

Reorienting training in the time of Covid-19 and social justice movements

Laura B. Woods^a, Robert B. Powell^a, Marc J. Stern^b, Brandon T. Frensley^c, and Brett A. Wright^a


^a Department of Parks, Recreation & Tourism, Clemson University, Clemson, South Carolina, USA ^b Department of Forest Resources and Environmental Conservation, Virginia Tech, Blacksburg, Virginia, USA ^c Department of Environmental Sciences, University of North Carolina Wilmington, Wilmington, North Carolina, USA

ABSTRACT

Covid-19 and the Black Lives Matter movement have changed the social and political landscape in which environmental educators work. To meet these challenges and to assess current training needs, we invited members of three national U.S. organizations to rate 28 different professional competencies in terms of importance and preparedness to perform. Our results showed that educators have the greatest need for training in diversity, equity, and inclusion; and communicating about complex and controversial issues. Additionally, environmental educators prefer training that is delivered through in-person exercises, online courses, and participation in learning communities. This information can help prioritize future professional development.

KEYWORDS

Professional development, Training, Diversity, Equity, and Inclusion, environmental education

CONTACT Robert B. Powell rbp@clemson.edu  Department of Parks, Recreation & Tourism, Clemson University, Clemson, SC, USA.

Supplemental data for this article can be accessed online at <https://doi.org/10.1080/1533015X.2022.2078439>.

© 2022 Taylor & Francis Group, LLC

Introduction

The Covid-19 pandemic and the Black Lives Matter (BLM) movement have re-emphasized the need for environmental educators to continually adapt and improve their skills and abilities to best serve diverse audiences, using diverse platforms, in the 21st century. While the response to Covid-19 forced environmental educators to master new methods of reaching their audiences, the BLM movement placed a spotlight and reinforced the long-standing need for creating programming and spaces that are relevant and equitable for Black, Indigenous, and people of color (BIPOC) (e.g., Finney, 2014; Warren et al., 2014). However, we know little about current training needs of the field to achieve these goals and others. Therefore, in light of the current social and political landscape, this research seeks to answer the following questions: 1) What do environmental educators consider to be the most important professional competencies necessary for delivering high quality environmental education (EE)? 2) How well-prepared do environmental educators feel they are in performing these professional competencies? 3) Which professional competencies have the largest gaps between importance and preparedness? and 4) What is the field's preferred way of receiving professional development? To address these questions, we invited members of the Association of Nature Center Administrators (ANCA), the North American Association for Environmental Education (NAAEE), the National Association for Interpretation (NAI), and U.S. state affiliate networks to complete an online survey which asked environmental educators to rate 28 different professional competencies in terms of importance and their levels of preparedness to perform. These two

scores were used to identify “gaps” between importance and preparedness and to highlight the knowledge, skills, and abilities (KSAs) that these environmental educators reportedly want and need to enhance their work. This information will help prioritize professional development opportunities that fill the current competency gaps of environmental educators rather than using valuable resources on trainings focused on KSAs that they either already do well or consider unimportant.

Literature review

Professional competencies for environmental educators

In the United States, unified EE professional standards for educators does not exist across federal, state, local, or nonprofit entities. Only 14 states in the U.S. offer environmental educator certification courses, and only three of these state programs (Georgia, Colorado, and Kentucky) are NAAEE certified (NAAEE, 2020). While there are no standardized forms of professional development for environmental educators, the goal of NAAEE’s Professional Development of Environmental Educators: Guidelines for Excellence (2019) is to provide a set of consensus best practices to guide professional development. These guidelines have been developed and reviewed with the input from EE academics and professionals (NAAEE, 2020). Based on NAAEE’s guidelines for excellence and emerging issues facing the field such as Covid-19 and BLM, the five training themes below appear particularly relevant for environmental educators and are therefore addressed in our study.

Diversity, equity, and inclusion

While issues of diversity, equity, and inclusion (DEI) have been discussed in the EE field for years, the 2020 Black Lives Matter movement has highlighted the racial inequities across society and the heightened need for the field to create relevant, equitable, and inclusive programming for BIPOC (NAAEE, 2017; 2020; Stern et al., 2022). Despite the importance of addressing issues of DEI, environmental educators have struggled with developing the KSAs necessary to overcome barriers to participation and create programs that are inclusive, equitable, and attractive for diverse audiences (Pease, 2015; Schultz et al., 2019), such as meeting the needs of diverse audiences (Bonta et al., 2015; Hudson, 2001); creating content that is culturally relevant (Ladson-Billings, 1995; Simon, 2016); attracting and retaining diverse staff (Pease, 2015; Roberts, 2007; Stern et al., 2022); and promoting an inclusive, welcoming, and equitable environment (Warren & Breunig, 2019).

Educator skills

In this study, educator skills refer to specific ways in which environmental educators interpersonally interact with their students and create a positive instructional environment. Demonstrating emotional support and positive communications (e.g., O’Hare et al., 2020), effective public speaking skills (e.g., Powell & Stern, 2013), classroom management (e.g., Marzano et al., 2003), as well as facilitating participant-centered teaching and discussions about controversial issues (e.g., Brownlee et al., 2013; Monroe et al., 2019) are all particularly important in EE. In fact, the ability to effectively facilitate discussions related to complex environmental issues (i.e., climate change) is at the heart of EE (NAAEE, 2020).

