COLLEGE OF NATURAL RESOURCES AND ENVIRONMENT
FISH & WILDLIFE CONSERVATION
VIRGINIA TECH

VIRGINIA DWR

CONSERVE. CONNECT. PROTECT.

A Comprehensive Overview of Environmental Education

Best Practices for Promoting Belonging, Equity, Inclusion, and Diversity (BEID) in Environmental Education

---

Amelia R. Schmidt, Emily N. Sinkular, Brogan E. Holcombe, Kelsey Jennings, Kaitlyn Theberge

Abstract

Environmental education is the process of growing understanding, skills, and attitudes toward the environment in order to engage individuals in environmental problem-solving. Environmental education efforts were established in the early 1970s as environmental concerns were recognized. Historically, environmental education has not been equitable, inclusive, and diverse, especially in youth programs. Insufficient diversity in environmental education organizations and programs creates a diminished sense of belonging for underrepresented groups in environmental fields. To understand this history and consolidate current research, we conducted a comprehensive literature review on environmental education efforts to highlight common practices in environmental education to determine approaches that would best contribute to a heightened sense of belonging for all participants in environmental education programs. We examined the basics of environmental education–the historical perspectives, curricular aspects, and associated definitions–before moving on to look at the best practices–or instructional standards which contribute to positive results–for environmental education overall. After an in-depth analysis of these two aspects of environmental education, we identified five best practices for increasing belonging, inclusion, equity, and diversity (BEID) in environmental education. Based on the literature, environmental education programs can boost BEID by maintaining flexibility in lesson materials and facilitation, promoting valued instruction through relevant content, acknowledging barriers, performing varied evaluations, and facilitating mentorship opportunities. The practices consist of various instructional, cooperative, and social strategies to enhance already established instructional methods in environmental education so that BEID aspects are emphasized and established. Each of the five practices for BEID are rooted in the best practices for environmental education identified in the second step of our review. All in all, both of these best practice categories have the same core; the only difference is whether or not they are viewed through a lens of diversity, equity, and inclusion. These best practices for BEID tailor programs toward the target audience, making the material more applicable and engaging. A collective solution is required to mitigate modern environmental issues, and this can not occur if only one segment of the population is represented, thus, creating belonging in environmental education is crucial.

A Comprehensive Overview of Environmental Education: Best Practices for Promoting Belonging, Equity, Inclusion, and Diversity (BEID) in Environmental Education

Amelia R. Schmidt[1]*, Emily N. Sinkular[1], Brogan E. Holcombe[1], Kelsey Jennings[1], Kaitlyn Theberge[1]
[1] Department of Fish & Wildlife Conservation, Virginia Tech, Blacksburg, VA, USA
*Correspondence: amelias@vt.edu

Acknowledgements

We value the continued support from members of the Virginia Tech Department of Fish and Wildlife Conservation, specifically the Fish and Wildlife Graduate Student Association's Diversity, Equity, and Inclusion Committee and the Dayer lab. We extend a special thanks to Paige Van de Vuurst, Sharon Dorsey, Jennifer Brousseau, Dr. Kelley Anderson, & Dr. Ashley Dayer for valued feedback, expertise, and guidance on this review. This literature review was funded by the 2022 Wildlife Grant Program from the Virginia Department of Wildlife Resources (DWR) as part of the construction and implementation of inclusive curricula for a student-led after-school wildlife viewing program at a local elementary school.

Table of Contents

Introduction

Environmental education (EE) is an instructional field with the main goals of establishing awareness of the environment, furthering skills of investigation and inquiry, and applying environmental knowledge to make educated decisions and propose solutions to environmental issues (Carter & Simmons, 2010). EE can range from youth through adult education. The roots of EE come from the modern environmental movement in the late 1960s. The United Nations Conference on the Human Environment in 1975 brought about the first detailed definition of EE, including objectives, goals, and principles that EE efforts should strive towards. After some conflicting views in the 1980s regarding EE materials, EE became more established in the United States with the passage of the National Environmental Education Act (NEEA) in 1990. In this review, we offer a comprehensive overview of EE including historical aspects, the foundations of EE curricula, general best practices for EE programs, and best practices to build belonging in EE for underrepresented groups.

Endeavors in EE aim to promote environmental literacy, or to support informed decision-making and action. To achieve this goal, best practices, or those that contribute to positive program outcomes, may be used in EE programs. These programs can strive to include the concept of place as a basis of learning, facilitation of connections, collaborative work (Stern et al., 2014), and other best practices to increase program effectiveness. These practices may also contribute to the promotion of belonging, equity, inclusion, and diversity (BEID) (*Table 1*).

