Interdisciplinary experiential learning during COVID-19: lessons learned and reflections for the future

Megan Butler¹

Accepted: 16 November 2021 / Published online: 6 January 2022
© AEES 2021

Abstract

Environmental education enables students to critically analyze their impact on the world while producing environmentally knowledgeable and engaged global citizens with the skills and motivation necessary to participate in developing and implementing solutions to societal and environmental challenges. Beyond facilitating student learning, experiential learning opportunities that allow students to interact with the natural environment can also help facilitate students' overall well-being and resilience. Although the nature of the COVID-19 crisis acts as a barrier to hands-on learning, during this unprecedented time, the benefits of experiential environmental education are more needed than ever. Lessons learned from creative adaptations to COVID-19 highlight the value and resilience of experiential and interdisciplinary learning models. As the pandemic continues, it is increasingly important to share these lessons learned from efforts to safely provide hands-on experiential education opportunities. This paper shares the experience of the Oregon Extension, an undergraduate study away program based out of the Cascade-Siskiyou National Monument in Southern Oregon that successfully adapted field-based environmental education programming during the COVID-19 pandemic. The paper describes the Oregon Extension Program and adaptations made during COVID-19. It then provides a set of reflections and lessons learned regarding adaptations to COVID-19 and implications for environmental education beyond COVID-19.

Keywords COVID-19 · Experiential learning · Environmental education · Adaptation · Resilience

Introduction

There is growing pedagogical recognition of the value of field-based hands-on environmental education opportunities. Environmental education enables students to critically analyze their impact on the world (Jickling and Wals 2008) while producing environmentally knowledgeable and engaged global citizens with the skills and motivation necessary to participate in developing and implementing solutions to societal and environmental challenges (Cockerill 2013). Environmental education is also characterized by the use of participatory methodologies, an emphasis on experiential learning focusing upon direct contact with nature (Cockerill 2013), and the utilization of interdisciplinary problem-solving approaches (Pavlova 2012). Pedagogies that allow for interaction, collaboration, and experimentation help

facilitate student enjoyment and allow them to learn and retain more information (Johnson et al. 1998; Tarrant and Thiele 2014).

Beyond facilitating student learning, experiential learning opportunities that allow students to interact with the natural environment can also help facilitate students' overall well-being and resilience. Advocates for experiential environmental education assert that the health and well-being of students depend upon their ability to gain hands-on experiences in nature and that these interactions enhance students' propensity to understand and care for their natural environment (Loynes 2012). In addition, both the increasing popularity of nature-based therapy (Oh et al. 2020), as well as a growing body of academic research (Capaldi et al. 2015; Dillman-Hasso 2021; Kaplan and Kaplan 1989; Tillmann et al. 2018), demonstrate the connection between access to nature and mental health. The connection between well-being and time spent to nature is also reflected in both literature (Louv 2008, 2012; Lumber et al. 2017; Mayer et al. 2009) and recreation program efforts to improve access to green space (Mendez 2017).

✉ Megan Butler
Mbutler3@Issu.edu

¹ Conservation Biology Department, Lake Superior State University, Sault Ste Marie, MI, USA

Over the past year, the spread of COVID-19 has presented unprecedented challenges to academia. Social distancing guidelines implemented to delay the spread of the virus have required educators to adapt their approaches and have resulted in an increase in the use of online teaching platforms and distance learning. Although online programs can supplement educational opportunities by providing access to diverse stakeholders and information, they also act as a barrier to hands-on learning and reduce opportunities for students to learn and build important skill-sets through direct communication and interactions (Tarrant and Thiele 2014). Concerningly, the skills that students will need to navigate the challenges of global insecurities in the twenty-first century (such as climate change) may be the very skills increasingly at risk during COVID-19 as academic institutions move into isolated online learning environments. At the same time, COVID-19 has put unprecedented strain on the mental health and well-being of students (Bartlett et al. 2020; Rios et al. 2021).

Several authors have also pointed out that the COVID-19 pandemic has added to existing unresolved environmental justice concerns. Such concerns include inequitable access to greenspace (Rios et al. 2021) or the proposed Keystone XL pipeline across indigenous land (Rodrigues and Lowan-Trudeau 2021). The added stress of the pandemic has strained the capacity of vulnerable communities (and the students and educators from them) to remain resilient in the face of these existing challenges (Rodrigues and Lowan-Trudeau 2021). At the same time, incidents such as the death of George Floyd in Minneapolis Minnesota have catalyzed visceral global responses and highlighted the need for deep reflection. These phenomena have fueled calls for more justice-centered environmental education that opens spaces for alternative ways of knowing and critically analyzes the justice implications of dominant environmental paradigms (Martin 2020; Forsythe and Chan 2021; Rodrigues and Lowan-Trudeau 2021). Some have speculated that informal and alternative learning opportunities provide hope for addressing such daunting challenges (Rousell and Chan 2021).

