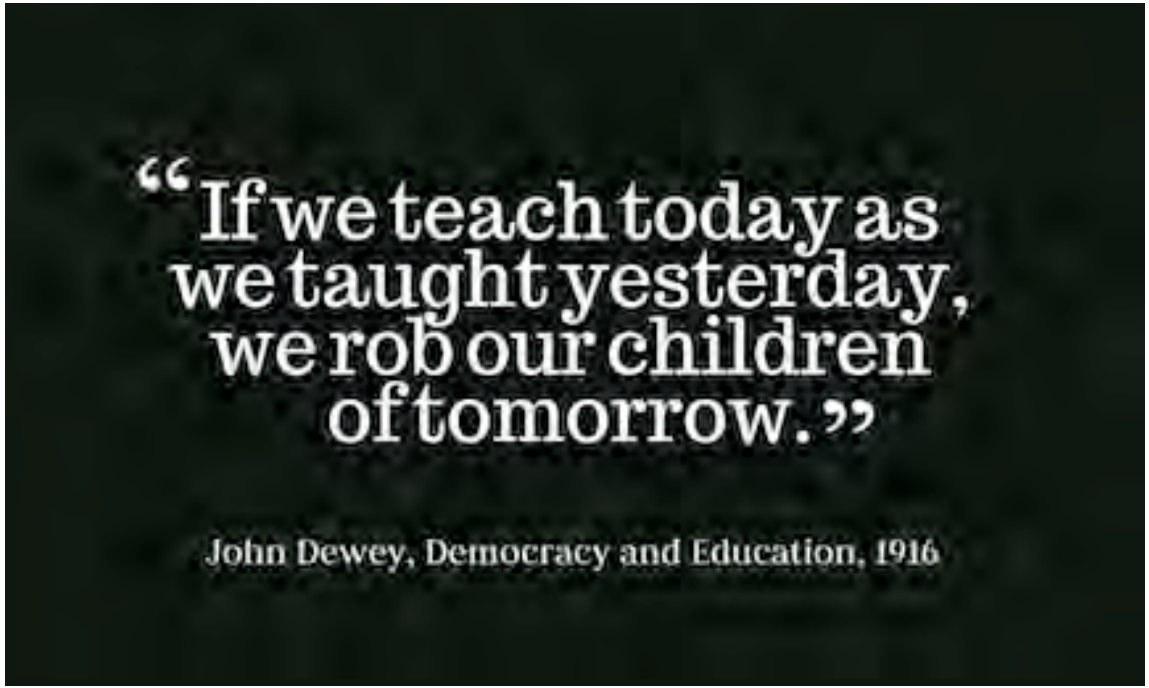
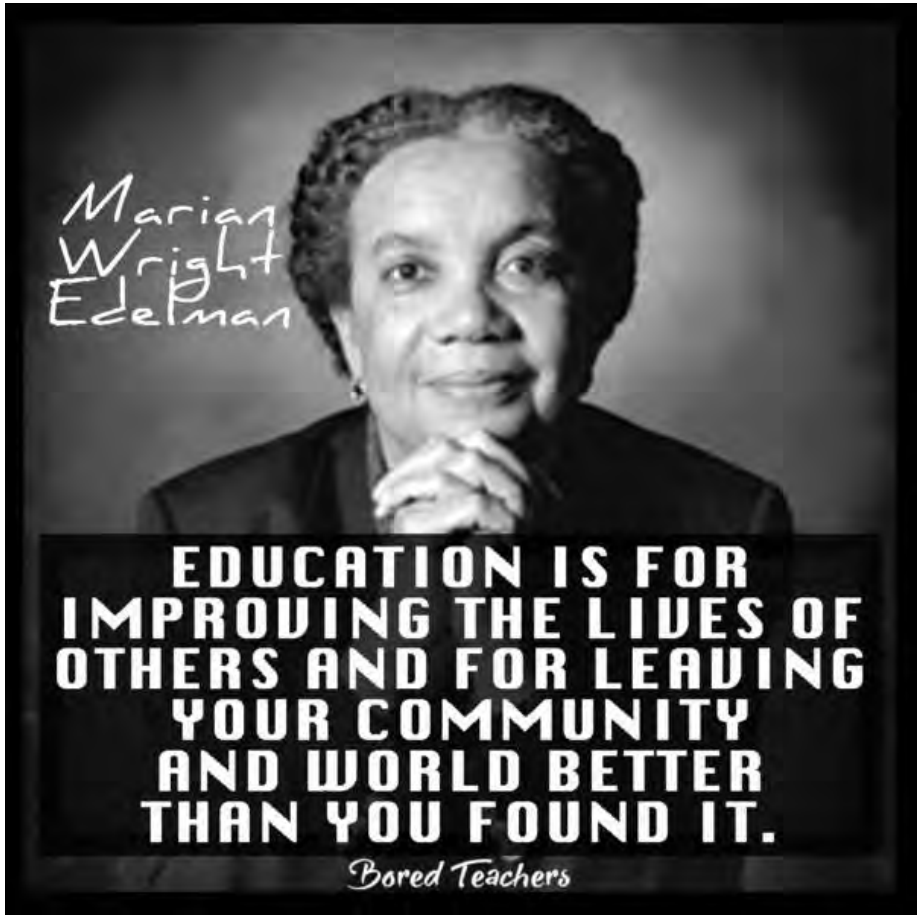
Be brave enough to start a conversation that matters.

Welcome to Today's Webinar

Welcome!

We'll Get Started Soon.





Welcome

Please enter you name, where you're from, and your organization into the chat!

Welcome to the Webinar!

Please enter your name, organization, and where you are from in the chat box.

Welcome! We'll get started soon!

Please enter your name, organization, and where you are zooming in from in the chat box.

Welcome to the Webinar

We'll get started soon!

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Excited about Today's Webinar

Design Principles for Online EE Programs

In the chat…

What are the biggest challenges with online teaching and learning that you've experienced in the past six months!

Amazing Panel!

Bob Powell

Marc Stern

Troy Frensley

Eileen Merritt

12.92 million monthly ZOOM users!

More than 100 million daily meeting participants!

And that's just ZOOM!

Not everyone has access to the internet.

"Memo to self: 'Feathers?'"

CartoonCollections.com

So many of us were not prepared to shift everything online! It happened almost overnight!

Cross-Cutting Principles that Will Help All of Think about What Works!

What makes great virtual learning! How to link to place-based learning?

"virtual education will depend for its success on old-school principles: creative, attentive teaching and patient support from parents"

What We're Learning About Online Learning, New York Times, June, 2020

Thanks to our Affiliate Co-hosts!

