



# Working Together While Apart

*Bringing extracurricular environmental and STEM activities to online education*

By **Aislinn Benfield**

**W**HEN I WROTE “POLLINATING HOPE”<sup>1</sup> in the Fall 2019 issue of *Green Teacher*, there was no way I could have foreseen that the world would change unimaginably in the next six months, taking with it my view of delivery and priorities in education and extracurricular activities. At the time, I was happily basking in the success of my extracurricular environmental club’s native plant pollinator garden, which we had added to our local community the prior spring. I was excited to see what opportunities the 2019–2020 school year would bring for the club in the larger community. Looking back now, it’s almost hard to believe that only a year and a half has passed.

Like many teachers, my brick-and-mortar school moved in the spring of 2020 to remote and, eventually, hybrid delivery. And like many teachers, I was at first frustrated and overwhelmed by the abrupt switch in educational methods and the departure from everything I was familiar with in my teaching career. But I dutifully persisted and eventually came to appreciate the flexibility and possibilities of online

learning, to the point that I made the decision to change jobs and teach online permanently.

Moving to Reach Cyber Charter School was undoubtedly the right choice for me. I have been able to embrace creativity in new ways and grow professionally. And once I settled into a new method of remote teaching and communication, I decided to try implementing extracurricular environmental activities in this new format. At first, this seemed like a daunting challenge, especially since my previous approach to environmental activities focused on hands-on, group projects. Reach Cyber Charter School covers the entirety of the state of Pennsylvania and my students live anywhere from an apartment in Philadelphia to a farm in one of the rural counties. Clearly, a challenge in the implementation of any extracurricular organization would be adjusting to this format. Reach is a STEM-focused school and implements STEM into curricula and extracurriculars, including a STEM camp program. It was natural to use this forum for my environmental program, and with the STEM camp coordinator’s help, I was able to quickly market and implement it. The environmental STEM camp that I started is open to sixth- to twelfth-grade students; however, a similar approach

would work for younger students with some modifications. It was up to me to decide how to bring the concepts of real-world environmental action to far-flung adolescents as diverse in location, background, and demographics as is Pennsylvania itself. I am including a few specific examples of projects that I used with my students, but the overall concept could be applied to many environmental activities, by dividing them into components of individual action as well as synchronous and asynchronous online communication.

## STEM and environmentalism

In my experience and research, extracurricular environmental organizations do not usually have an experimental focus; however, having far-flung students working in their home settings creates an *ad hoc* natural laboratory, allowing for easy incorporation of STEM concepts and the scientific method. The fact that each student works in their own environment presents a basis for comparison among conditions, lending itself perfectly to using the scientific method for exploring environmental action. The varied circumstances of the students' living environments allows for a natural (albeit not necessarily controlled) experiment to be conducted. And while our data wouldn't pass the scrutiny of a peer review board, it is a valuable lesson to the students that science is found in everyday settings, indeed in their own homes. This realization can make science less intimidating and more relatable and even lead to increased interest in the STEM fields.<sup>2</sup>

To create activities that can be carried out individually and shared online, I took projects from previous clubs and adapted them to fit remote learning and a STEM model. For example, my native plant pollinator garden became an experimental native plant/recycled container garden. Reach provided students with seeds and seed-starter mix, but students were responsible for sourcing recycled materials for containers and choosing a location for seed germination. They are keeping records of the details surrounding seed germination and resulting plant growth and sharing them with the camp using online programs such as Padlet. Will native pollinator plants best proliferate in a recycled coffee can on an apartment balcony, a suburban backyard, or adjacent to a dairy farm? The environmental STEM camp will find out!