Although the nature of the COVID-19 crisis acts as a barrier to hands-on learning, during this unprecedented time, the benefits of experiential environmental education are more needed than ever. It is a challenge for educators in a wide variety of fields to figure out how to provide educational programming while ensuring safety and security and providing a sense of normalcy. As the pandemic continues, proponents of experiential environmental education have identified creative ways for keeping learning hands-on. In this challenging context, experiential opportunities may be key resources that help promote resilience. Recent articles about other experiential programs have highlighted the opportunities such programs provide to promote resilience

in the times of COVID-19 by decreasing social isolation; improving engagement; nurturing key developmental relationships; and championing youth agency through education, leadership, and service opportunities (Arnold and Rennekamp 2020; Quay et al. 2020).

Lessons learned from creative adaptations to COVID-19 highlight the value and resilience of experiential and interdisciplinary learning models. As the pandemic continues, it is increasingly important to share these lessons learned from efforts to safely provide hands-on experiential education opportunities (Calvert and Janeiro 2020; Quay et al. 2020). This paper shares the experience of the Oregon Extension, an undergraduate study away program that successfully adapted field-based environmental education programming during the COVID-19 pandemic. The paper then provides some lessons learned based upon faculty and student surveys as well as a faculty debrief workshop conducted at the end of the semester. The author of this manuscript was a visiting professor with the Oregon Extension during Fall 2020 and received permission from the program to share these insights.

Sharing these lessons provide value beyond facilitating adaptation to the current COVID-19 pandemic. Several scholars have also recently pointed out similarities between the climate crisis and COVID-19. Such similarities include the role of uncertainty, the lag time between prevention measures and societal benefits (and the difficulty in perceiving societal benefits such as avoided sickness or avoided natural disasters), the need for international cooperation and potential free-rider problems, political barriers to early interventions, and inadequate policy measures (Schmidt 2021). Scholars are also increasingly drawing a link between climate change and mental health (Dillman-Hasso 2021). Because of these similarities, lessons learned from our adaptations to COVID-19 may provide important insights about how to deal with problems such as climate change (Schmidt 2021).

The following sections will provide some important background information about the Oregon Extension (OE) program, describe adaptations the program made to ensure safe in-person operations during Fall 2020, highlight key lessons learned from OE faculty and staff, and discuss implications for environmental education programs during the era of COVID-19.

The Oregon Extension

The Oregon Extension (OE) is an accredited semester-long domestic study-away program based in the Cascade-Siskiyou National Monument in Southern Oregon at the intersection of the Cascades, Klamath, and Siskiyou bioregions. The program has been in operation for the past 47

years. The campus is in the middle of a wilderness, and students live in cabins that were built in 1929 to house the families of lumber mill workers. The program focuses upon providing a meaningful interdisciplinary experience for students interested in living in an intentional community setting, getting closer to the land, and working on in-depth academic projects. OE's mission is to invite college students to live a simplified life in a rustic forest setting in which time, space, and the curriculum allow for deepening their intrinsic love of learning, gaining exposure to agrarian and forest practices of sustainability, and encouraging the knitting together of their own, personal integrated vision of life. The OE is not alone in this mission (Jones et al. 2010).

The OE mainly draws students from small Christian liberal arts colleges throughout the USA. While OE students have the opportunity to develop a richer understanding of religion during individual research projects, the program draws students from a variety of backgrounds and interests. While the OE provides students with the opportunity study and critically analyze Christian themes, religious study is not a required component of the OE's program. Students take "block" courses—one course at a time for 3 and a half weeks and have limited access to the internet and smartphones. As such, students are given the time to explore new ideas and the space to let these ideas develop without the persistent distractions of social media and the overlapping deadlines of simultaneous courses. During the week, students are assigned a substantial reading load, attend daily lectures, and participate in small group discussions. Students also choose to participate in experiential courses in sustainable forest management, furniture making, nature writing, and sustainable entrepreneurship. Students also get daily hands-on experiences including domestic solar technologies, biochar; organic no-till and hoop house gardening; raising poultry and goats; making bread, cheese, and yogurt; and an assortment of food preservation techniques.