EE programs predominantly attract affluent, white individuals (McLean, 2013) and although there are efforts to increase diversity, inclusion is not prevalent in most EE organizations (*see Appendix B*). In order to make EE programs equitable and inclusive for all groups, educators and program facilitators must consider how different groups will experience the program and engage in the content. They must also consider the performance of their evaluation methods, the barriers that prevent participation, the program's learning atmosphere, and the support systems in place for the students. Best practices to address these considerations can be employed to ensure programs are equitable and inclusive for all groups.

Table 1. Summative view of common best practices for EE programs

This table is a high-level, non-comprehensive overview of the major takeaways of this review. It consists of a summative view of overlapping aspects from the objectives of EE highlighted in the Tbilisi Declaration, best practices for promoting positive outcomes in EE programs, and best practices for promoting belonging, equity, and inclusivity for diverse groups in EE. An "X" mark in the column labeled for belonging, equity, inclusion, and diversity (BEID) that means literature exists that supports each category as practices that may promote BEID. It is highly recommended to reference the full tables in the later sections for a deeper understanding of these topics.

Objective	Explanation	BEID
Awareness of interdependence	Acknowledge the sensitive nature of the environment and how it is interconnected to developmental, economic, social, political, and environmental processes in local, regional, and wide-scale areas	X
Provision of opportunities and participation	Provide everyone with chances to gain awareness, knowledge, skills, attitudes, and values about the environment through active, student-led involvement towards a solution to environmental issues	X
Knowledge and skills	Gain relevent experience and an understanding of environment, identify and solve environmental problems and develop skills in self-efficacy, social skills, investigation, data collection, and inquiry	
Creation of patterns and attitude	Acquire values for the environment and create patterns of behavior towards the environment	
Cooperation	Emphasize the need for communication and cooperation among different levels of affairs (local, national, global) and between generations	X
Active and experiential engagement	Issue-based, project-based, and/or investigation-focused hands on learning experiences that utilize a variety of approaches, preferably in an outdoor setting	X
Place-based learning & connections	Focus on specific topics and/or issues relating to a local setting, form emotional and intrapersonal connections, and link subject matter to real-world and real-life problems	X
Interdisciplinary and holistic experience	Teach subject matter encompassing a bigger context through balance between disciplines, sources, and perspectives	X
Complexity and causes	Aid in student discovery of the cause and effect of complex environmental issues and their potential solutions	
Evaluation	Consideration of varied evaluation methods and considerations of barriers of implementing proper evaluation both inside and outside a program	X

Section 1: The Role of Environmental Education in the Natural Resources Field

Environmental Education

Definition of Environmental Education

Environmental education (EE) is education "in, about, and for the environment" (Meredith et al., 2000). EE is a learning process that promotes environmental literacy through the spread and application of environmental knowledge (Carter & Simmons, 2010) to promote positive environmental behaviors and views. Positive, or pro-environmental, behavior (PEB) is a term referring to the behaviors one chooses that do not have a significant negative impact on natural resources or the environment or that aid in the sustainability of natural resources. This term is highly relative and varies in definition and standard across the literature (Schultz & Kaiser, 2012). Beyond promoting PEBs, environmental literacy enables individuals to make informed decisions about how to manage environmental problems, engage in stewardship, and form opinions on policies and actions impacting the world around them.

Challenges of Integration into Classroom Education

EE is a lifelong learning process that can start at a young age and continue into adulthood. Traditionally-structured classroom educators, however, often experience difficulty working EE into the common curricula due to a lack of prioritization of EE in core-curricular requirements, variation in age group requirements, and educational settings (Meier & Silsk-Hilton, 2017). Traditional school curricula are often lacking in resources, organized EE curricula (Hungerford et al., 1980), and common program goals (Blatt, 2015). The resulting EE programs are fragmented in nature and are not effective in terms of behavior change, a key target of EE, as a result (Ramsey, 1993).