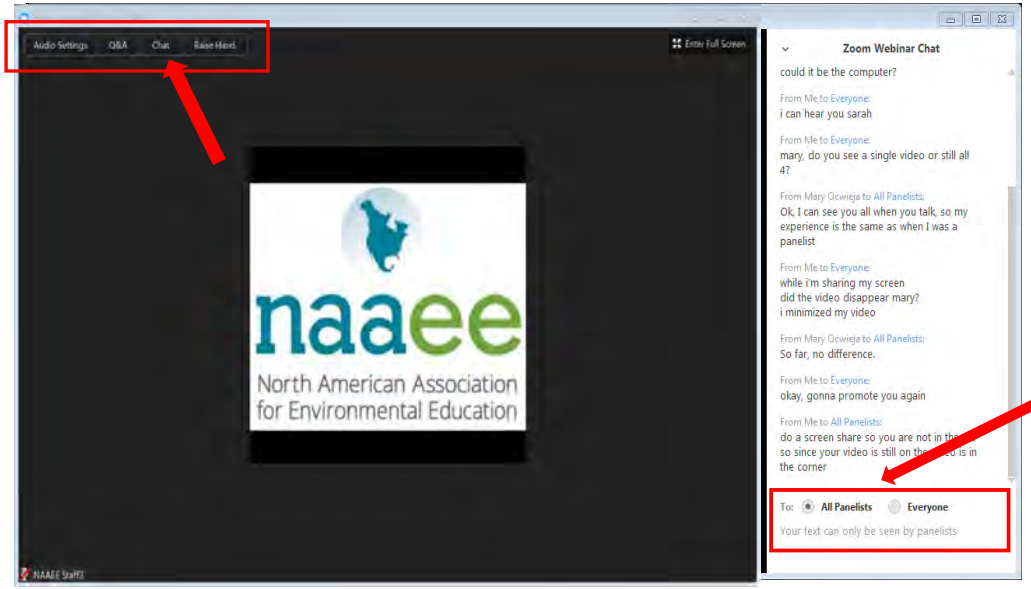
Bringing New Ideas and Insights to the Our Field

Registration Is Open!

Scholarship options for everyone!

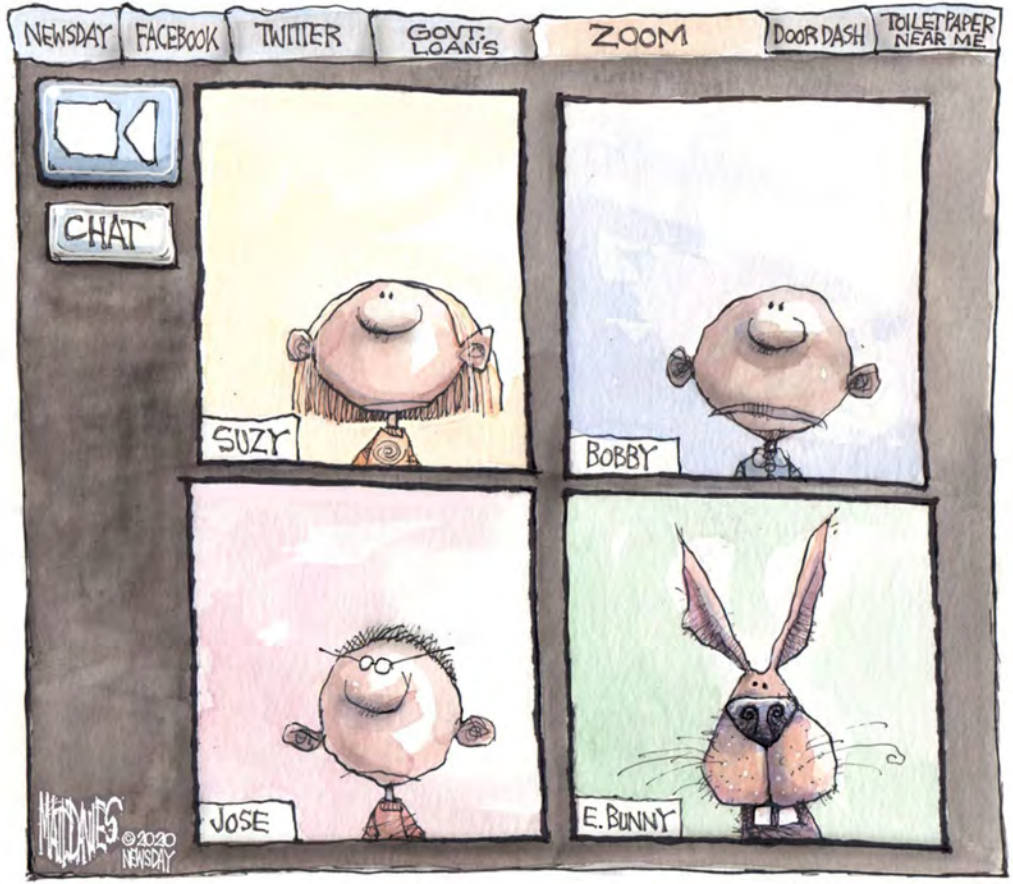
How to Interact With Us on ZOOM

All audio lines are muted. Click “chat” on the black toolbar.



Send a message to the whole group, or just to panelists using the dropdown menu at the bottom of the chat box. You can email the panelists or everyone!

Please type your questions and any resources into the chat box.