The experiential learning model utilized by the Oregon Extension offers a re-melding of liberal arts and science. The interdisciplinarity of the program makes it applicable and accessible to students beyond the environmental and forestry fields. Students spend time thinking about big questions and tackling wicked problems such as climate change. The scientific component of the curriculum provides students with practical steps that can be used in the solution process. During the arts and humanities focused sections of the curriculum, students reflect upon these steps and discuss their meaning. The need for this sort of learning is nothing new, but it is newly articulated in the face of present challenges such as climate change and COVID-19. Together, the blending of arts and science helps cultivate a sense of hope amidst difficult challenges.

Responding to COVID-19

During the Fall 2020 semester, the Oregon Extension faced the challenge of safely providing an in-person hands-on study away program. The program took several main steps before, during, and after the semester to reduce the risk of COVID-19 transmission. These safety protocols were numerous and covered a variety of bases, but a common theme was calling on the existing community of hands-on learners that is characteristic of the OE community. During the COVID-19 pandemic, the OE called on former students and their various expertise and ability to help, the OE called on incoming students to take leadership roles when appropriate, and the OE called on its small faculty, accessing skills not typically associated with a professor position. In other words, the community aspect enabled the OE to respond adaptively to the stresses and challenges of COVID-19, and the general hands-on ethos of the OE meant that these adaptations were empowered with developed skills, abilities, and communication.

OE's community-focused adaptations can be seen in the program's approaches to food preparation, campus structural adaptations, and on-campus quarantine during COVID-19. For example, the OE implemented a mandatory 2-week quarantine period on campus for all faculty, staff, and students before the semester. A summer COVID-19 Protocol intern helped develop and design the quarantine period on campus. Students arrived 2 weeks before the beginning of the semester and spent those first 2 weeks in tents. Students were not allowed in any OE buildings except for one bathroom and an outdoor shower facility. These facilities were sanitized several times per day during the quarantine period. OE faculty and staff prepared and served all food for students during the 2-week quarantine period. A kitchen coordinator was hired to coordinate meals. All food was eaten outdoors, and six-foot social distancing was enforced through frequent reminders. Afternoon activities were offered and facilitated by students themselves. Students also engaged in daily chores and art activities. After the 2-week quarantine period, all students and faculty received COVID-19 tests. Once all members of the OE community received negative COVID-19 tests, the students, faculty, and staff were able to operate as a family unit or pod per Jackson County Oregon's Health Department regulations. Students were allowed to move into cabins and enter OE buildings once they received a negative test result. The quarantine requirement was based upon Center for Disease Control recommendations.

In addition, although the important role of food in resilience and sustainability education is widely recognized (Elsden-Clifton and Futter-Puati 2015; LaCharite 2016) and a normal component of the OE curriculum,

the role of food as a sustainability education theme was made more explicit as the OE adapted to COVID-19. Milk, cheese, eggs, and fresh produce were harvested prepared and preserved on campus. Food produced on campus was supplemented by weekly grocery trips to town to pick up pre-ordered groceries. Simplicity, self-reliance, and anti-consumerism and the four R's (reducing, reusing, recycling, repurposing) are also topics typically covered at the OE and valued in sustainability education (O'Brien and Howard 2016). The OE's adaptation to COVID-19 also built upon these themes by building rather than buying our way through difficult times. For example, professors and former students built shelters, outdoor bathrooms, and other necessary adaptations using repurposed materials to better ensure social-distancing rules. The OE also constructed an outdoor pavilion for students to use to gather during the semester. To be proactive for students who need such spaces, the OE also provided private spaces for students to use for private therapy and medical sessions.

Methodology and methods: reflecting upon OE's adaptations to COVID-19

After the semester students were asked to fill out anonymous online surveys which included several questions related to COVID-19 safety. Survey questions were open-ended short answer questions. The faculty also sat down to debrief and reflect upon lessons learned regarding the semester's adaptations to COVID-19. After the semester, faculty members were also asked to fill out a survey. The faculty survey also included a series of short-answer open-ended questions asking participants to reflect upon what they felt went well regarding the semester's COVID-19 prevention activities and what could have been improved. Survey responses were analyzed qualitatively, and responses to each question were coded for key themes. Faculty and student surveys as well as the final faculty debrief produced several key lessons learned for the Oregon Extension. These lessons are discussed below.