Instructional techniques

The instructional techniques in this study refer to different approaches, techniques, and pedagogies that have been recommended in NAAEE’s Professional Development of Environmental Educators: Guidelines for Excellence (2019) as well as research (e.g., Stern et al., 2014) for producing positive

participant outcomes including enhancing environmental literacy. Instructional techniques determine how a program is structured and the types of activities undertaken, such as investigation-focused, issue-based, experiential learning, or place-based educational approaches (e.g., Dale et al., 2020; Gruenewald, 2008; Hungerford et al., 2003; Jose et al., 2017; Moseley et al., 2020; Woodhouse & Knapp, 2000).

Planning and evaluation

The NAAEE's Professional Development of Environmental Educators: Guidelines for Excellence (2019) stresses the importance of program planning as a skill for EE instructors. In this study, we use the term "planning" to encompass the competencies that are necessary to effectively develop EE programming such as goal setting, linking to curriculum standards, and logic modeling. Another crucial aspect of planning is using evaluation to monitor performance and inform iterative programmatic improvement (Monroe, 2010; Powell et al., 2017). These evaluation skills include informal processes such as reflection and peer-observation, as well as formal systematic data collection and analysis skills (Powell et al., 2017).

Creating online programs and resources

Traditionally, many EE programs consist of in-person and in-nature experiences. However, due to the Covid-19 pandemic and social distancing restrictions, EE organizations have struggled to reach their audiences and create alternative programming. According to a study and policy brief by Collins et al. (2020), many U.S. organizations are revamping their programming to enhance accessibility by providing distance learning and online EE experiences. For this study, we focused on broad professional competencies related to high quality synchronous and asynchronous online EE programming (e.g., Merritt et al., 2022).

Methods

Competency and survey development

The professional competencies were developed based upon NAAEE's Professional Development of Environmental Educators: Guidelines for Excellence (2019), a recent training needs assessment conducted by the U.S. National Park Service (NPS) (Powell et al., 2017), reviews of literature on environmental education and interpretation (e.g., Ardoin et al., 2018; Skibins et al., 2012; Stern et al., 2014), as well as iterative professional/practitioner review, which included review and refinement of items as well as pilot-testing. We initially identified five training themes that were deemed important for providing effective EE in the 21st century and we used these to focus our competency development. During our iterative review process, which included faculty from three universities and EE practitioners from a variety of backgrounds, we refined the list of professional competencies and developed additional ones as needed. While the issues of DEI and Creating Online Programs and Resources are covered briefly in the NAAEE (2019) Professional Development Guidelines, we placed more emphasis on these issues due to the current social and political climate surrounding the 2020 Black Lives Matter Movement and the Covid-19 pandemic, respectively.

We used Qualtrics to create an online survey instrument. The final survey included 28 individual competencies organized under five training themes: DEI, Educator Skills, Instructional Techniques, Planning and Evaluation, and Creating Online Programs and Resources (Tables 1-5). Survey respondents were asked to rate each individual competency twice following recommendations by Powell et al. (2017); Depper, et al. (2015-2016); Weddell et al. (2009; 2013); and Machnik et al. (2007). First, they rated how important they perceived the item to be in their current EE position on a 1-5 Likert-type scale

(Unimportant to Extremely Important). Then they rated how well prepared they felt to perform that competency on a 1-5 Likert-type scale (Unprepared to Extremely Well-Prepared). Respondents also indicated which methods of professional development delivery they have participated in within the last three years and what modes of delivery they would prefer for future professional development. Finally, the survey contained demographic questions recording respondents' organization type and size, number of years in the EE field, current job position, racial identity, age, and gender identity.

Table 1. Diversity, equity, and inclusion: mean importance, preparation, and MWD scores. ([Table view](#))

| Competencies | Mean importance | Mean preparation | MWDS |
|---|-----------------|------------------|-------|
| Theme: diversity, equity, and inclusion | 4.67 | 3.20 | -6.93 |
| Attracting more diverse audiences to your programming | 4.64 | 3.00 | -7.67 |
| Adapting programming to meaningfully engage diverse audience members and meet their needs | 4.75 | 3.22 | -7.30 |
| Understanding the needs and desires of different audiences | 4.79 | 3.33 | -7.05 |
| Using inclusive language that resonates with your audiences | 4.66 | 3.34 | -6.17 |
| Collaborating with diverse groups to co-create programs they desire | 4.49 | 3.10 | -6.33 |