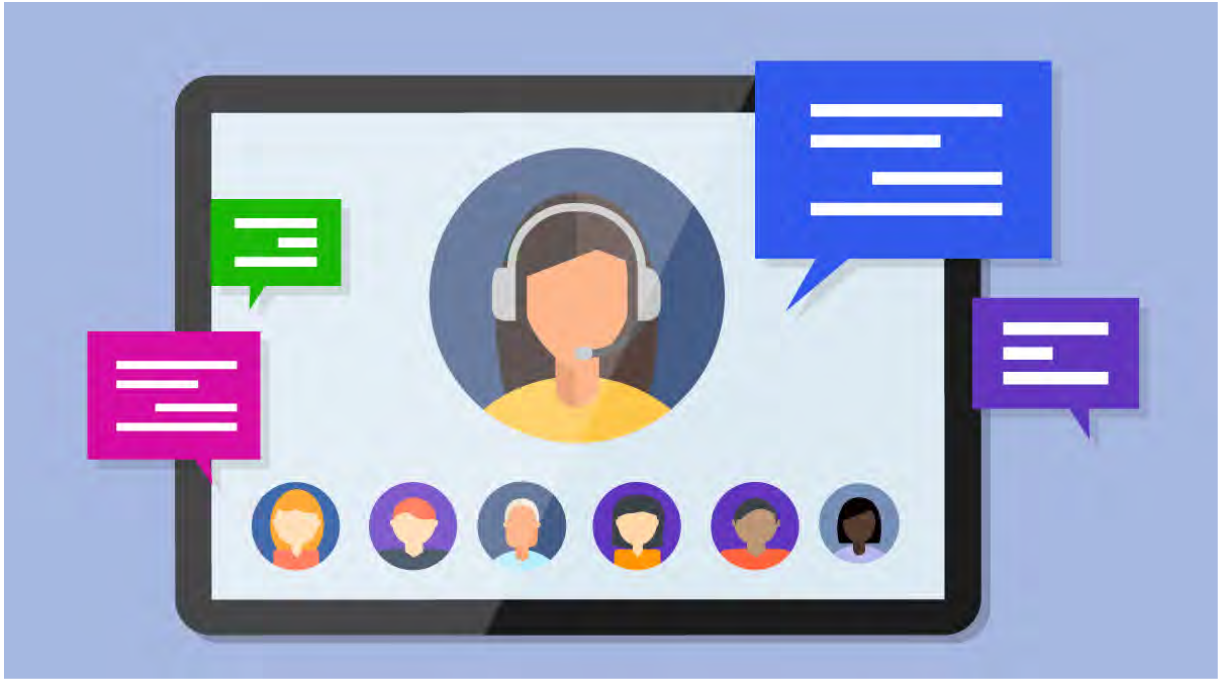


We'll also be recording this, and you'll get a copy of the recording, a PDF of the PowerPoint, and comments in the chat.

We'll take as many questions we can during this time and then answer others on eePRO after this session for more discussion.

(This webinar is 1 hour, with 15 minutes of afterschool!)

We have live captioning today for anyone needing help with the audio.



Thanks to our captioner, Kate Dell'Aiera

Thanks to Anne Umali, our webinar and professional development guru! Please message her directly using the Zoom chat box if you need help.

Director of Professional Development and Manager of ee360

Marc J. Stern

Professor, Department of Forest Resources and Environmental Conservation at Virginia Tech.

His research, teaching, and outreach focus on environmental education, environmental communications, and the human dimensions of natural resource management. His recent book, *Social Science Theory for Environmental Sustainability: A Practical Guide*, translates theory into practice for problem-solving in the sustainability arena.

Bob Powell

Director of the Institute for Parks at Clemson University and the George B. Hartzog, Jr. Endowed Professor in Philosophy, Parks, and Environmental Ethics in the Department of Parks, Recreation, and Tourism Management. His research and outreach program focuses on environmental education, park and protected area management, and ecotourism.

Troy Frensley

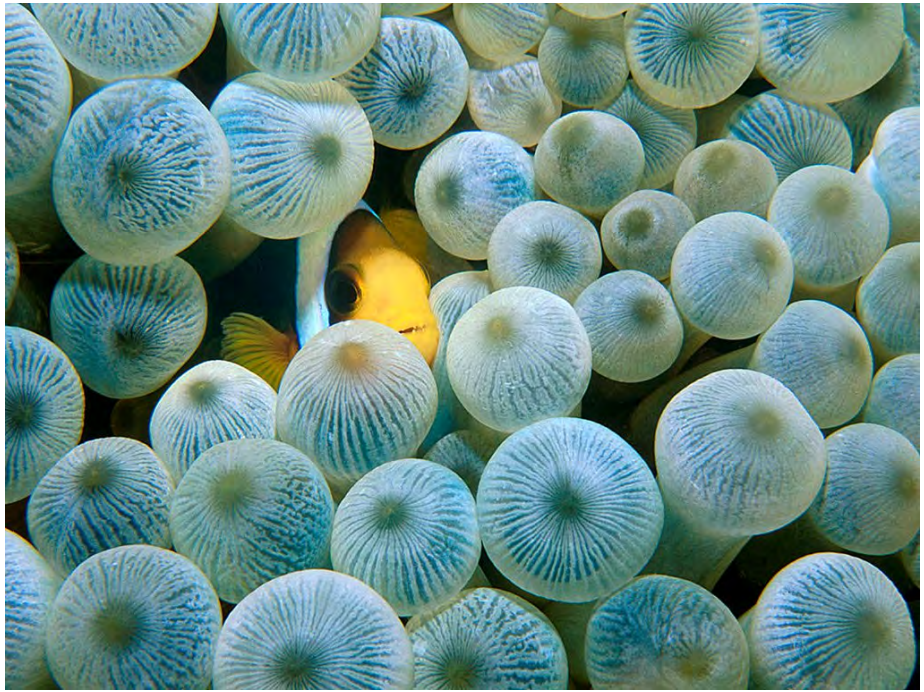
Assistant Professor in the Department of Environmental Sciences at the University of North Carolina Wilmington.

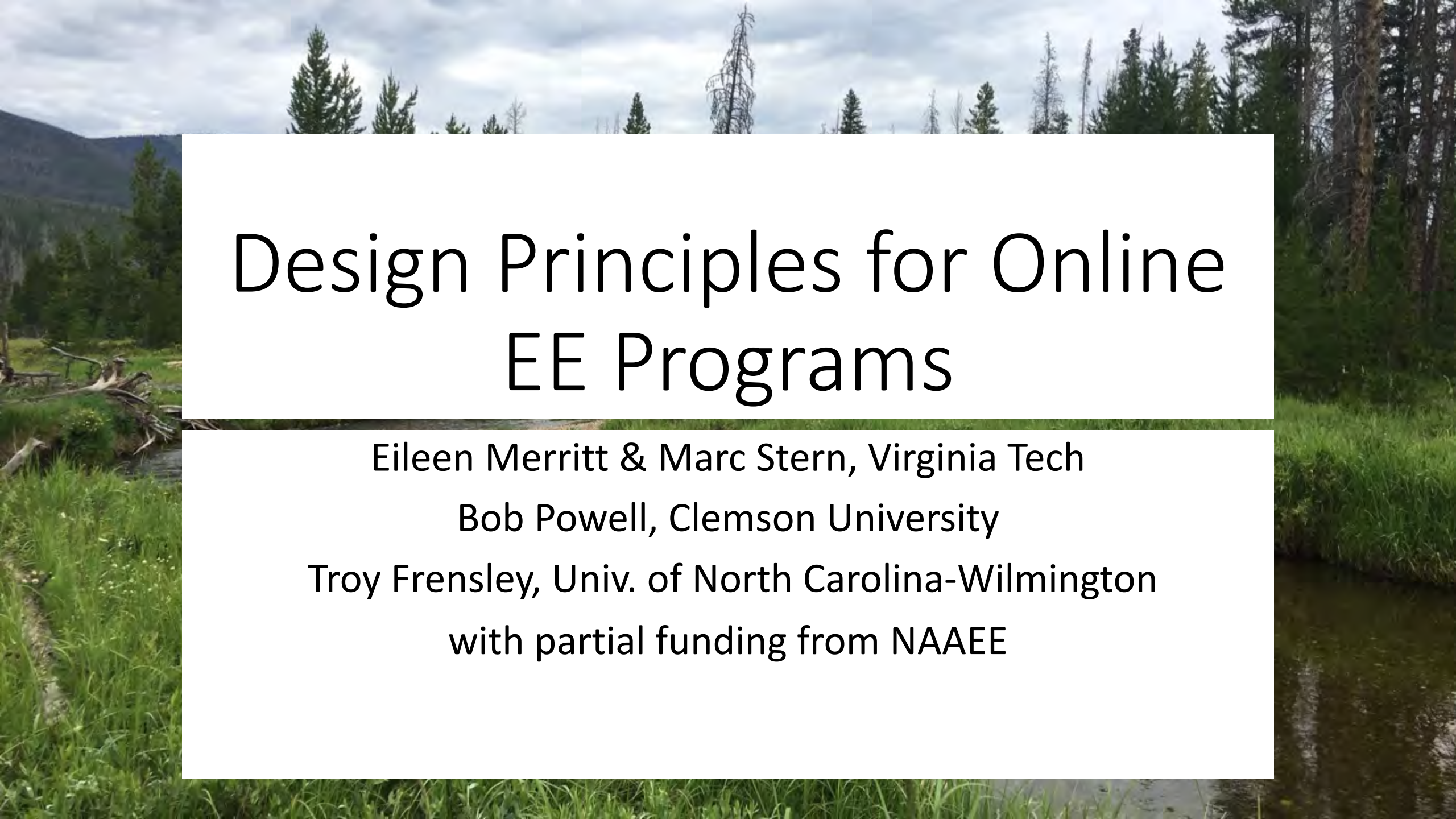
His scholarship and teaching focuses on environmental education, student engagement, and evaluation.