Lessons learned

The COVID-19 semester brought to light the specific ways the OE's goals manifest to confront and mitigate some of the consequences for higher education for global sustainability challenges.

Lesson 1: it is possible to successfully and safely run an academic study away program during the COVID-19 pandemic

The first thing the OE's experience shows is that it is possible to safely conduct a field-based experiential learning program while taking proper COVID-19 precautions. Using the aforementioned precautions, the OE successfully avoided COVID-19 outbreaks on campus during the Fall 2020 semester. OE faculty/staff reflected that many of these precautions would be helpful in future semesters due to the observed benefits:

Having students who have colds or flu symptoms wear masks while contagious would help prevent the spread of the usual germs that storm their way through the cabins in usual times. Emphasizing hand-washing protocols would be helpful in preventing the spread of germs as well.

OE faculty also reflected that the OE's model of student engagement likely facilitated the successful semester. At the OE, students typically take part in on-campus chores as a team and are encouraged to take leadership roles during on-campus activities. For example, students were in charge or organizing and facilitating entertainment during the quarantine period. Students organized movie nights and facilitated workshops on topics such as painting, yoga, navigating using a compass, and writing. This type of student engagement generates buy-in and a sense of community and ownership within the cohort of students. The community approach and hands-on approach of the OE made it an empowering semester experience. Instead of COVID-19 being about shutting everything down, it became about coming together and building an alternative to isolation, through careful planning and creative play. During the COVID-19 semester when teamwork was needed more than ever, this model of student engagement helped facilitate participation in COVID-19 protocols and the protection of peers on campus.

The Oregon Extension's location was also an advantage that allowed the program's COVID-19 adaptations to be successful. The location of the field school was an advantage. Jackson County Oregon has enjoyed relatively low COVID-19 infection rates throughout the pandemic due to its low population. In addition, the Oregon Extension's isolated location in the mountains helped reduce potential sources of COVID-19 transmission. In addition, the weather typical of August and September at the OE's location within Cascade-Siskiyou National Monument also greatly enhanced the program's ability to adopt a 2-week outdoor quarantine period as an adaption to COVID-19. The lack of rain combined with warm daytime and cool nighttime temperatures made living outside much easier for students. Although geography often matters with outdoor education and not every academic program has the advantage of being located in rural Oregon, the OE may provide an example of how academic institutions can develop and run field-based programs at local field stations connected to campus.

Lesson 2: the value of field-based learning during uncertain times

In the end of the semester surveys, students almost unanimously expressed the opinion that the opportunity to attend in-person field-based courses was superior compared to taking courses online at their home campuses:

This was the best semester of my college career and I am immensely grateful to have had it during this time. It was so much more meaningful to be in close contact with this community than to learn online. I had the best time of my life meanwhile my friends had a terrible semester on campus where community/campus life was shot and classes were miserable either online or with masks.

Many felt that they were able to learn better in the environment provided by the OE compared to online learning:

To be able to get away from the stress and fear of it all, and to be able to interact with everyone so closely means the world to me. I think each and every one of us here knew how lucky we were to be with each other and so we all made the best out of it! I did not like online learning at all, so being able to have a semi-normal semester with in-person lectures and discussions was awesome. I was able to learn so much.

Being here and not online was amazing. I feel so blessed that I was able to learn so much during the semester. If I was online, I don't even think I would have learned half as much as what I learned here. This was truly the greatest semester of College for me, and the only way I can imagine spending a semester during COVID.

Students also emphasized the value of being able to learn in close contact with a community engaging in hands-on learning and indicated that the program allowed them to focus upon their educational goals and find relief from the constant stress of the pandemic:

I was so grateful to be here, it was wonderful to have the chance to step away from all that chaos and focus on learning.

Lesson 3: challenges can become opportunities to build community

During faculty reflections about the COVID-19 precautions during the semester, several activities that were originally planned as necessary precautions had unexpected benefits. For example, in general, both students and permanent faculty commented on group cohesion during this semester. As one permanent faculty member explained:

The students seemed really close together (always true, but seemed really exceptional this past year).

Due to the benefits seen with group cohesion and safety, several of these activities will likely continue into future semesters regardless of the status COVID-19 pandemic.

For example, both students and faculty highlighted the value of the 2-week quarantine period before the semester. The 2-week camping period helped promote safety, and it also allowed students to get to know one another. Sharing meals as a community and requiring students to spend time outside helped to facilitate community cohesion. Students highlighted the quarantine period as a positive highlight of their semester due to the ability to explore campus and get to know each other before the beginning of classes:

It was awesome, we got to know people before the pressure of academics started and broke the ice so discussions were authentic right away.