Table 2. Educator skills: mean importance, preparation, and MWD scores. ([Table view](#))

| Competencies | Mean importance | Mean preparation | MWDS |
|---|-----------------|------------------|-------|
| Theme: educator skills | 4.56 | 3.94 | -2.88 |
| Classroom/Group management - encouraging participation, minimizing disruptions, and managing behaviors of the group to enable a high-quality experience | 4.58 | 4.16 | -1.96 |
| Participant-centered teaching - enabling flexibility for participants to follow their own interests within the program and maximizing student autonomy | 4.37 | 3.81 | -2.51 |
| Emotional support - creating an environment that enhances participants' feelings of safety, belonging, and comfort | 4.60 | 3.81 | -3.69 |
| Public speaking - organizing program content, presenting confidently, and answering questions appropriately | 4.66 | 4.40 | -1.26 |
| Communicating about complex and controversial issues - framing and facilitating conversation to reduce conflict and allow for effective discussion | 4.57 | 3.48 | -5.07 |

Table 3. Instructional techniques: mean importance, preparation, and MWD scores. ([Table view](#))

| Competencies | Mean importance | Mean preparation | MWDS |
|--|-----------------|------------------|-------|
| Theme: instructional techniques | 4.42 | 3.91 | -2.26 |
| Hands-on discovery - the educator facilitates direct interactions and experiences with the environment | 4.86 | 4.49 | -1.84 |
| Inquiry - the educator uses participants' questions to guide the program | 4.65 | 4.17 | -2.25 |
| Cooperative learning - the educator encourages participants to work together to learn or complete a task | 4.40 | 4.09 | -1.42 |

| Competencies | Mean importance | Mean preparation | MWDS |
|--|-----------------|------------------|-------|
| Problem-based education - the educator has participants seek or research solutions to a specific problem | 4.22 | 3.70 | -2.20 |
| Investigation - the educator helps participants identify an issue, formulate research questions, collect data, analyze data, and draw valid conclusions | 4.27 | 3.76 | -2.19 |
| Service learning - the educator facilitates a project in which participants provide a service for others/the environment | 4.16 | 3.77 | -1.62 |
| Storytelling - the educator tells a holistic story that conveys deeper meanings to participants | 4.12 | 3.46 | -2.77 |
| Place-based education - the educator makes the unique attributes of the place/resource a central focus of the program | 4.61 | 4.21 | -1.85 |
| Experiential learning cycle - the educator provides a concrete experience, facilitates reflection and the use of this new knowledge in another context or experience | 4.43 | 3.79 | -2.91 |
| Community-based education - the educator helps participants to engage in local environmental action | 4.39 | 3.53 | -3.81 |

Table 4. Planning and evaluation: mean importance, preparation, and MWD scores. (Table view)

| Competencies | Mean importance | Mean preparation | MWDS |
|--|-----------------|------------------|-------|
| Theme: planning and evaluation | 4.44 | 3.73 | -3.10 |
| Curriculum development - aligning content with educational standards and deciding which specific topics will be covered, and to what depth | 4.38 | 3.89 | -2.22 |
| Program planning - deciding what activities and approaches will be used and what outcomes are to be achieved for each specific program | 4.63 | 4.14 | -2.33 |
| Informal program evaluation - assessment about a program's effectiveness that uses periodic reflection, peer-observations, or other nonsystematic methods and forms of data collection | 4.43 | 3.67 | -3.41 |
| Formal program evaluation - the systematic collection and analysis of data to draw conclusions and make informed decisions about the effectiveness of your programs | 4.28 | 3.23 | -4.51 |

Table 5. Creating online programs and resources: mean importance, preparation, and MWD scores. (Table view)

| Competencies | Mean importance | Mean preparation | MWDS |
|--|-----------------|------------------|-------|
| Theme: creating online programs and resources | 4.08 | 3.06 | -4.17 |
| Using social media to reach new audiences | 4.21 | 3.27 | -4.01 |
| Creating high quality supplemental online materials for use before or after a live program | 4.06 | 3.02 | -4.27 |
| Creating high quality synchronous (live) online programming | 4.04 | 2.94 | -4.51 |
| Creating high quality asynchronous (pre-recorded) online programming | 3.98 | 3.01 | -3.90 |

Data collection procedures

We used a purposive sampling method to reach environmental educators. Invitations containing a description of the survey, voluntary consent information, and a link to the Qualtrics survey instrument were sent to members of NAAEE, ANCA, and NAI via e-newsletters in October–November 2020. When the survey closed in December 2020, we received 463 total responses. Of the total responses, we only included those that were at least 50% completed in our analyses ($n = 379$).

Analyses

We computed the mean and standard deviation for each individual competency. We then computed a Mean Weighted Discrepancy Score (MWDS) for each competency item to quantify the gap between importance and preparedness scores, while taking into account the average importance score from all respondents (Edwards & Briers, 1999; Powell et al., 2017; Robinson & Garton, 2008). The MWDS formula is as follows: $[(\text{Preparedness} - \text{Importance}) \times (\text{Importance Grand Mean})]$. The range of possible MWDS is from -20 to $+4$. Items with a larger MWDS (a negative number with a larger absolute value) indicate a greater need for professional development. A smaller MWDS (a negative number with a smaller absolute value, or a positive number) will indicate that environmental educators are receiving a nearly adequate, adequate, or excess of professional development regarding that particular competency. We also calculated a composite index MWDS for each of the five overall competency themes. Additionally, we used an Importance Performance Analysis (IPA) as an alternative way of identifying the KSAs that managers may want to focus on for their professional development opportunities. Developed by Martilla and James (1977), an IPA is a quantitative method of visualizing and analyzing the preparedness of a population to perform particular tasks while also accounting for the relative importance of these skills for successfully performing a job (Oh, 2001; Warner et al., 2016). The importance and performance scores of each competency is graphed where importance is on the y-axis and performance/preparedness is on the x-axis. The two axes meet at the grand mean for importance and performance of all competencies. The upper right quadrant of an IPA identifies those competencies that are of high importance and low levels of preparedness. Finally, we used descriptive statistics to identify which methods of professional development delivery educators prefer.