Eileen Merritt

Research Scientist in the College of Natural Resources and Environment at Virginia Polytechnic Institute and University. Her research focuses on supporting environmental educators as they strive to improve learning experiences for their students.

Turning it over to Eileen!





Design Principles for Online EE Programs

Eileen Merritt & Marc Stern, Virginia Tech
Bob Powell, Clemson University
Troy Frensley, Univ. of North Carolina-Wilmington
with partial funding from NAAEE

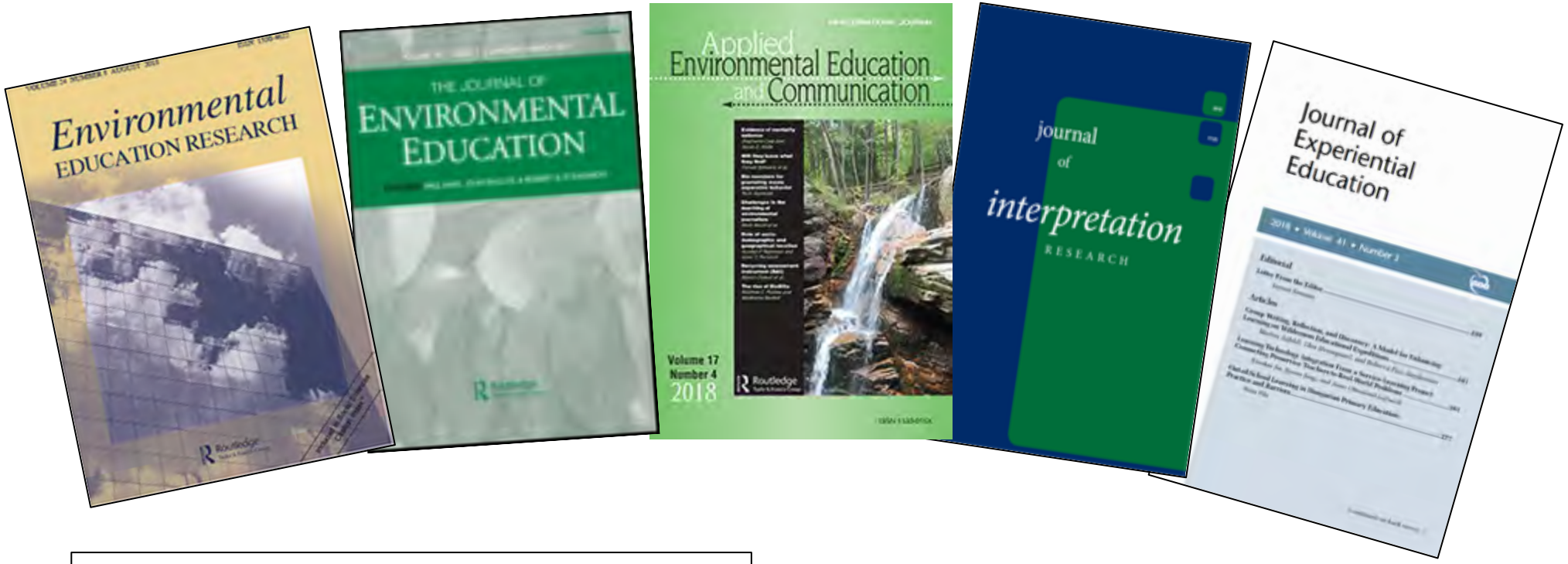
What led me to this research?

Mary Lou Fulton Teachers College
ARIZONA STATE UNIVERSITY

VIRGINIA TECH

Our goal: To find evidence about what works (or does not work) for online/ virtual environmental education in grades K-12

Systematic literature review



Stern et al. 2014. Environmental education program evaluation in the new millennium: what do we measure and what have we learned? *Environmental Education Research* 20(5): 581-611.

Skibins, J.C., Powell, R.B., and M.J. Stern 2012. Exploring empirical support for interpretation's best practices. *Journal of Interpretation Research* 17(1): 25-44.

Empirical studies

Live interpretive programs

- 376 programs at 24 NPS units
- 3,603 participant surveys
- 56 observed program characteristics

Stern & Powell 2013. *Journal of Interpretation Research.* Special Issue 18(2).