I loved the quarantine period so much, I think it was what made us all so close right away. I think you should continue to do something like that were students come before classes.

This 2-week period went so well that it is likely that we will continue to offer a 1-week camping period prior to the beginning of classes to students in future years.

Another change in the curriculum that will likely continue is the number of trips off campus that students take. Although in a normal year students have more interaction with individuals off-campus, limiting activities to those that could be done within the COVID-free bubble created by the quarantine period was effective at spreading the spread of COVID-19 on campus. Fewer trips to town also helped students creatively identify new activities to do with one another on campus such as more hikes, talent shows, pot-lucks, and other fun groups activities. It also opened more opportunities for on-campus bonding and limited rifts that normally form between students that were over and under 21 years of age. As one faculty member explained:

I really enjoyed the sense of unity and inclusion in the student body that seemed to result from staying on campus versus going into town. Once in town, the whole group cannot typically go to the same venue because of space or group size limitations. Also, once in town, students go in different directions based on interests and budgets. More open mics resulted from the extra Friday nights on campus. I would like to figure out a way to have a couple of weekends in the month campus based and the others town based.

Overall, the OE's experience adapting to COVID-19 provided several encouraging lessons learned for the program. The student survey reflected OE participant's appreciation

for the opportunity to engage in hands-on, in-person learning especially after spending the previous spring adapting to learning online at home. In addition, the surveys helped to highlight the fact that not only were the OE's adaptations effective at preventing the spread of the COVID-19 pandemic on campus, but several were also valuable additions that helped the program cultivate a strong sense of community and positive campus culture. Beyond the practical applications of these findings for the Oregon Extension and similar programs, this case also provides several important insights for higher education in the era of the COVID-19 pandemic.

Lessons learned for higher education

This case study analysis of the Oregon Extension Fall 2020 semester provides some broader lessons learned for higher education.

Lesson 1: the same skills we want students exposed to are the skills we need as a faculty and staff to achieve experiential learning in these challenging times

The Oregon Extension's experience adopting COVID-19 protocols also highlights the need for flexibility and strong team communication. OE program staff met weekly and adapted programming and procedures based upon changing circumstances and needs. For example, hiking trips in a nearby state were canceled and replaced with local activities over a day due to new state lockdown travel restrictions. Authors from Missouri Extension echo the need for flexibility and safety focus as well as the need to innovate and adapt plans to ever-changing circumstances and needs (Arnold and Rennekamp 2020).

The ability to engage in adaptive learning to approach daunting challenges with an attitude of informed hope and the ability to collaborate and communicate on diverse teams are all skills that have also proven to be invaluable during COVID-19. The importance of these skills for has been echoed by a recent articles highlighting how environmental educators worked to adapt to the challenging circumstances posed by the pandemic (Román et al. 2021; Quay et al. 2020; Arnold and Rennekamp 2020). From educators in the Galapagos building resilience through strengthening social networks (Román et al. 2021) to school administrators reflecting upon the importance of planning for uncertainty, practicing empathy, communication, and making touch decisions during the COVID-19 pandemic (Quay et al. 2020), these articles reinforce the importance of developing and practicing these skills.

As environmental educators, these skills that have proven so necessary during the COVID-19 pandemic are

the same skills that we are hoping to instill in our students. As Tarrant and Thiele (2016) explain: "The mandate of sustainability education, beyond the transmission of crucial data and knowledge, is the transformation of students into lifelong learners who embody critical thinking and systems thinking skills and advanced communication and collaboration skills." Lessons learned from our experience with adapting to COVID-19 will likely be valuable for informing our teaching in the future. The skill sets that we have honed as educators during COVID-19 are the same skill sets that young people will need as they address wicked environmental challenges such as climate change.

Lesson 2: online learning cannot replicate the educational and community-building value of in-person, hands-on experiential learning

Online learning has been seen as a necessary adaptation during the COVID-19 pandemic. However, those interested in promoting online learning and its associated learning technologies are ready to look at the brighter side. This turn to the "positive" side of COVID-19's disruption in learning is best illustrated in recent reports suggesting that some students now respond positively to online learning and are more interested in taking online courses in the future (McKenzie 2021). As such, many institutions might consider continuing to offer online learning via computer even after it is safe to continue in-person learning.