Results

Demographics of survey respondents

A majority of respondents (81%) indicated they teach EE programs. Over half (66%) also indicated that they manage EE programs and employees. Many of the respondents (43.3%) were very experienced with 15 or more years in the EE field. The average age of respondents was 42 with the largest share of respondents (47.4%) in the “Millennial” generation. The overwhelming majority (95.5%) of our respondents were from the United States. Our respondents largely self-identified as White/Caucasian (92.5%) and female (82%). The next highest reported racial identity was “Mixed Race” at 3.7% (Appendix: Table 1 [supplementary material]).

Almost half (44.2%) indicated they worked at a nonprofit organization or a nature center. Nearly one-third (31.3%) of respondents indicated they worked for a protected area, park, or other government agency. Most respondents (82%) indicated they work at a small (<10 employees; 45.6%) or medium-sized (10–49 employees; 36.4%) organization (Appendix: Table 1 [supplementary material]). Most respondents also worked at organizations that serve all age groups either “sometimes” or “often” (Appendix: Table 2 [supplementary material]). Lastly, most respondents work at organizations that serve a diverse public including people of color, people for whom English is not their first language, and people of lower socio-economic status (Appendix: Table 2 [supplementary material]).

Importance of competencies

Overall, the results indicate that EE practitioners thought all competency themes were important or very important with overall mean scores ranging from 4.08 to 4.67 out of 5 (Tables 1–5). The DEI competency theme had the highest average mean importance (4.67) (Table 1). The Educator Skills competency theme had the next highest mean importance (4.56) (Table 2). The Creating Online Programs and Resources competency theme (Table 5) ranked last in importance with an average importance score of 4.08.

Level of preparedness

The Educator Skills competency theme (Table 2) had the highest average mean preparedness score (3.94). The DEI competency theme (Table 1) had the second to lowest average mean preparedness score (3.20), with individual competency mean preparedness scores ranging from 3.00 to 3.34. The mean preparation scores for the Creating Online Programs and Resources competency theme (Table 5) had the lowest average mean preparedness score of any competency theme at 3.06.

Mean weighted discrepancy scores for each competency area

The DEI competency theme (composite score) had the largest composite MWDS (-6.93) (Table 1) and the Instructional Techniques competency theme had the smallest (-2.26) (Table 3). In the DEI theme, the two individual competencies with the largest MWDS were attracting diverse audiences (-7.67) and engaging diverse audiences (-7.30) (Table 1). For the Educator Skills theme, the two competencies with the largest MWDS pertained to talking about complex and controversial issues (-5.07) and providing emotional support to participants (-3.69) (Table 2). Within the Instructional Techniques theme, the competencies with the two largest MWDS were using community-based education (-3.81) and the experiential learning cycle (-2.91) (Table 3). For the Planning and Evaluation competency theme, formal (-4.51) and informal (-3.41) evaluation had the two largest MWDS (Table 4). Lastly, within the Creating Online Programs and Resources category, the competencies with the two largest MWDS were creating synchronous online programming (-4.51) and supplemental online materials (-4.27) (Table 5).

Importance performance analysis

The results of our IPA showed that six competency items were in the “Concentrate Here” quadrant. This included all five items from the DEI competency theme, as well as *communicating about complex and controversial issues* from the Educator Skills theme. All competency items from the Creating Online Programs and Resources theme were in the “Lower Priority” quadrant. The competency items *storytelling* and *community-based education* were also in the “lower priority” quadrant. The remaining Instructional Techniques competencies were split between the “Maintain Performance” and “Possible Overkill” quadrants. Three of the five Educator Skills competencies were in the “Maintain Performance” quadrant, with *participant-centered teaching* falling into the “Possible Overkill” quadrant. The Planning and Evaluation competency theme items were spread with *curriculum development* and *informal program evaluation* in the “Possible Overkill” quadrant, *program planning* in the “Maintain Performance” quadrant, and *formal program evaluation* in the “Lower Priority” quadrant (Figure 1) (Table 6).



