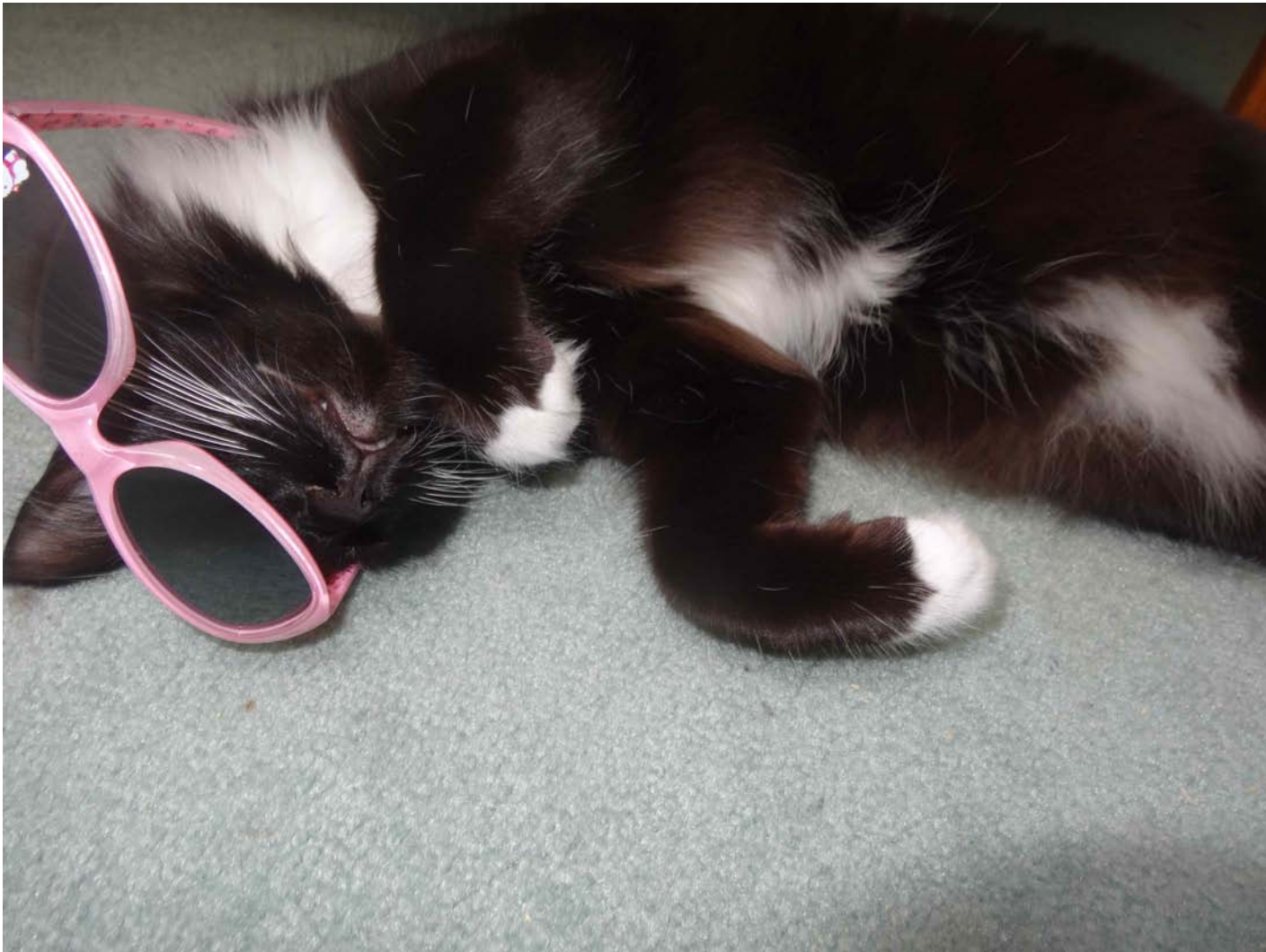
Start generally (e.g. students will work with an interactive simulation about strike and dip). Get to details if you have time, e.g. don't bog down in specific assessment questions or specific details of activities.

Debrief

(these were generated at the workshop)

- Great ideas?
 - Pre-surveys and pre-quizzes
 - Basic map reading skills
 - What would an expert do? Questions.
 - Virtual field sites. See virtual example before they do it.
 - Eportfolio – reflect on info organization, respond, realign.
 - Fear – jigsaw so people are responsible. Instructor-directed examples, build cross-sections online. Build confidence. Bribery. Authentic task. Current events.
 - Feedback from quizzes.
 - Start simple, give feedback. Peer review.
 - Group activities, blogs, webinar, discussions, integrate social media,
 - Discuss how they studied, how well it worked
 - Regular announcements, informal 5-min videos, icebreaker discussions – personal lives + course topics, target topics students found confusing, virtual study halls. Space for them to help each other. Post a video of yourself. Have students do videos too for icebreakers.
- Sticking points?
 - Tech problems w/big files.