At the same time, the experience of the Oregon Extension teaching in a hands-on experiential program during COVID-19 suggests otherwise. Firstly, student opinion of the hands-on experiential learning model demonstrated in a more dramatic and exceptional way (than a typical semester) their perceived benefits to this pedagogical approach, given the fact that everywhere else their friends and peers were online, at home, isolated, while our cohort of students was still able to experience the full benefits of in-person learning.

Although online learning provides opportunities for safety, flexibility, and access to diverse stakeholders and information at the click of a button, it is important to consider what we might lose in the transition to teaching online. As one environmental educator explained in a recent article published in *Journal of Outdoor Environmental Education*:

But things in this virtual learning world are not quite right. There's no joy of learning. There's no 'light-bulb' moments nor witnessing of awakening when skills, knowledge and experience all come together to offer real life learning. It lacks the constant dialogue, chatter and jousting of ideas, the growth, support and care. These couldn't penetrate the firewalls of our online worlds. (Quay et al. 2020 p. 94)

While the growth of online learning during the pandemic has been necessary and has even created new educational opportunities, practitioners of field-based environmental education recognize that losing the opportunity to conduct hands-on collaborative activities poses (Quay et al. 2020).

The surveyed opinions and reflections of our faculty members also highlight the value and resilience of experiential and interdisciplinary learning models and offer insights about how to deal with future crises and the problems accompanying climate change. The skill sets that have proven to be so important for building resilience and addressing global challenges such as COVID-19 may be those skill sets that are best developed through hands-on learning (Tarrant and Thiele 2014). It is also possible that the next global crisis might not be solved by social distancing and associated asynchronous and online learning. Indeed, the next crisis might require leaders who are comfortable coming together to work hands-on as teams and communities. Either these skills can be conveyed online (research so far is not hopeful) or experiential hands-on learning will remain key to our continued resilience during the challenging times ahead.

Lesson 3: when facing big issues, being a part of “small wins” has a major emotional impact

Critiques of environmental education programs have documented students struggling with enacting meaningful change in the face of barriers such as personal inconvenience, pessimism about the impacts of their actions, and frustration with the attitudes and behaviors of others (Boyes et al. 2009; Breuing et al. 2014). Indeed, it is easy for action inspired by environmental education to feel insignificant in the face of daunting environmental challenges. However, one of the values of experiential environmental education is the opportunity to help students build their confidence through “small wins” addressing environmental problems. These opportunities can have a major emotional impact and serve to inspire future action and informed hope when addressing wicked problems (Weick 1984). For example, during their time at the OE, students had the opportunity learn and practice skills related to self-sufficiency and sustainable food production such as woodworking, animal husbandry, gardening, and food preservation. Students frequently expressed excitement about using these new skills when they return to their homes and teaching others. There is no panacea to the myriad and partially unknown challenges of sustainability and climate change, but it is increasingly clear that feeling overwhelmed and disempowered does not lead to solutions and positive change, while taking part in practical hands-on solutions increases one’s ability to act with such resilience again in future challenges.

Final Thoughts

This article aims to provide lessons learned from adapting experiential learning opportunities to the COVID-19 pandemic and offers reflections on the implications of these lessons for the field of environmental education. Although the nature of the COVID-19 crisis acts as a barrier to hands-on learning, during this unprecedented time, the benefits of experiential environmental education are more needed than ever. As the pandemic continues, it is increasingly important to share these lessons learned from efforts to safely provide hands-on experiential education opportunities.

This paper shares the experience of the Oregon Extension, an undergraduate study away program based out of the Cascade-Siskiyou National Monument in Southern Oregon, that successfully adapted field-based environmental education programming during the COVID-19 pandemic. The experience of the Oregon Extension’s students and faculty/staff helps reinforce the value of field-based learning even during uncertain times and provides examples of how the program was able to build a strong sense of community among participants and enhance students learning experience while also adapting to COVID-19 safety protocols. Although the Oregon Extension is a special case due to its secluded location and student population, the experiential learning model utilized by the Oregon Extension could be adapted by academic programs across the country looking to use their field stations in innovative interdisciplinary ways while also promoting COVID-19 safety.

This manuscript also responds to recent calls to justify the importance of experience based environmental education as the world adapts to the COVID-19 pandemic (Quay et al. 2020). This article also highlights the importance of experiential learning opportunities provided by programs like the Oregon Extension in helping the next generation build the skills and mindsets that will be necessary to combat current and future crises. In fact, the same skills educators have identified as being important while adapting to the COVID-19 pandemic are those honed by field-based environmental education activities. Environmental education enables students to critically analyze their impact on the world while producing environmentally knowledgeable and engaged global citizens with the skills and motivation necessary to participate in developing and implementing solutions to societal and environmental challenges.