## Creating community online

The camp has been active for only a few months (at the time of writing) and continues to evolve. We meet synchronously once a week using Adobe Connect or Zoom and communicate asynchronously using shared Google files, Padlets, and other web-based programs. Creating a cohesive group in a virtual world is an objective of any online learning program and the extracurricular environmental STEM camp is no exception. One way to create cohesion is a group project. Creative growth, collaboration, and social interaction facilitated by group work are vitally important in remote learning.<sup>3,4</sup> This spring, the Environmental STEM Camp produced two "Reduce, Reuse, Recycle" Earth Day presentations for the elementary school, for Grades K–2 and 3–5. The high school and middle school students in the camp worked together to create two slideshows with Google Slides, which were presented to the elementary school students over Zoom. Through these slideshows, students defined and explained the terms and importance of "Reduce, Reuse, Recycle" in language appropriate for the intended audience. Camp students presented this information over Zoom to audiences of around 500 per assembly. After introducing the concepts, they provided easy, everyday examples to encourage children to participate in waste-reduction practices and led the group in a craft (upcycling cardboard tubes into a desk organizer). To conclude the assembly, selected elementary school students were unmuted and asked questions of the older students in a Q-&A session. The entire camp contributed to the final product through work in small groups, each with a specific task, such as background research, presentation creation, and craft coordination. A cross-age presentation provided the opportunity for students to develop communication and leadership skills, requiring not only comprehension of the content, but the ability to express it to younger students. Group and role rotation enabled collaboration among students of different ages, genders, learning styles, and academic needs. By monitoring each group's communication and products, I constantly evaluated the efficacy of groupings and made changes to gently motivate and to encourage social bonds.

Other interactions were purely social; for example, in a synchronous session, a conversation about pets turned to a quick decision on my part to create a shared "Pets" Padlet,

which, although it deviated from the camp's overall mission, added to the sense of shared interest and friendship among the group. Since this was an extracurricular activity and the students were voluntarily participating, it was important to keep a balance between work and fun.

## Overcoming barriers

One of the most beneficial aspects of an online extracurricular program (indeed, of online education in general) is customization to individual students, and this is a particular strength of Reach Cyber





Charter School. Reach prioritizes meeting individual students' needs, academic and otherwise, and enables student participation in course work and extracurriculars by providing supplies and even offering stipends for high-speed internet access.

The Environmental STEM Camp includes collaboration as one of its major focuses. The combination of attention to individual needs and applying innovative methods of collaboration helps overcome barriers to traditional participation, including medical, social, educational need, even geographic barriers. Having taught in both urban and rural (and large and small) districts throughout the state of Pennsylvania, I am aware of the varied availability of extracurricular opportunities by location. An online extracurricular club removes these barriers by serving all students, regardless of location, special education status, or other need. Projects are executed individually, allowing students to participate from their own location, at their own pace, and with any necessary modifications or accommodations. It is easy to customize the projects for each student, since they are all working as individuals; by sharing their results, each student is also part of a larger group.

One of the benefits in an extracurricular group is bringing together students of different ages but similar interests. This is possible in an online camp as well, through collaborative group projects (as previously mentioned) and in breakout rooms. Breakout rooms, a feature of many online meeting and presentation tools, allow students to work together in small groups as subsets of the main meeting. They can interact through a chat program or by using the camera and microphone. Many teachers, myself included, place students in groups based on complementary strengths and areas of needs (academic and social) for coursework; in an extracurricular cross-age camp, there is even more opportunity for cooperative student activity. I make a point of matching high school and middle school students, shy and outgoing students, and students with research or writing strengths with those who need more support. A particularly interesting dimension is added by the geographic and demographic diversity of the camp. In most brick-and-mortar schools, the students are from a geographically similar area and may tend to be demographically similar as well. Reach Cyber Charter School, encompassing the entire state of Pennsylvania, has a truly diverse student population. Members of the Environmental STEM Camp hail from varied locations throughout the state, and I can see the students learning from each other through conversations and the sharing of experiences. Student survey data rated social interaction as an important part of the camp, even exceeding their expectations.



Although the future of education will undoubtedly continue to evolve, remote learning is here to stay, even in brick-and-mortar settings.

Extracurricular, environmental, and STEM activities, while seemingly difficult to facilitate in an online setting, can be successfully implemented and even combined. While not without challenges, I have been able to create a camp with hands-on individual and collaborative group activities. And as more students turn to online education, either temporarily or permanently, new adaptations of both extracurricular activities and nature-based activities

will be necessary. But the Environmental STEM Camp has shown that with some creativity, encouraging stewardship in students through remote learning is possible.

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