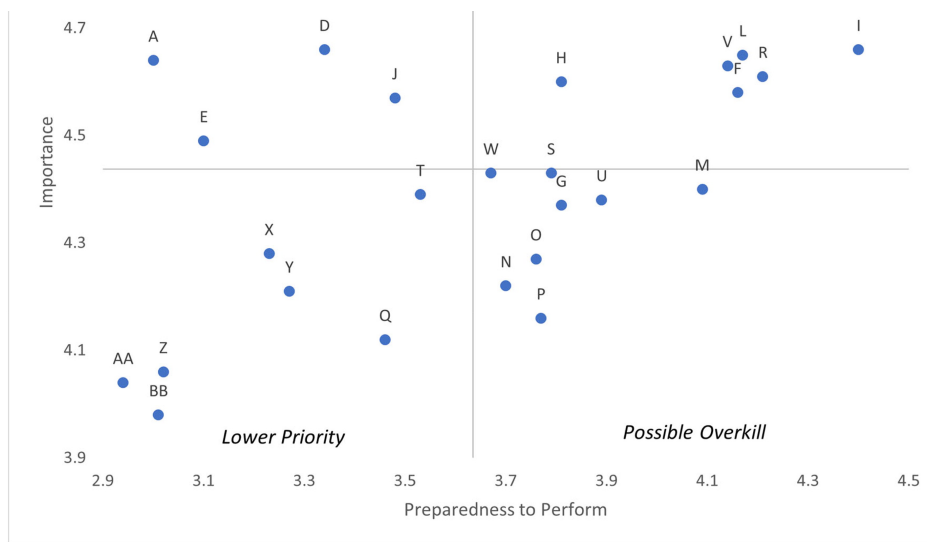


Figure 1. Importance Performance Analysis of Professional Competencies.

Table 6. Professional competency item key for IPA. (Table view)

| | |
|----|--|
| A | Attracting more diverse audiences to your programming |
| B | Adapting programming to meaningfully engage diverse audience members and meet their needs |
| C | Understanding the needs and desires of different audiences |
| D | Using inclusive language that resonates with your audiences |
| E | Collaborating with diverse groups to co-create programs they desire |
| F | Classroom/Group management |
| G | Participant-centered teaching |
| H | Emotional support |
| I | Public speaking |
| J | Communicating about complex and controversial issues |
| K | Hands-on discovery |
| L | Inquiry |
| M | Cooperative learning |
| N | Problem-based education |
| O | Investigation |
| P | Service learning |
| Q | Storytelling |
| R | Place-based education |
| S | Experiential learning cycle |
| T | Community-based education |
| U | Curriculum development |
| V | Program planning |
| W | Informal program evaluation |
| X | Formal program evaluation |
| Y | Using social media to reach new audiences |
| Z | Creating high quality supplemental online materials for use before or after a live program |
| AA | Creating high quality synchronous (live) online programming |
| BB | Creating high quality asynchronous (pre-recorded) online programming |

What methods of delivery do educators prefer for future professional development?

When asked to indicate which forms of professional development respondents would prefer in the future, in-person training was the most popular (74.7%), followed closely by online courses (72.6%), and participation in a professional learning community (58.8%). The least popular methods for future delivery were college level courses (18.7%) and performance reviews from a superior (13.2%) (Table 7).

Table 7. Preferred methods for delivery of future professional development. (Table view)

| Method of delivery | Percentage |
|--|------------|
| In-person training exercises/workshops | 74.7% |
| Online courses | 72.6% |
| Participation in a professional learning community | 58.8% |
| Conferences | 55.4% |
| Workshops for curriculum certification (for example, Project Learning Tree, Project WILD, Project WET) | 43.0% |
| Self-improvement (for example, reading articles, YouTube videos) | 39.1% |
| Mentoring | 29.8% |
| Observing colleagues | 29.8% |
| State certification | 28.8% |
| Receiving peer review from colleagues | 22.4% |
| Personal reflection on my own performance | 20.8% |
| College-level courses | 18.7% |
| Performance reviews from boss (or other superior) | 13.2% |

Discussion

The events of 2020 have disrupted the status quo of environmental education and stress the need for continually updating professional development opportunities. Themes that are covered in traditional EE professional development, such as basic educator skills and instructional techniques, in general, had smaller MWDS than DEI-focused competencies and creating online content competencies, which potentially reflects the highly experienced environmental educators in the sample of this study (Table 8). Additionally our sample, although not necessarily representative of the broader field, does suggest that the EE workforce is overwhelmingly white and female, which corresponds with other studies that found that despite efforts to diversify the EE workforce, little headway has been made (Bonta et al., 2015). Our results also suggest that training in competencies pertaining to DEI appeared most pressing (Table 8). Other studies suggest that training should focus on assets-based culturally responsive teaching, which values differences as strengths that especially benefits students whose languages, cultures, and identities are traditionally seen as barriers to learning (e.g., Muñoz, 2019). Additionally, Simon (2016) suggests that training on how to co-create programs with diverse audiences will ensure that future programs enhance relevance and meaningful connections. However, despite the emphasis on developing DEI best practices, some suggest it is difficult for small organizations with limited resources to master and use them consistently (Barreto et al., 2017). Similarly, Roberts and Spears (2020) argue that the need for using practices that support DEI cannot be divorced from advocating for investments in hiring a more diverse staff as well as providing employees with DEI training, which appears paramount to assuring environmental educators feel well-prepared. For the delivery of DEI professional development, Barreto et al. (2017) found that educators are most interested in tailored workshops and ongoing coaching from

objective experts. This mirrors our finding that in-person workshops and exercises are the most preferred method for future professional development.