Let's take a break

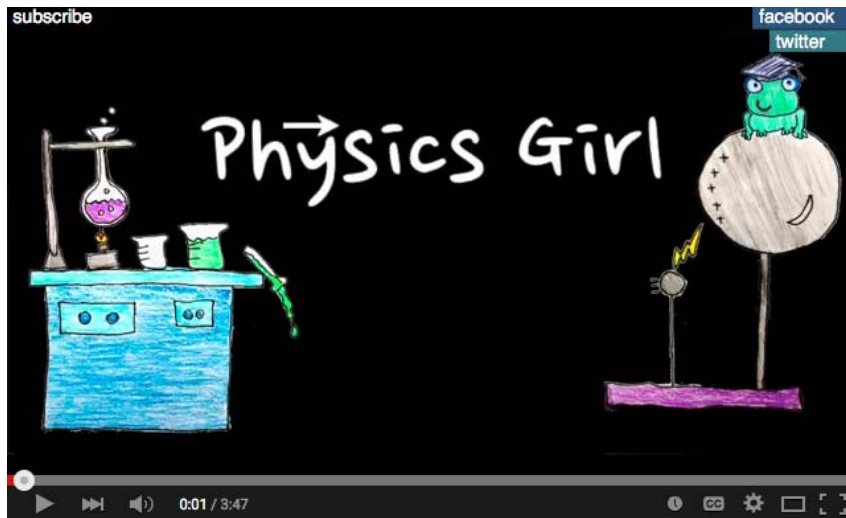


Active learning strategies for online and hybrid environments

- Content learning with embedded practice
- Authentic problem solving
- Interactive simulations
- Students generating and sharing content
- Synchronous & asynchronous discussions (students can facilitate)
- Frequent, relevant assessments with timely feedback (take advantage of automation)
- Peer assessment
- Collaborative group work (plan your groups carefully)
- ...

About videos...

(thanks to Marsha Lovett for these examples)



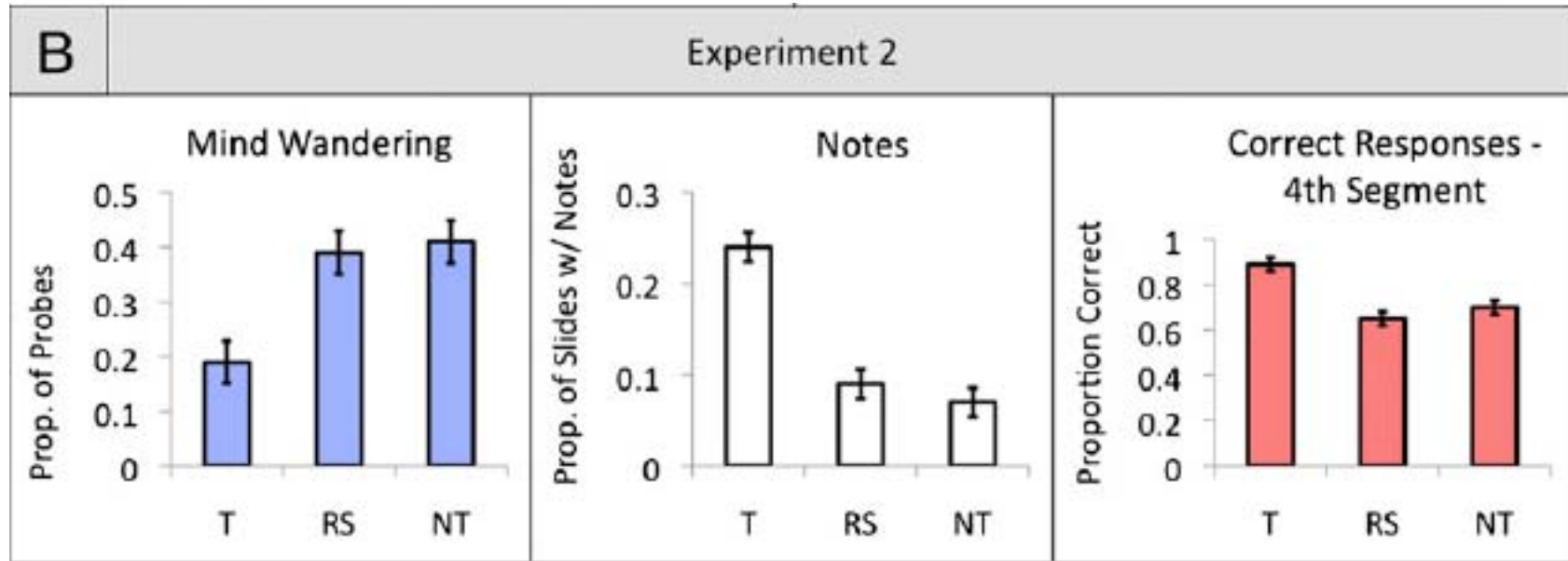
Could you articulate a learning goal each of these videos is targeting?