Efforts to provide hands-on field-based environmental education opportunities during the COVID-19 pandemic also open many exciting opportunities for future research. Research that highlights efforts to adapt to the COVID-19 pandemic can continue to provide useful insights

for addressing other wicked challenges such as climate change. As we have adapted to the COVID-19 pandemic, the world also has experienced an increased awareness of wicked challenges related to justice and equity over the past few years. While this paper has not contributed new insights related to environmental justice, it is important to emphasize the fact that it is becoming increasingly important for educators to open spaces for emotional and uncomfortable analysis of environmental justice issues (Forsythe and Chan., 2021). Research that facilitates these tough conversations within the context of environmental education will be very valuable. Interdisciplinary research that helps educators facilitate understanding of connections between the global pandemic, environmental challenges, and justice/equity will also be especially valuable (Rodrigues and Lowan-Trudeau 2021).

Acknowledgements This manuscript would not have been written without the support and feedback from the Oregon Extension faculty and staff from the 2020 semester including: Kelton (Tad) Cobb, Star Tarrant, Jim Hood, and Megan Good. I would like to especially acknowledge the contributions of Oregon Extension faculty member Seaton Tarrant, whose guidance and suggestions made this article what it is today.

Declarations

Conflict of interest The author declares no competing interests.

References

- Arnold ME, Rennekamp RA (2020) A time like no other: 4-H youth development and COVID-19. *J Ext* 58(3) <https://www.joe.org/joe/2020june/comm1.php>
- Bartlett JD, Griffin J, Thomson D (2020) Resources for supporting children's emotional well-being during the COVID-19 pandemic. *Child Trends*. Retrieved from: <https://www.childtrends.org/publications/resources-for-supporting-childrens-emotional-well-being-during-the-covid-19-pandemic>
- Boyes E, Skamp K, Stanisstreet M (2009) Australian secondary students' views about global warming: beliefs about actions, and willingness to act. *Res Sci Educ* 39:661–680
- Breuing M, Murtell J, Russell C, Howard R (2014) The impact of integrated environmental studies programs: are students motivated to act pro-environmentally? *Environ Educ Res* 20(3). <https://doi.org/10.1080/13504622.2013.807326>
- Calvert ML, Janeiro MGF (2020). Impact of COVID-19 on Missouri 4-H state fair participation and implications for youth development programs. *Journal of Extension*, 58(6). <https://www.joe.org/joe/2020december/comm1.php>
- Capaldi CA, Passmore H-A, Nisbet EK, Zelenski JM, Dopko RL (2015). Flourishing in nature: a review of the benefits of connecting with nature and its application as a wellbeing intervention. *International Journal of Wellbeing*, 5(4), Article 4. <https://doi.org/10.5502/ijw.v5i4.449>
- Cockerill K (2013) A failure reveals success: A comparative analysis of environmental education, education for sustainable development, and industrial ecology education. *J Ind Ecol* 17(5):633–641
- Dillman-Hasso N (2021) The nature buffer: The missing link in climate change and mental health research. *The Journal of Environmental Studies and Sciences*. <https://doi.org/10.1007/s13412-021-00669-2>
- Elsden-Clifton J, Futter-Puati D (2015) Creating a health and sustainability nexus in food education: designing third spaces in teacher education. *Aust J Environ Educ* 31(1):86–98 From <https://www.jstor.org/stable/26422886>
- Forsythe ME, Chan YW (2021) Justice-centered education amid the COVID-19 pandemic. *J Environ Educ*. <https://doi.org/10.1080/00958964.2021.1981208>
- Jickling B, Wals AEJ (2008) Globalization and environmental education: looking beyond sustainable development. *J Curric Stud* 40(1):1–21
- Jones P, Selby D, Sterling S (2010) Sustainability education: perspectives and practice across higher education. Routledge
- Kaplan R, Kaplan S (1989). *The experience of nature: a psychological perspective*. Cambridge; New York: Cambridge University Press. <http://archive.org/details/experienceofnatu00kapl>
- LaCharite K (2016) Re-visioning agriculture in higher education: the role of campus agriculture initiatives in sustainability education. *Agric Hum Values* 33:521–535. <https://doi.org/10.1007/s10460-015-9619-6>
- Louv R (2008) *Last child in the woods: saving our children from nature-deficit disorder* (Updated and expanded.. ed.). Chapel Hill, N.C.: Algonquin Books of Chapel Hill
- Louv R (2012) *The nature principle: reconnecting with life in a virtual age* (1st paperback ed.). Chapel Hill, N.C.: Algonquin Books of Chapel Hill.
- Loynes C (2012). Why we need EE and ESD. *Environmental Education in Focus*. National Association for Environmental Education.
- Lumber R, Richardson M, Sheffield D (2017) Beyond knowing nature: contact, emotion, compassion, meaning, and beauty are pathways to nature connection. *PLoS One* 12(5):e0177186. <https://doi.org/10.1371/journal.pone.0177186>
- Martin T (2020) Digging at the root of the tree: Conceptualizing relational ecological identity. *Can J Environ Educ* 23(3)
- Mayer FS, McPherson Frantz C, Bruehlman-Senecal E, Dolliver K (2009) Why is nature beneficial: the role of connectedness to nature. *Environ Behav* 41(5)
- Mendez R (2017). Healthy parks healthy people bay area: A roadmap and case study for regional collaboration. National Park Service. https://www.parkrx.org/sites/default/files/resources/HPHPBAYArea_Roadmap_Case_Study_2017.pdf
- McKenzie L (2021). Students want online learning options post-pandemic. *Inside Higher Education*. <https://www.insidehighered.com/news/2021/04/27/survey-reveals-positive-outlook-online-instruction-post-pandemic>
- O'Brien C, Howard P (2016) The living school: the emergence of a transformative sustainability education paradigm. *J Educ Sustain Dev* 10(1):115–130. <https://doi.org/10.1177/0973408215625549>
- Oh KH, Shin WS, Khil TG, Kim DJ (2020) Six-step model of nature-based therapy process. *Int J Environ Res Public Health* 17(3). <https://doi.org/10.3390/ijerph17030685>
- Pavlova M (2012) Towards using transformative education as a benchmark for clarifying differences and similarities between environmental education and education for sustainable development. *Environ Educ Res* 19(5):656–672
- Rodrigues C, Lowan-Trudeau G (2021) Global politics of the COVID-19 pandemic, and other current issues of environmental justice. *J Environ Educ* 52(5):293–302. <https://doi.org/10.1080/00958964.2021.1983504>
- Román DX, Castro M, Baeza C, Knab R, Huss-Lederman S, Chacon M (2021) Resilience, collaboration, and agency: Galapagos teachers confronting the disruption of COVID-19. *J Environ Educ*. <https://doi.org/10.1080/00958964.2021.1981204>