Table 8. Competencies with the ten largest MWD scores. ([Table view](#))

| Competencies | MWDS |
|--|-------|
| Attracting more diverse audiences to your programming | −7.67 |
| Adapting programming to meaningfully engage diverse audience members and meet their needs | −7.30 |
| Understanding the needs and desires of different audiences | −7.05 |
| Collaborating with diverse groups to co-create programs they desire | −6.33 |
| Using inclusive language that resonates with your audiences | −6.17 |
| Communicating about complex and controversial issues | −5.07 |
| Formal program evaluation | −4.51 |
| Creating high quality synchronous (live) online programming | −4.51 |
| Creating high quality supplemental online materials for use before or after a live program | −4.27 |
| Using social media to reach new audiences | −4.01 |

With the advent of the Covid-19 pandemic and the elimination of many face-to-face programs, it is not surprising that competencies related to Creating Online Programs and Resources had relatively high MWDS as compared with other competencies ([Table 8](#)). However, what was more unexpected is that despite many organizations having to switch their programming to online formats, *creating synchronous and asynchronous programs* were rated significantly lower in importance than other competencies in this theme. The potential reason for this result is how deeply the field of environmental education is rooted in immersive in-person experiences. While there is plenty of evidence to support the positive benefits associated with in-person and outdoor field experiences for students and others (e.g., Dillon et al., [2006](#); Eick, [2012](#); Jose et al., [2017](#)), adaptations must be made when these experiences are no longer an option. Environmental educators may view creating online programs as only a temporary requirement until the pandemic is over (Quay et al., [2020](#)). However, the extended duration of the current Covid-19 pandemic, the possibility of future pandemics (Simpson et al., [2020](#)), and the issue of accessibility for students who may not be able to attend in-person programs all contribute to the importance of developing environmental educators' ability to create high quality online programming (Merritt et al., [2022](#)). Other results of note include that the use of social media had the highest importance score of any of the other competencies in this theme.

Two additional specific competencies were identified as having high training needs. First, our results showed that *communicating about complex and controversial issues* had a high MWDS and fell within the “Concentrate Here” quadrant of the IPA. A recent study by Nation and Feldman ([2021](#)) found that educators often feel uncomfortable discussing complex and controversial issues like climate change because of their political nature. Because of this, educators may try to limit how often they discuss these issues, even if they consider them to be important (Nation & Feldman, [2021](#)). Brownlee et al. ([2013](#)) and Stern ([2018](#)) review a range of theoretical considerations that could improve the teaching and discussion of complex issues. These reviews suggest it is possible that with more training and practice, educators may become more effective and confident, or well-prepared, to tackle these tough issues. Lastly, the level of preparedness for *formal program evaluation* is consistently low. While this competency item did not fall into the “Concentrate Here” quadrant of the IPA, it did have one of the largest MWDS out of all competencies ([Table 8](#)). Because formal program evaluation is a complex skill that involves systematic

data collection, analysis, and often the use of specialized software, this competency is not one that can be easily mastered by someone who does not have extensive education in this theme (Keene & Blumstein, 2010).

The most evident limitation to our study was the lack of diversity among respondents. Our respondents were overwhelmingly white and female. Additionally, very few respondents were Generation Z, although many people in this generation have already entered the workforce. This lack of participation by diverse and youthful individuals is often cited as an issue in environmental education (e.g., Bonta et al., 2015) and reflects the membership of the participating professional organizations. Thus, by only targeting these professional organizations, we may have created a response bias toward more experienced, older, and less diverse educators. An additional limitation to using a survey is that our data on preparedness is self-reported and subjective. Finally, our study was not able to include every professional competency that is important for environmental educators to do their jobs across all settings. This study attempted to focus on professional competencies that are universally important for most environmental educators especially during the Covid-19 pandemic and in light of renewed and ongoing efforts to address systemic racism.

Conclusion

The results identified several fruitful professional development needs. Our analyses identified not only broad themes, like DEI, in which environmental educators need further training, but also specific skills, like discussing controversial issues, that require attention. The results of this needs assessment will aid EE organizations such as NAAEE, ANCA, NAI, the U.S. National Park Service, and others, by highlighting the specific professional competencies environmental educators need, as well as options for how to deliver them. This needs assessment is particularly salient in 2021's political and social landscape, as it emphasizes issues related to creating online environmental education content and promoting diversity, equity, and inclusion. Our study is part of an effort to continuously revise and update professional development needs in the environmental education field so that educators may be well-equipped to promote environmental literacy for current and future generations.

Acknowledgments

We would like to thank the North American Association for Environmental Education (NAAEE), the Association of Nature Center Administrators (ANCA), the National Association for Interpretation (NAI), and their U.S. state affiliate networks for distributing this survey to its members and the environmental education practitioners who spent their valuable time during a global pandemic responding to the survey.