Historical Perspectives

International Influences

International forums in the 1960s, such as the Conference for the Establishment of the International Union for the Protection of Nature (IUCN), set the stage for environmental action in the 1970s in which a boom of modern environmental law and policy in addition to greater consideration of the environment in public health and welfare took place. In 1975, the Stockholm Conference, also known as the United Nations Conference on the Human Environment, brought the importance of EE to light (Carter & Simmons, 2010). The Tbilisi Declaration (1977), reformed from the Belgrade Charter (1975), provides a framework of goals, objectives (*Table 2*), and guiding principles (*see Appendix A*) for EE programs (*Tbilisi Declaration (1977)*, n.d.). The declaration also provided the most well-accepted definition of EE and its goals:

> *"The goal of environmental education is to develop a world population that is aware of and concerned about, the total environment and its associated problems, and which has the knowledge, attitudes, skills, motivation, and commitment to work individually and collectively toward solutions of current problems and the prevention of new ones"* (*Barry*, 1976).

This statement and the accompanying declaration set the stage for international action concerning EE efforts and marked a milestone in the global development of EE.

Table 2. EE targets and objectives endorsed by the Tbilisi Declaration

(*Tbilisi Declaration (1977)*, n.d.)
The following table displays targets and objectives of EE as endorsed by the Tbilisi Declaration. This Declaration highlights recommended standards for EE.

Targets & Objectives	**Explanation**
Awareness of interdependence	Acknowledge the interconnected nature of economic, social, political, and environmental processes in local, regional, and wide-scale areas
Provision of opportunities	Provide everyone with chances to gain awareness, knowledge, skills, attitudes, and values about the environment
Creation of patterns	Create positive patterns of behavior towards the environment
Awareness	Acquire an awareness and sensitivity to the natural environment and its problems
Knowledge	Gain experience and an understanding of the environment
Attitude	Acquire values and feel concerns regarding the environment and its problems
Skills	Identify and solve environmental problems
Participation	Provide opportunities for active involvement to work towards finding resolutions to environmental problems

Influences in the United States

In the U.S. after recommendations from President Nixon's Advisory Council and Congressional approval, the Environmental Protection Agency (EPA) was created and in action by December of 1970 (U.S. Environmental Protection Agency, 2021b). Along with these pivotal policy changes, a study by the National Science Teachers Association on the need for better EE efforts prompted former President Nixon to sign the first Environmental Education Act (EEA) in 1970. A lack of funding and a limited time frame, unfortunately, led to EEA only operating for a few years. The EEA, therefore, had limited impact on EE efforts in the U.S., but it did set the stage for future federally backed EE efforts (Carter & Simmons, 2010).

The Reagan administration (1981-1989) significantly reduced federal efforts to support EE with the Omnibus Budget Reconciliation Act (OBRA) in 1981 which eliminated the 1970 Nixon-era EEA (Carter & Simmons, 2010). The Reagan administration instituted industry environmental rollbacks which diminished the environmental advances of the '60s and '70s. The George H. W. Bush administration (1989-1993) began an era of mixed support of EE. During the George H. W. Bush administration, and

into the following Clinton administration (1993-2001), environmental concerns were reestablished in the federal government. In 1990, President George H. W. Bush enacted the National Environmental Education Act (NEEA). This Act was similar to Nixon's 1970 Environmental Education Act and elaborated on federally backed EE efforts and remains in effect today. The NEEA aimed to promote EE and environmental literacy in the U.S. by creating the Office of Environmental Education, Environmental Education Advisory Council and Task Force, and the National Environmental Education Foundation, and offers grants, training, and internships (U.S. Environmental Protection Agency, 2021a). However, some groups maintained criticism of EE, asserting that it promoted a one-sided and biased agenda (Carter & Simmons, 2010).

Despite the federal government's overall hesitancy surrounding EE, it has consistently supported EE at different scales. Before 1990, programs and initiatives occurred primarily through non-governmental organizations (NGOs, Carter & Simmons, 2010), and many educators still promoted outdoor engagement to their students for the physical, mental, and behavioral benefits of such activities, although it was not a curricular requirement (Carter & Simmons, 2010). Time spent outdoors engaging in EE-related experiences can increase attention spans, lead to behavioral and educational outcome benefits, reduce stress (Meier & Silsk-Hilton, 2017), and can significantly reduce anxiety (Rian & Coll, 2021) in students. In more recent years, EE is becoming more commonly acknowledged as an important part of education in classroom settings due to these potential benefits (Meier & Silsk-Hilton, 2017), as well as in residential programs such as summer camps (eg. Stern et al., 2010).