EE field trips (grades 5-8)

- 334 programs in 24 states (USA) and DC
- 4,376 participant surveys
- 70+ observed program characteristics

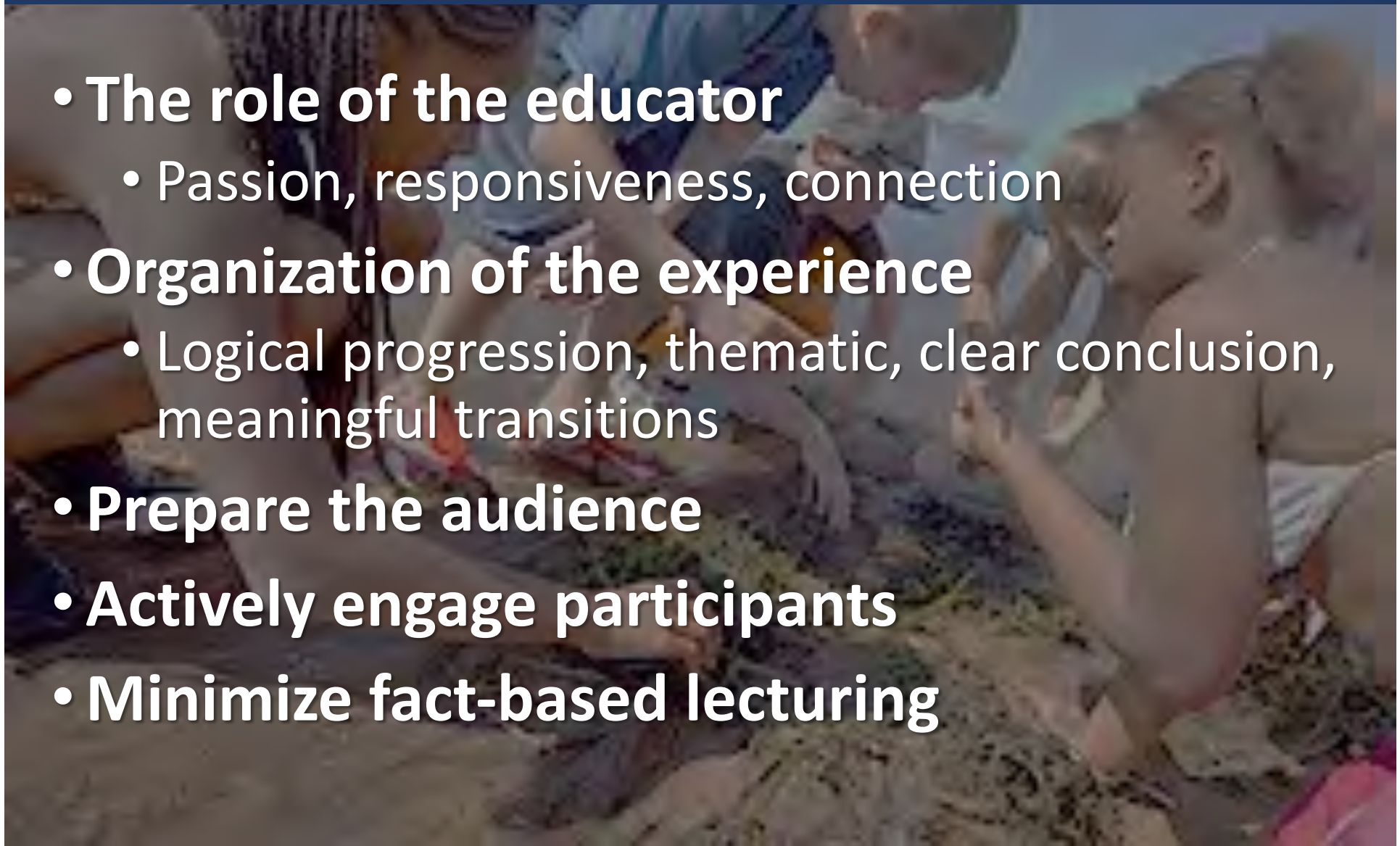
Stern & Powell 2020. Field trips and the experiential learning cycle. *Journal of Interpretation Research* 24(1).

O'Hare et al. 2020. Influence of educators' emotional support behaviors on environmental education student outcomes. *Environmental Education Research.*

Lee et al. 2020. Do pre-visit preparation and post-visit activities improve student outcomes on field trips? *Environmental Education Research.*

Dale et al. 2020. Influence of the natural setting on environmental education outcomes. *Environmental Education Research* 26(5): 613-631.

What have we learned so far?



- **The role of the educator**
  - Passion, responsiveness, connection
- **Organization of the experience**
  - Logical progression, thematic, clear conclusion, meaningful transitions
- **Prepare the audience**
- **Actively engage participants**
- **Minimize fact-based lecturing**

Research Methods

- Articles published from 2010- spring, 2020
- Table of contents review and keyword search (virtual, digital, online combined with environmental education, field trip)
- Narrowed from 153 to 32 articles that included 47 activities/programs
  - Detailed description of program to enable coding
  - K-12 audiences
  - At least one environmental literacy outcome (often 2 or 3)
  - Included an online component
- These articles included virtual field trips, virtual environments, simulations, pre-recorded videos, web-based activities

Coding process

- 2 team members agreed on:
- 100+ codes per article
- Outcomes
- Key Program Characteristics Identified Through:
  - Authors reflections
  - Educator and participant interviews/surveys
  - Statistical modeling
- Limitations
- What did we learn from consolidated evidence across programs?

Design Principles

Designing Content

Relevance

Socio-ecological connections

Positive framing

Visual evidence of environmental change

Challenge

Guidance for Participants

Preparation

Use of multiple modalities

Feedback

Role models

Participant interaction

Autonomy

Peer interactions

Active learning

Designing Content

1. Relevance
2. Socio-ecological connections
3. Positive framing
4. Visual evidence of environmental change
5. Challenge

Relevance

Topics or issues that matter to participants

- Personal connections
- Culture/ Community
- Societal- issues or policies that are the subject of current discourse (e.g. climate change, plastic pollution, clean water)

