Thinking Outside: Design Principles for Online EE Programs

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Marc J. Stern, Virginia Tech
Bob Powell, Clemson University
B. Troy Frensley, University of North Carolina Wilmington

Link to the recording: https://youtu.be/YQts5RWeU7Q

Visit the webinar page to view the slides, notes, and the recording: https://naaee.org/eepro/learning/webinars/webinar-design-principles-online-ee

Highlights of the chat transcript:

Let us know who you are and where you’re from.
- Rachele Brown from Feiro Marine life Center in Port Angeles, WA
- Michelle Youngquist, PLT, Idaho
- Jamie Repasky from Oregon Metro Regional Government,
- Elizabeth Lee, Lake Champlain Maritime Museum, Vergennes, VT
- Gabrielle De Meillon, Rhode Island Division of Fish and Wildlife Outreach Program
- Julia Fregonara with the Nisqually River Foundation in Olympia, WA
- Jason Robertshaqw, humid Sarasota, FL
- Hey everyone! I am Chrissy Cochr - education specialist and ambassador animal coordinator at the WNC Nature Center, Asheville, NC
- Lisa Ward, Toronto, Ontario, Canada, Toronto and Region Conservation Authority
- Jason Robertshaqw, Mote Marine Laboratory
- Kimberly Clark from Asheville NC- Former Zookeeper and Science Museum educator- staying in the loop for the future
- Rosie Wilson-Briggs (she/her) with the Environmental Science Center in Burien, WA
- Cheyenne Palmo, Olympic Coast National Marine Sanctuary, Port Angeles, WA
- Katey Nelson, Annapolis Maritime Museum & Park in Maryland
- Kate Ward, Pinery Provincial Park, Ontario, Canada
- Hello! Lisa Eadens with the Colorado Alliance for Environmental Education
- Hello! Holly Morin, Inner Space Center (University of RI, Graduate School of Oceanography)
What have been your biggest online learning/education challenges?

- Sarah Falkowski: Reaching JEDI audiences
- Candyce Johnson: Slow moving internet; & computer freezes; heavy video
- Bob Powell: Active engagement is challenging but we have seen great examples of ways to do it!
- Marc Stern: This work was sponsored by NAAEE. Always supporting important work!
- Bob Powell: Many of the active programs have challenges and tasks that require students/participants to do something (often together) so also promoting social learning
- Marc Stern: Different platforms allow for different forms of interaction -- ranging from direction to go outside and do something to direct question and answer or autonomous exploration of a virtual space.
- Bob Powell: Some of the programs we reviewed were based in NZ!
- Sarah Johnson: I would imagine these design principles are relevant to all learners, not just k-12.... thinking about designing adult education too
- Ana Leirner: Yes, I agree Sarah. I think it does!
- Marc Stern: I think so, Sarah, good point, but their application might look different of course.
- Sarah Johnson: Model My Watershed is an incredible tool... I use it regularly... highly recommend it!

What do you see in these images?

- Claire Fackler: receding glacier
- Trevor Christianson: Glaciers have shrunk overtime
- Jason Robertshaqw: More color in the last one
- Candyce Johnson: receding of ice
- Bridget Prescott: melting glaciers
- Nora DiChiara: glacial retreat
- Lisa Maloney: The glaciers are melting!
- Sarah Johnson: the white snowy glacier is much smaller in the 2006 photo
- Stacey Heffernan: smaller glacier
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- Thea Van Goor: The ice is receding...
- Global climate change
- Bridget Prescott: climate change
- Nora DiChiara: humans
- Elizabeth Lee: These are all inferences, but there isn't actual evidence...
- Marc Stern: Right! The program around this would have to connect the dots!
- Sarah Johnson: @Elizabeth - good point... there’s a lot of work that would need to be included when teaching with images like this

Design Principles

- Marc Stern: Great points. None of these principles will stand on their own.
- Bob Powell: Yes, all principles are components of a more successful program.
- Sarah Johnson: sounds like the Learning Cycle...
- Marc Stern: Yes. We've been examining Kolb's experiential learning cycle in all of our recent work. The question for everyone would be whether you can (in your specific context) complete the learning cycle within a single program, or whether that program needs to be embedded within a broader set of engagements.
- Trevor Christianson: Beetles has a great learning cycle [http://beetlesproject.org/resources/for-program-leaders/teaching-and-learning/the-learning-cycle-explained-3/](http://beetlesproject.org/resources/for-program-leaders/teaching-and-learning/the-learning-cycle-explained-3/)
- Jason Robertshaqw: A list of research resources available here: [https://www.cilc.org/Resources/Explore-Research.aspx](https://www.cilc.org/Resources/Explore-Research.aspx)
- Eileen Merritt: Glad so many of you are fans of Robin Kimmerer too!
- Marc Stern: Yes, Emily! Absolutely. The passion of the educator always seems to float to the top in our empirical work.