Environmental Education Curricula Development

Basics of EE Curricula

EE programs most typically consist of curricula that are largely information-based, relying on increasing students' knowledge of the environment and its issues (Hungerford et al., 1980; Liefländer et al., 2013). While the dissemination of knowledge is an important part of EE, strictly information-based EE programs do not lead to changes in environmental attitudes and behavior (Blatt, 2015; Liefländer et al., 2013) as strictly fact-based programs do not build environmental action or literacy (Hungerford et al., 1980). Relevant environmental knowledge should be intertwined with activities to strengthen students' environmental capability and literacy such as through stewardship activities that engage students in environmental issues and participating in citizen scientist opportunities that apply knowledge and skills to work towards a collective goal.

EE Program Targets

EE curricula should promote the targets and objectives of the programs (Ramsey et al., 2010). Several targets and objectives have been set forth in regard to implementing effective EE curricula. The Tbilisi Declaration endorses a few broad, all-encompassing targets and objectives (*Table 2*) for EE programs. A few common targets for EE programs are described in further detail below.

Opportunities for Inquiry and Empowerment

Opportunities for inquiry, such as the pursuit of answers, investigation, and research, strengthen student learning, engagement, and curiosity concerning the environment. EE programs should encourage

inquiry among students in all experiences, from everyday activities to larger ones (Payne, 2006), and question the possible relations between the two. These considerations allow students to gain a better understanding of the environment and form personal opinions (Athman & Monroe, 2001). As students progress in EE, they will gain a sense of control and self-efficacy relating to environmental issues (Stern et al., 2014). This control built from knowledge, skills, and experiences boosts a sense of empowerment in students as they realize that they can make a difference (Athman & Monroe, 2001; Blatt, 2015).

Balanced Perspectives

Balanced perspectives ensure EE programs consider all relevant sides to a story. Environmental issues are multifaceted with multiple, complicated drivers. To assign blame to a single industry or factor for an environmental issue would not provide an accurate education. Instead, educators should consider differing perspectives, opinions, and scientific information to ensure the development of balanced and unbiased EE (Athman & Monroe, 2001; Meredith et al., 2000; Blatt, 2015).

Clear Objectives and Goals

Clear objectives are an important standard for all EE. A lack of clear goals and objectives for educational content makes it hard for educators to determine and identify desired outcomes (Blatt, 2015). With goals explicitly stated, EE programs are more cohesive in nature to guide students toward environmental literacy and capabilities. Goals for programs can be short-term and long-term. Short-term goals lay out what each lesson or activity will accomplish while long-term goals detail how the goals contribute to the overall objectives of the program (Hungerford et al., 1980).

Accurate Information

Common criticisms of EE include providing students with inaccurate information from outdated texts, misinformation from media sources, and a sense of hopelessness relating to environmental problems. To mindfully incorporate solutions to these critiques, EE should focus on empowering students to thoroughly understand the issues and identify solutions. Guidelines by the North American Association for Environmental Education (NAAEE) were developed in response to these concerns in 1996 to ensure the increased accuracy of EE programs (Athman & Monroe, 2001). The guidelines provide recommendations based on the Tbilisi Declaration's goals (*Table 2*) for educators to follow in order to evaluate educational materials (see Simmons et al., 2004).

Section 2: Best Practices in Environmental Education

Best Practices in EE

Introduction to Best Practices

Best practices, or the pedagogical techniques implemented to result in positive outcomes, can increase program effectiveness when properly implemented. Successful pedagogical practices for general education are at the core of the proper implementation of EE (Meredith et al., 2000); however, so-called best practices of education may not benefit all students. Due to this important distinction, please see the "*Section 4: Best Practices to Increase Belonging and Create More Diverse, Equitable, and Inclusive Environmental Education*" of this review for best practices for equitable and inclusive EE.

Generally speaking, EE programs should follow a few simple guidelines relating to course content. After criticism of EE in the late 1980s, as addressed in "*Section 1: The Role of Environmental Education in the Natural Resources Field*", the NAAEE published a series of guidelines for success in EE (see Simmons et al., 2004). The NAAEE guidelines for success developed basic standards for EE and eventually grew into the *National Project for Excellence in Environmental Education* which lays out the benchmark guidelines, knowledge, and evaluation methods that should be employed in EE programs (Carter & Simmons, 2010).

The NAAEE guidelines for K-12 education are categorized into four strands *(Table 3,* see Simmons et al., 2004*)*: inquiry, environmental knowledge, understanding and addressing issues, and environmental responsibility as detailed in *Table 3* (see Simmons et al., 2004). Overall, these four strands provide a framework for establishing environmental literacy and set standards for EE practices in formal and informal settings (Simmons et al., 2004). Strand 4, Environmental responsibility, is especially important as it enables students to counter pessimistic views on environmental problems and "learned helplessness," which are common in society as many do not believe they can have an impact on environmental problems at such a large scale (Nagel, 2005).