Physics Girl – <https://www.youtube.com/watch?v=vBpxhfBIVLU>

John Green – English prof <https://www.youtube.com/watch?v=MSYw502dJNY>

About mind wandering...

T=Tested RS=re-study NT=Non-tested



Spzunar et al., 2013, Fig 2

When students are periodically tested on video material, mind wandering goes down, note-taking goes up, and performance goes up.

About videos...

- Align with goals. What should students be able to do after watching?
- Incorporate practice with feedback into watching (e.g. embed Qs)
- Plan carefully – videos can be expensive and time consuming.
- Videos should be short (<10 min)
- Reuse! There are lots of videos and lots of online material already created by others. You don't need to create everything yourself, unless that's what you love to do.

What's your context?

(We skipped this)

- Course description: title, size, level, fully online or hybrid
- High-level course goals? (Don't spend too long here)
- Resources: TAs, teaching & learning staff, electronic resources (e.g. LMS)
- What do you want to do to create an online or hybrid learning environment in your context? What's appealing? Rough & random ideas are fine.

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Share

(We skipped this too)

- In pairs, share one thing about your context that you find most challenging, or intriguing, or exciting (could be a cool idea).
- Respond/provide feedback to your partner

Ideas for active learning online in earth sciences

- Use publicly available databases – have students extract, interpret & present relevant data (e.g. on a blog site). Open-ended, authentic practice.
- Use existing interactive resources:
 - PhET (e.g. greenhouse effect, glaciers, radiation...) <https://phet.colorado.edu/en/simulation/glaciers>
 - Visible Geology (3D visualizations, construct & deconstruct sections) <http://app.visiblegeology.com/>
 - Online interactive climate models (e.g. C-Learn or EdGCM) <https://www.climateinteractive.org/tools/c-learn/>
 - Google Earth (see SERC collection for activity ideas)
 - Virtual Field Trips (see SERC collection)
 - Games: <http://siogames.ucsd.edu/about.php> (from Heather Lehto)

Ideas for active learning online in earth sciences

- Consult Teaching Geoscience Online at SERC
<http://serc.carleton.edu/NAGTWorkshops/online/index.html>
 - Examples of active learning online
 - Resources for best practices
 - Tips
 - Links to geoscience-related databases
 - Links to lessons and assessments

What are you going to do?

□ Goal 3

(Yep, we didn't do this either. Instead, we had a discussion of what people might do differently the next time they teach online)

- Outline one draft module for your online or hybrid course.
 - Pick a relevant learning goal
 - Draft your ideas around assessment
 - How will you implement these in your online or hybrid context?
 - Draft your ideas for active learning activities
 - How will you implement these in your online or hybrid context?
 - Check to see that your goals, assessments and activities are aligned with one another.
 - Check to see if you are applying any of the 7 principles.
 - Revise.

http://serc.carleton.edu/earth_rendezvous/2015/mini_workshops/mw3/index.html

Share

(see previous slide)

- In pairs, share your alignment of goals, assessments, and activities.
- Respond/provide feedback to your partner

Some best practices for online and hybrid environments

- Create and encourage a collaborative, interactive learning environment
- Have a social presence yourself
- Clear communication, organization, expectations
- Provide formative feedback early
- Ask for feedback & suggestions from students
- Encourage students to explicitly reflect on their learning

Google “best practices online learning” for more

Wrap-up

- The same principles of good practice apply to online and hybrid learning as apply to f2f
- Applying principles of good practice will take different forms in online & hybrid vs f2f format
- Online and hybrid formats provide excellent opportunities for higher level learning, e.g. students generating and sharing content
- Opportunities to take advantage of instructor expertise
- Clear communication is extra important in online and hybrid formats

(A few) Resources

- SERC's Teaching Geoscience Online:
<http://serc.carleton.edu/NAGTWorkshops/online/index.html>
- Guide to Synchronous & Asynchronous Discussions:
<https://net.educause.edu/ir/library/pdf/MAC0426.pdf>
- Kevin's Yee's Interactive Techniques list (f2f & online)
http://www.fctl.ucf.edu/teachingandlearningresources/coursedesign/assessment/content/101_tips.pdf
- Conrad, Rita-Mae and J. Ana Donaldson, 2011. *Engaging the online learner: Activities and Resources for Creative Instruction*. Jossey-Bass/Wiley. San Francisco, CA.
- Ambrose, Susan A., et al., 2010. *How Learning Works: 7 Research-Based Principles for Smart Teaching*. Jossey-Bass/Wiley. San Francisco, CA.

Thank you!

Enjoy your online and hybrid teaching!