Be brave enough to start a conversation that matters.

Welcome to Today’s Webinar
Welcome!
We’ll Get Started Soon.

“If we teach today as we taught yesterday, we rob our children of tomorrow.”

John Dewey, Democracy and Education, 1916
Welcome

Please enter your 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!

We all should know that diversity makes for a rich tapestry, and we must understand that all the threads of the tapestry are equal in value no matter what their color.

— Maya Angelou —

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!

“Technology will not replace great teachers but technology in the hands of great teachers can be transformational.”

George Couros

Please enter your name, organization, and where you are from in the chat box.
Excited about Today’s Webinar
Design Principles for Online EE Programs

I'm bored!

Is there cake left?

I love this--

I'm bored!
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.
So many of us were not prepared to shift everything online! It happened almost overnight!

“Memo to self: ‘Feathers?’”
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.

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.
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?

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

# Empirical studies

## Live interpretive programs

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


## EE field trips (grades 5-8)

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


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

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)
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.

“The Champion Chub” video

Photo credit: Rick Swart
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

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

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- Participant interaction
- Autonomy
- 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 tweaking 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.
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
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!
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?
Webinar: Design Principles for Online EE Programs

Hours for Learning Activity: 1 learning hour
Date and Time:
Thursday, September 10, 2020, 3:00pm to 4:00pm
Organization: NAAEE

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.
Upcoming Webinars
September 22, 2-3 PM ET
With Martha Monroe, UF; Louise Chawla, University of CO; and Gabby Salazar, UF

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!
Hope Many of You Can Join Us in October
We’ll have almost 400 sessions available on demand for a year!

conference.naaee.org
Great Line-Up of Speakers and Presenters

conference.naaee.org
Thanks so much!