Funding

The study was supported by the National Science Foundation's Advancing Informal STEM Education program (DRL 1906610). Any opinions, findings, conclusions, or recommendations expressed in this material are those of the authors and does not necessarily reflect the views of the National Science Foundation.

References

- Ardoin, N. M., Bowers, A. W., Roth, N. W., & Holthuis, N. (2018). Environmental education and K-12 student outcomes: A review & analysis of research. *The Journal of Environmental Education*, 49(1), 1–17.
- Barreto, R., Rodriguez, L., & Payan, R. (2017). *Deepening commitments: Working toward equity and inclusion when connecting youth to the outdoors*. Youth Outside.
- Bonta, M., DeFalco, T., & Taylor-Smith, C. (2015). *Diversity and the conservation movement*. The National Audubon Society.
- Brownlee, M. T. J., Powell, R. B., & Hallo, J. (2013). A review of the foundational processes that influence beliefs in climate change: Opportunities for environmental education research. *Environmental Education Research*, 19(1),

1–20.

- Collins, M. A., Dorph, R., Foreman, J., Pande, A., Strang, C., & Young, A. (2020). *A field at risk: The impact of COVID-19 on environmental and outdoor science education: Policy brief*. Lawrence Hall of Science, University of California.
- Dale, R. G., Powell, R. B., Stern, M. J., & Garst, B. A. (2020). Influence of the natural setting on environmental education student outcomes. *Journal of Environmental Education Research*, 26(5), 613–631.
- Depper, G. L., Vigil, D. C., Powell, R. B., & B.A, W. (2015-2016). Resource protection, visitor safety, and employee safety: How prepared is the National Park Service? *Park Science*, 32(2), 18–24.
- Dillon, J., Rickinson, M., Teamey, K., Morris, M., Choi, M. Y., Sanders, D., & Benefield, P. (2006). The value of outdoor learning: Evidence from research in the UK and elsewhere. *School Science Review*, 87(320), 107.
- Edwards, M. C., & Briers, G. E. (1999).). Assessing the inservice needs of entry-phase agriculture teachers in Texas: A discrepancy model versus direct assessment. *Journal of Agricultural Education*, 40(3), 40–49.
- Eick, C. J. (2012). Use of the outdoor classroom and nature-study to support science and literacy learning: A narrative case study of a third-grade classroom. *Journal of Science Teacher Education*, 23(7), 789–803.
- Finney, C. (2014). *Black faces, white spaces: Reimagining the relationship of African Americans to the Great Outdoors*. University of North Carolina Press.
- Gruenewald, D. A. (2008). The best of both worlds: A critical pedagogy of place. *Environmental Education Research*, 14(3), 308–324.
- Hudson, S. J. (2001). Challenges for environmental education: Issues and ideas for the 21st century: Environmental education, a vital component of efforts to solve environmental problems, must stay relevant to the needs and interests of the community and yet constantly adapt to the rapidly changing social and technological landscape. *BioScience*, 51(4), 283–288. [Mismatch
- Hungerford, H. R., Litherland, R. A., Volk, T. L., Ramsey, J. M., & Peyton, R. B. (2003). *Investigating and evaluating environmental issues and actions: Skill development program*. Stipes.
- Jose, S., Patrick, P. G., & Moseley, C. (2017). Experiential learning theory: The importance of outdoor classrooms in environmental education. *International Journal of Science Education, Part B*, 7(3), 269–284.
- Keene, M., & Blumstein, D. T. (2010). Environmental education: A time of change, a time for change. *Evaluation and Program Planning*, 33(2), 201–204.
- Ladson-Billings, G. (1995). Toward a theory of culturally relevant pedagogy. *American Educational Research Journal*, 32(3), 465–491.
- Machnik, L. K., Hammitt, W. E., Drogin Rodgers, E. B., & Wright, B. A. (2007). Planning for workforce succession among National Park Service advanced-level natural resource program managers: A gap analysis. *Society & Natural Resources*, 21(1), 50–62.
- Martilla, J. A., & James, J. C. (1977). Importance-performance analysis. *Journal of Marketing*, 41(1), 77–79.
- Marzano, R. J., Marzano, J. S., & Pickering, D. (2003). *Classroom management that works: Research-based strategies for every teacher*. Assoc. for Supervision and Curriculum Development.
- Merritt, E., Stern, M. J., Powell, R. B., & Frensey, B. T. (2022). A systematic literature review to identify evidence-based principles to improve online environmental education. *Environmental Education Research*, 28(5), 674–694.
- Monroe, M. C. (2010). Challenges for environmental education evaluation. *Evaluation and Program Planning*, 33(2), 194–196.
- Monroe, M. C., Plate, R. R., Oxarart, A., Bowers, A., & Chaves, W. A. (2019). Identifying effective climate change education strategies: A systematic review of the research. *Environmental Education Research*, 25(6), 791–812.
- Moseley, C., Summerford, H., Paschke, M., Parks, C., & Utley, J. (2020). Road to collaboration: Experiential learning theory as a framework for environmental education program development. *Applied Environmental Education & Communication*, 19(3), 238–258.
- Muñiz, J. (2019). *Culturally responsive teaching: A 50 state survey of teaching standards*. New America. <https://www.newamerica.org/education-policy/reports/culturally-responsive-teaching/>
- Nation, M. T., & Feldman, A. (2021). Environmental education in the secondary science classroom: How teachers' beliefs influence their instruction of climate change. *Journal of Science Teacher Education*, 32(5), 481–499.
- North American Associate of Environmental Education. (2020). *2020-2023 strategic framework*. North American Association for Environmental Education.
- North American Associate of Environmental Education. (2020). *Guidelines for excellence series*. North American Association for Environmental Education.
- North American Association for Environmental Education. (2017). *Community engagement: guidelines for excellence*. North American Association for Environmental Education.
- North American Association for Environmental Education. (2019). *Professional development of environmental educators: Guidelines for excellence*. North American Association for Environmental Education.
- North American Association for Environmental Education. (2020). *EE certification*. North American Association for