- Quay J, Gray T, Thomas G, Allen-Craig S, Asfeldt M, Andkjaer S, Beames S, Cosgriff M, Dymont J, Higgins P, Ho S, Leather M, Mitten D, Morse M, Neill J, North C, Passey R, Pedersen-Gurholt K, Polley S et al (2020) *Journal of Outdoor Environmental Education* 23:93–117
- Rios C, Neilson AL, Menezes I (2021) COVID-19 and the desire of children to return to nature: Emotions in the face of environmental and intergenerational injustices. *J Environ Educ*
- Rousell D, Chan KK (2021): Activist ecologies of study in the learning city: deformatisations of educational life, discourse: Studies in the cultural politics of education, <https://doi.org/10.1080/01596306.2021.1975910>
- Schmidt RC (2021) Are there similarities between the Corona and the climate crisis? *J Environ Stud Sci*. <https://doi.org/10.1007/s13412-021-00666-5>
- Tarrant SP, Thiele LP (2014) The web we weave: online education and democratic prospects. *New Polit Sci* 36(4):538–555. <https://doi.org/10.1080/07393148.2014.954790>
- Tarrant SP, Thiele LP (2016) Practice makes pedagogy – John Dewey and skills-based sustainability education. *Int J Sustain High Educ* 17(1):54–67. <https://doi.org/10.1108/IJSHE-09-2014-0127>
- Tillmann S, Tobin D, Avison W, Gilliland J (2018) Mental health benefits of interactions with nature in children and teenagers: a systematic review. *J Epidemiol Community Health* 72(10):958–966. <https://doi.org/10.1136/jech-2018-210436>
- Weick KE (1984) Small wins: redefining the scale of social problems. *Am Psychol* 39(1):40–49. <https://doi.org/10.1037/0003-066X.39.1.40>

Publisher's Note Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.