Photo credit: Lake Powell Life News

Cultural relevance

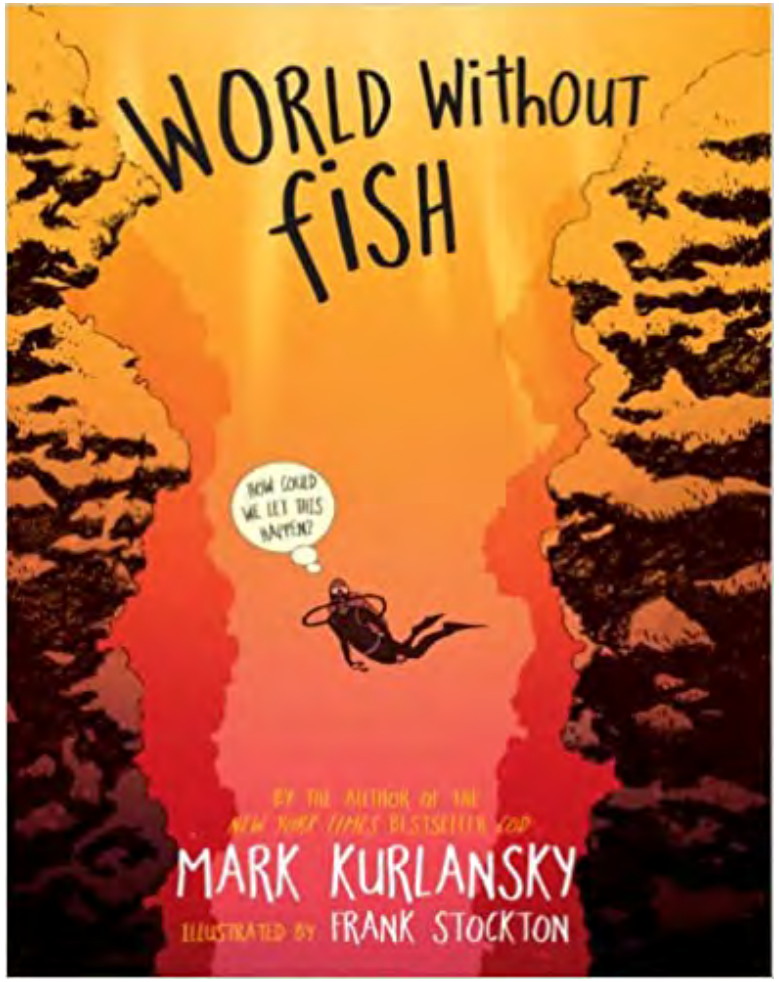
- Cultural connection
- Designed for students who live near that place
- Use of maps (layers), photographs, data to understand THEIR place
  - Exemplar: Placing ourselves on a digital Earth: Sense of place geoscience education in Crow country (Cohn et al., 2014)

a) Repeat photograph taken 1890-1900 and 2011

Make socio-ecological connections

Focus on the connections between people and the ecological systems that surround them

- human impacts on ecosystems, impacts of natural disasters on humans
- relationships between people and the natural world



Positive framing

- Emphasize the potential for positive solutions or outcomes that may arise from individual or collective efforts.
- Draw attention to what can/has/might be done.
- Leave them with feelings of hope and agency

Photo credit: Rick Swart

“The Champion Chub” video

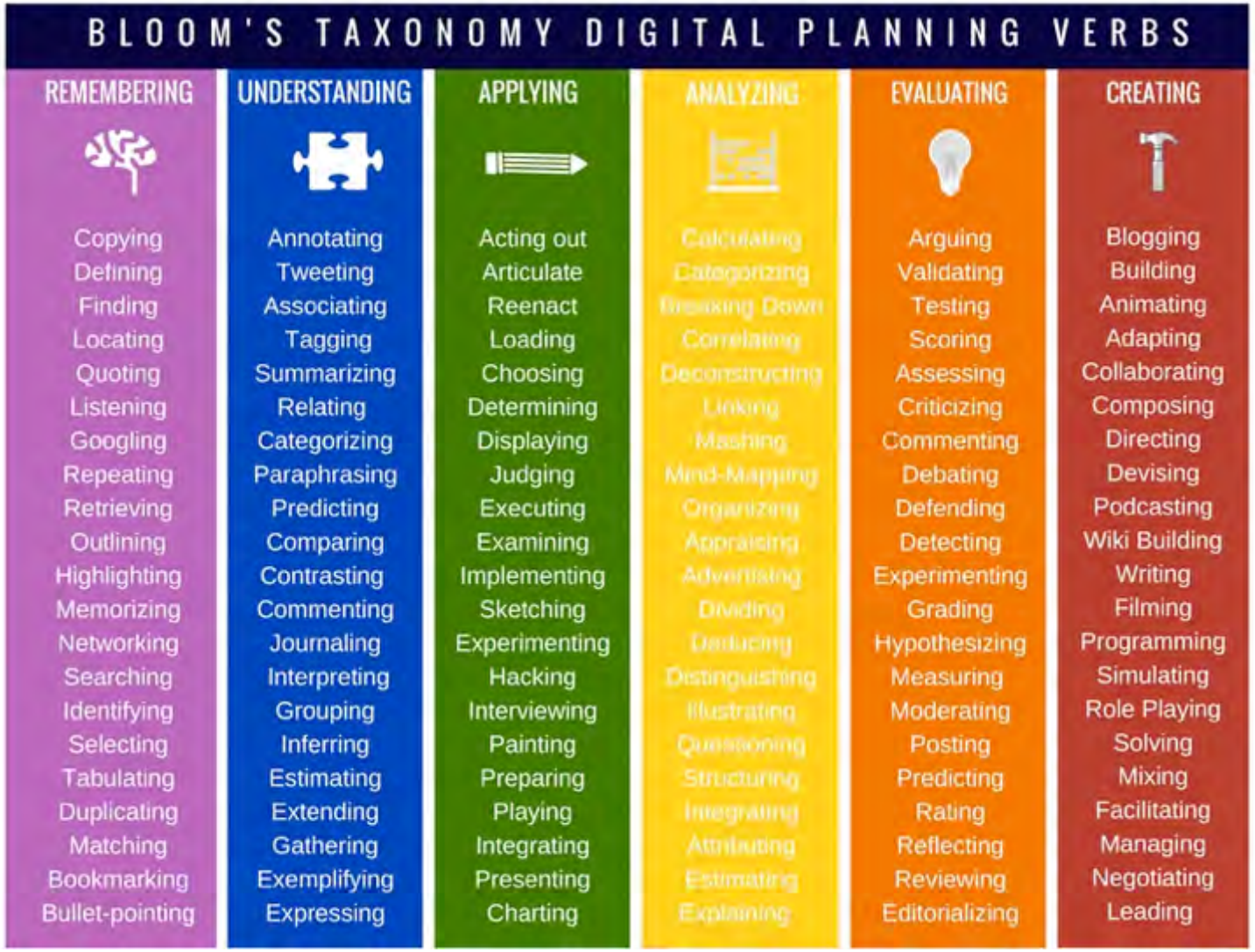
Visual evidence of environmental change

Visual evidence of environmental change

- Changes in organisms, populations, landscapes
- What does observation-based ecology look like online?
- Photographs, videos, simulations, models
- Invite students to consider causes/effects
- Use these artifacts to spark discussions and reflections
- ~~environmental generational amnesia~~

Challenge

- Use your prior experiences with students to consider what they ALREADY know
- Build on and EXTEND learning
- Beyond factual recall
- Require higher cognitive processes
- Ask them to draw connections, justify claims with evidence, solve problems, generate ideas and solutions



Credit: TeachThought Staff

Design Principles: Guidance for Participants

Designing Content ☑

Guidance for Participants

1. Preparation
2. Use of multiple modalities
3. Feedback
4. Role models

Preparation

- Consider needed skills and background knowledge
- Add pre-activities, modules to prepare them for success
- This one connects with challenge – if they have background knowledge to start, they are ready for deeper learning later.