Platforms, Tools, & Resources

- Jamie Repasky: Group sticky note discussion on Google Jamboard works great!
- Marc Stern: I use breakout rooms regularly in Zoom.
- Mary Gannon: I absolutely LOVED "Gathering Moss." Such a beautiful book with great narration.
- Jason Robertshaqw: We use Flipgrid a lot as a follow up to our online programs [https://flipgrid.com/seatrek](https://flipgrid.com/seatrek)
- Marc Stern: We've seen many groups using Flipgrid successfully.
Eileen Merritt: Jason- I have found Flipgrid to be useful, too.
Jamie Repasky: https://jamboard.google.com/
Marc Stern: We've seen student contests lead to positive outcomes in online EE programs too.
Eileen Merritt: Emily- Yes, student-designed artifacts/projects is a great way to allow student autonomy.
Elizabeth Lee: Games like kahoot can be really engaging for kids and give real-time formative assessment.
Marc Stern: Our systematic review focused on K-16 (kids through late adolescents). However, I'd posit that many of these same principles could be adapted to adult audiences.

Questions for the speakers:
Sarah Johnson: did you all look into the effectiveness of online learning in higher education frameworks? curious to learn more from that world
Kelley Anderson: Did you find any evidence to suggest attention span may be shorter or longer in an online environment vs outdoors? How would this influence the structure of an online program?
Marc Stern: We did find an article suggesting that attention span drops precipitously online after about 9 minutes. Change it up when you can!
Marc Stern: We have read quite a bit about university level education. The outcomes overlap, but are often a bit different from environmental education programs. Therefore, the lessons are a little different there.
B. Troy Frensley: Yes Elizabeth! Game-based approaches with feedback (e.g., badges, rewards, points) can be effective. One study had students making choices on invasive exotic species in a wetland through a game. Students could dive underwater, see the changes, etc.
Eileen Merritt: Sarah- We did not include those in this review. We wanted to focus on K-12 since most of our work focuses on those ages.
Jamie Repasky: Tips for effective educational videos - https://cft.vanderbilt.edu/guides-sub-pages/effective-educational-videos/
Biret Adden: Have you uncovered any indications about how approaches might have to differ for younger vs older students? Is there evidence that this can be effective for both?
Ana Leirner: Will the learning network be focused on K-12 students? Or also educator PD?
Eileen Merritt: This particular network is focused on grades 5-12.
Marc Stern: Learning networks are focused on ages 11 and up (5th grade and up).
Mollie Behn: All the distance learning tools (flip grid, pear deck, jam board, etc) are amazing yet could be challenging for K-2 students to either use or interact with. What DL peer interaction practices have you seen that work best for our younger learners?
Marc Stern: The learning network would involve existing programs.
Jane Hurley: love the idea of learning Exchange!
Anne-Marie Runfola: for formal education only, or for informal?
Marc Stern: Both.
Jamie Repasky: How does any organization sign up for the learning exchange?
Marc Stern: If you are interested in the learning exchange, please email Eileen. egmerritt@vt.edu
Marc Stern: Our work primarily focuses on ages 10/11 and up. We don't have much evidence regarding younger kids. Sorry!
Candyce Johnson: Yes, a compilation of tools would be awesome
Nora DiChiara: Thank you! This is great. Yes, very interested in a learning exchange also.
Gabrielle De Meillon: I would definitely be interested in learning more about the pros and cons of online tools
Mary Gannon: What do you suggest for virtual field trips?
Elizabeth Lee: I would like to see each of the tools demonstrated, not just compared by their features.
Marc Stern: I recommend nuhop because the platform is super simple, and the possibilities are very broad. https://nuhop.org/outdoor-education. If you play around on this website, the structure is interesting and has high potential. I'm less familiar with the specific content they share.
River DiLeo: we do a windowsill nature journaling lesson in NYC - no backyards here but it works well!
Bob Powell: Everyone should check out Nina Simon's work
Kayley Fowler: https://johnmuirlaws.com/journaling-curriculum/
Sarah Johnson: teaching online using so many of the cool tools, I'm getting so much ‘data' from student activities; data that I've never had before
teaching online. Any suggestions on what to do with that ‘data’ that would actually be useful?

- Kayley Fowler: Thanks everyone for all the amazing resources and ideas!
- River DiLeo: I would love an event where we are briefly introduced to different online learning platforms.
- Elizabeth Lee: How are you defining outcomes across ages?
- Lauriel Amoroso: When you were looking at successful online EE programs, were you using your prior research on EE Outcomes as the measure?
- River DiLeo: I love making content on tiktok for students. Super accessible on their phones because many students don't have laptops.
- Lauriel Amoroso: The EE21 is a great resource! Thank you for creating it.
- Anne-Marie Runfola: glad to know we're in this together and learning and sharing. We'll be more resilient and flexible and hopefully reach and serve larger, more diverse audiences
- River DiLeo: Thank you all! This discussion was really fantastic.
- Nora DiChiara: This was very helpful, and inspiring. Keep up the great work everyone!
- Marc Stern: Yes! We will keep in touch through NAAEE and other ways as well. You may be sick of us by the end of this!
- Judy Braus (she, her): Thank you all so much! And thanks for the great discussion in the chat! Great closing thoughts!
- Lisa Maloney: Thank you so much for sharing your research findings and for the encouragement as we go into this next school year!! :)
- Elizabeth Lee: Thank you to for reading all those studies! Very affirming to know we intuitively have come up with design that includes a lot of the high-impact elements.
- Eileen Merritt: Thanks for your engagement, thoughtful questions and resources that you all shared!
- Bob Powell: Thanks everyone!
- River DiLeo: Yes! I feel like remote learning helps me build better relationships with students. I can see their homes, their preferred pronouns, their pets. Virtual learning has been a really great opportunity.
- Shannon Holton: Best webinar I've done so far. Thank you!!