Environmental Education.

- O'Hare, A., Powell, R. B., Stern, M. J., & Bowers, E. P. (2020). Influence of educator's emotional support behaviors on environmental education student outcomes. *Environmental Education Research*, 26(11), 1556–1577.
- Oh, H. (2001). Revisiting importance–performance analysis. *Tourism Management*, 22(6), 617–627.
- Pease, J. L. (2015). Parks and underserved audiences: An annotated literature review. *Journal of Interpretation Research*, 20(1), 11–56.
- Powell, R. B., Depper, G. L., & Wright, B. A. (2017). Interpretation training needs in the 21st century: A needs assessment of interpreters in the national park service. *Journal of Interpretation Research*, 22(2), 19–34.
- Powell, R. B., & Stern, M. J. (2013). Is it the program or the interpreter? Modeling the influence of program characteristics and interpreter attributes on visitor outcomes. *Journal of Interpretation Research*, 18(2), 45–60.
- 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., Passy, R., Pedersen-Gurholt, K., Polley, S., ... Foley, D. (2020). What future/s for outdoor and environmental education in a world that has contended with COVID-19? *Journal of Outdoor and Environmental Education*, 23(2), 93–117.
- Roberts, N. S. (2007). Visitor/non-visitor use constraints: Exploring ethnic minority experiences and perspectives. *Final report: Golden Gate National Recreation Area.*, San Francisco State University.
- Roberts, N. S., & Spears, A. (2020). Connecting the dots: Why does what and who came before us matter? *Parks Stewardship Forum*, 36(2), 173–187.
- Robinson, S., & Garton, B. (2008). An assessment of the employability skills needed by graduates in the College of Agriculture, Food and Natural Resources at the University of Missouri. *Journal of Agricultural Education*, 49(4), 96–105.
- Schultz, C. L., Bocarro, J. N., KangJae, J. L., Sene-Harper, A., Fearn, M., & Floyd, M. F. (2019). Whose National Park Service? An examination of relevancy, diversity, and inclusion programs from 2005–2016. *Journal of Park and Recreation Administration*, 37(4).
- Simon, N. (2016). *The Art of Relevance*. Museum 2.0.
- Simpson, S., Kaufmann, M. C., Glozman, V., & Chakrabarti, A. (2020). Disease X: Accelerating the development of medical countermeasures for the next pandemic. *The Lancet. Infectious Diseases*, 20(5), e108–e115.
- Skibins, J. C., Powell, R. B., & Stern, M. J. (2012). *Exploring empirical support for interpretation's best practices*. *Journal of Interpretation Research*, 17(1), 25–44.
- Stern, M. J. (2018). *Social science theory for environmental sustainability: A practical guide*. Oxford University Press.
- Stern, M. J., Powell, R. B., & Frensley, B. T. (2022). How do environmental education field trips for adolescent youth in the United States influence audiences of different grade level, race, and socioeconomic class? *Environmental Education Research*, 28(2), 197–215.
- Stern, M. J., Powell, R. B., & Hill, D. (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.
- Warner, L. A., Kumar, A., & Lamm, A. J. (2016). Using importance-performance analysis to guide extension needs assessment. *Journal of Extension*, 54(6), 6FEA1.
- Warren, K., & Breunig, M. (2019). Inclusion and Social Justice in Outdoor Education. In Peters M. (Ed.), *Encyclopedia of Teacher Education*. Singapore: Springer.
- Warren, K., Roberts, N. S., Breunig, M., & Alvarez, M. A. T. G. (2014). Social justice in outdoor experiential education: A state of knowledge review. *Journal of Experiential Education*, 37(1), 89–103.
- Weddell, M. S., Fedorchak, R., & Wright, B. A. (2009). Partnership behaviors, motivations, constraints, and training needs among NPS employees. *Park Science*, 26(2), 87–91.
- Weddell, M. S., Fedorchak, R., & Wright, B. A. (2013). Improving national park service partnerships: A gap analysis of external partners. *Park Science*, 29(2), 13–17.
- Woodhouse, J. L., & Knapp, C. (2000). *Place-based curriculum and instruction: Outdoor and environmental education approaches*. Clearinghouse on Rural Education and Small Schools, Appalachia Educational Laboratory.