- Suggestions from Big Sky Science Partnership for a program that utilized Google Earth technology:
  - Allow them to explore first, use tools and features
  - Introduce them to layers, how maps and aerial photos interact to provide info
  - Focused lessons on a given theme

Use of multiple modalities

- Students can engage through more than one modality (audio, visual, kinesthetic)
- Technology used to represent concepts in different ways (diagrams, videos, maps, photos, text, models, figures)
- Be clear what to pay attention to, not too much at once (cognitive load)

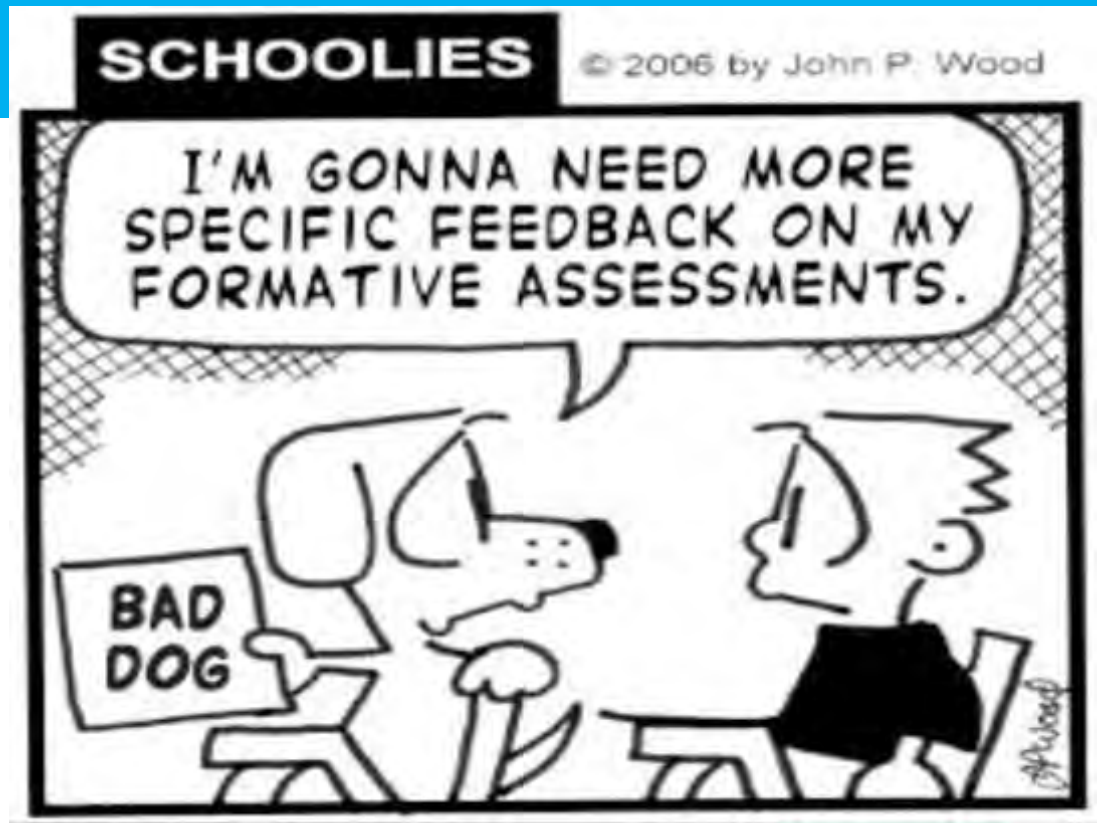
Figure K: Examples of Sensory, Graphic, and Interactive Supports

Sensory Supports	Graphic Supports	Interactive Supports
Real-life objects (realia)	Charts	In pairs or partners
Manipulatives	Graphic organizers	In triads or small groups
Pictures & photographs	Tables	In a whole group
Illustrations, diagrams, & drawings	Graphs	Using cooperative group
Magazines & newspapers	Timelines	structures
Physical activities	Number lines	With the Internet (websites) or software programs
Videos & films		In the home language
Broadcasts		With mentors
Models & figures		

WIDA English Language Development Standards, 2014

Feedback

- Technical guidance
- Understanding of concepts
- Performance
- From educators , peers or embedded within technology design
- Use of VoiceThread
- Feedback can be in audio, video, or written forms.



Role models

- Authentic characters share their knowledge and experiences as they teach about a topic, place or career.
- Model actions or behaviors
- Stories
- Diverse role models

Design Principles: Participant interaction

Designing Content ☑

Guidance for Participants ☑

Participant interaction

1. Autonomy
2. Peer interactions
3. Active learning

Peer Interactions

- Opportunities to work with peers
  - Group work
  - Asking questions
  - Discussions

Autonomy

- Students have opportunities to make choices and direct their own learning experience
- This goes beyond students just being able to click where they want
- Instead giving students some legitimate freedom to explore/learn what interests them most

Active Learning

- Participants are prompted to actively engage with materials or ideas.
- Students generate ideas, ask/answer questions, pose solutions, develop models, or create other products.
- When feasible, combining a virtual experience with real-world or hands-on experiences, may strengthen outcomes.

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Peer interactions

Active learning

Application and Limitations

- Just because you do not see a principle does not mean it isn't important! Some approaches may not have been tested!
- One does not need to emphasize all the principles in one program.
- E-learning is evolving rapidly. We have a lot more to learn!

Looking ahead: Evidence-based Learning Network

- Across a network of 30+ organizations that provide EE-distance learning programs for youth grades 5-12.
- Conduct iterative evaluation using shared common outcomes
- To support informed decision making and subsequent tweeking of programs
- To facilitate inter-organizational learning and sharing about what works
- A vision for EE that embraces both virtual and real-world experiences to increase our collective impacts

Pisces Foundation

What would an organization need to do?

- Across the network collect data in a similar fashion
- Systematic data collection
- Coaching for sampling and data collection
- Data goes to us and we analyze it.
- We provide CONFIDENTIAL Report
- Participate in online learning exchanges

Pisces Foundation

Learning exchanges

- Peer to peer exchanges about what works in your programs (sharing lessons)
- Identifying ways to improve programs
- Documenting changes to programs
- Repeat: Evaluate to see if it worked and foster learning
- More learning!!!! We all improve!

Pisces Foundation

Contact information:

- Eileen Merritt, Virginia Tech: egmerritt@vt.edu
- Marc Stern, Virginia Tech: mjstern@vt.edu
- Bob Powell, Clemson University: rbp@clemson.edu
- Troy Frensley, UNC-Wilmington: frensleyb@uncw.edu


Any final thoughts?

To see the notes, slides, recording

eePRO
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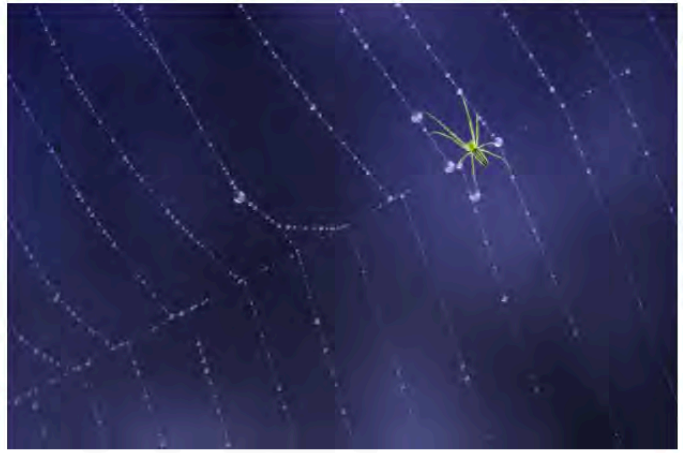
LEARNING

Webinar: Design Principles for Online EE Programs

10 likes



Hours for Learning Activity: 1 learning hour

Date and Time:
Thursday, September 10, 2020, 3:00pm to 4:00pm

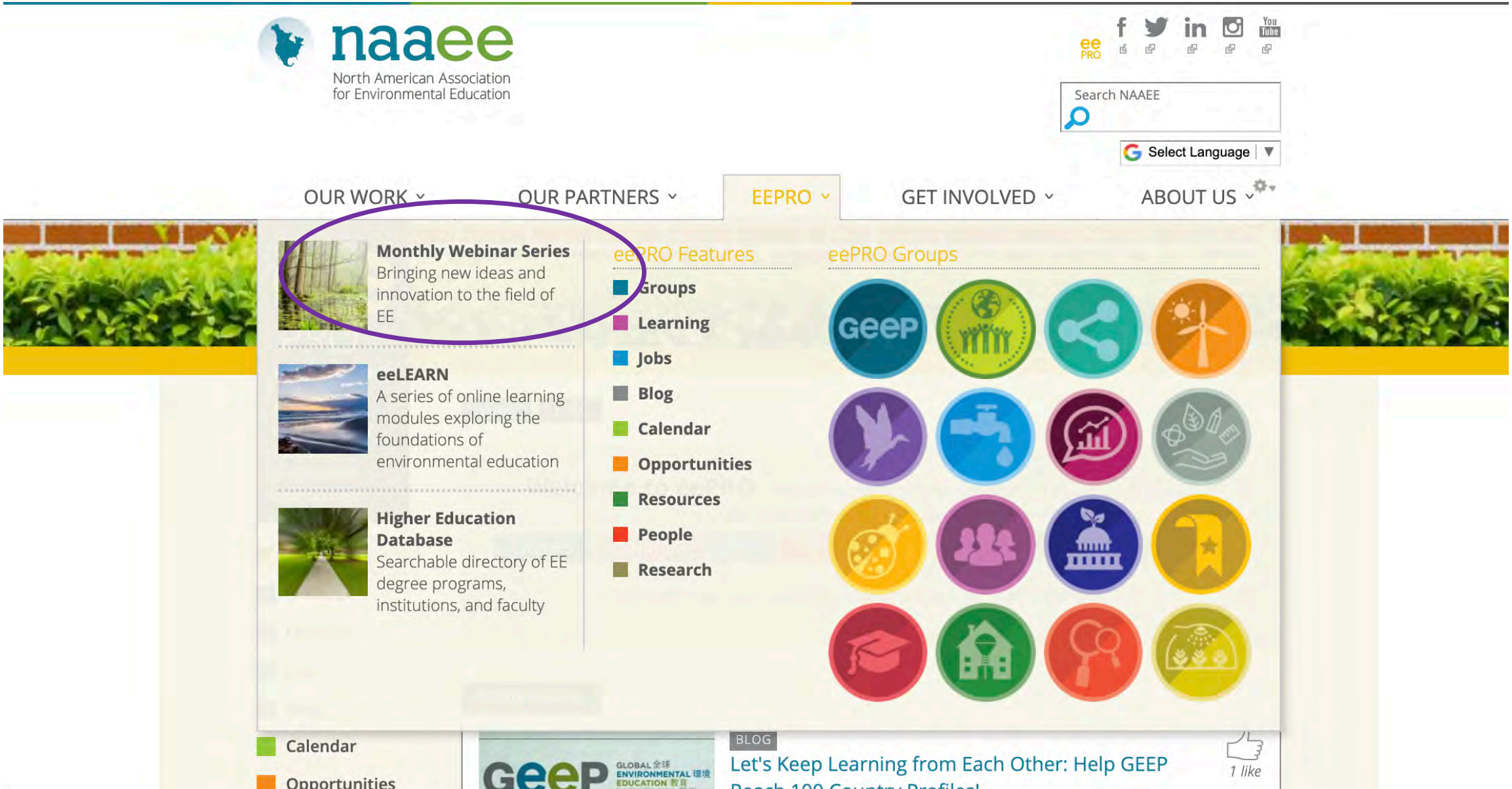
Organization: NAAEE

BY ANNE UMALI | AUGUST 25, 2020

Thursday, September 10, 3-4 PM ET

What does research say about promising approaches to online EE programs? Our team will share results from a systematic literature review conducted to identify what approaches appear to work best for virtual EE field trips and activities. Learn about evidence-based design principles that can be integrated into your fall programs.

naaee.org/eePRO



Upcoming Webinars
September 22, 2-3 PM ET

With Martha Monroe, UF; Louise Chawla, University of CO; and Gabby Salazar, UF

1 LEARNING HOUR

Webinar: A New Guide to Help You Assess Connection to Nature

Are you interested in understanding the dimensions of your audiences' relationships with nature? Do you need to demonstrate to funders that your programs increase learners' connection to nature? A new guidebook can help you measure this elusive concept with young children, teenagers, or adults. This webinar will introduce you to the guidebook and the 11 assessment tools it features. A pdf of the Guide is free at NAAEE's Publication site. Join Martha Monroe, Louise Chawla, and Gabby Salazar for this relevant and helpful webinar!

Date and Time:
Tuesday, September 22, 2020, 2:00pm to 3:00pm

NAAEE International Conference

NAAEE Is Going Virtual This Year!

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Great Line-Up of Speakers and Presenters

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Thanks so much!