Table 3. Strands of topics for course content

The following table depicts a summary of the four strands of EE content derived from the *NAAEE K-12 Guidelines for Excellence in EE*

Strand	**Objectives of Strand**
Inquiry	Development of skills involving curiosity, questioning, collecting information, interpreting data, synthesizing sources, constructing hypotheses, and communicating findings
Environmental knowledge	General understanding of environmental, human, and societal systems, the influence of other factors in these systems, and the development of skills involved in transdisciplinary integration for identification and action on environmental concerns
Understanding & addressing issues	Application of knowledge to environmental issues, identification of issues, discovery of potential solutions, identifying consequences of action, and evaluation of results
Environmental responsibility	Recognition of responsibility, necessity of taking action on conclusions concerning environmental issues, and realization of the importance of individual and group efforts Establishment of a sense of self-efficacy in acting on environmental issues

Best Practices Based on Literature

While best practices in EE are well studied, it is challenging to quantify the elements that make an EE program successful due to individual program uniqueness, limited availability of quantifiable data, and variety of evaluation methods used (Stern et al., 2014). Nonetheless, many practices result in positive outcomes when implemented. The overlap between the Tbilisi Declaration recommendations (*see Appendix A and Table 2*) and best practices of effective EE programs *(Table 4)* are outlined as overall best practices for EE and are described in further detail below. Supporting references are also included.

Table 4. Effective EE practices derived from literature

The following table exhibits practices that result in positive EE program outcomes when implemented.

Category of Practice	**Explanation**	**References**
Place-based Education	Focus on specific topics and/or issues relating to a local setting	(Athman & Monroe, 2001; Payne, 2006; Stern et al., 2014; *The Benefits Of-Based: A Report From the Place-Based Education Collaborative*, 2010; Vaske & Kobrin, 2001)
Facilitation of Connections	Link subject matter to real-world and real-life problems and form emotional and social connections	(Barrable, 2019; Liefländer et al., 2013; Meredith et al., 2000; Stern et al., 2014; Stern et al., 2010)
Cooperative and Collaborative Group Work	Build social skills, intergenerational communication, and establishment of teachers as role-models	(Athman & Monroe, 2001; Payne, 2006; Stern et al., 2014; Vasconcelos, 2012)
Educational Setting	Engage with nature and course materials in an outdoor setting	(Athman & Monroe, 2001; Dale et al., 2020; Meredith et al., 2000; Stern et al., 2014)
Student Empowerment	Develop skills and belief in self-efficacy	(Athman & Monroe, 2001; Palmberg & Kuru, 2002; Stern et al., 2014)
Interdisciplinary and Holistic experience	Engage in an interdisciplinary approach and teach subject matter in a bigger context through a variety of activities	(Meredith et al., 2000; Stern et al. 2010; Stern et al., 2014)
Type of Instruction	Instructor displays passion for subject, non-verbal skills, and genuine care and concern for students	(O'Hare et al., 2020; Stern et al., 2014)
Active and Experiential Engagement	Experience issue-based, project-based, and investigation-focused, hands-on learning	(Powell & Wells, 2002; Stern et al., 2014)
Inquiry	Promote investigation, data collection, and questioning of topics	(Athman & Monroe, 2001; Stern et al., 2014)

Creating Place-based Education

Place-based learning, or relating a program to a familiar setting and the students' own lives, increases relevance to students and is associated with more successful programs (Cincera et al, 2015; Dale et al., 2020; Stern et al., 2014). EE programs that utilize place-based learning encourage individuals to actively engage with their local environments, improve individuals' connection to their communities, and prompt local positive environmental action (*The Benefits Of Place-Based: A Report From the Place-Based Education Collaborative*, 2010; Vaske & Kobrin, 2001). EE learning that is applied to a local context provides the basis for the education of larger systems and forges connections to the community

which becomes embedded in environmental learning (Athman & Monroe, 2001; Cincera et al, 2015; Palmberg & Kuru, 2002). This concept goes hand-in-hand with the importance of making connections.

Facilitating Connections

Connections to everyday life, EE course materials, home environments, cultures, and social structures are vital topics in EE. These connections engage students in lessons that they can relate to. By linking course content to home life and lived experiences, teaching becomes culturally responsive, and thus more effective in the populations toward which the cultural relevance is directed (Stern et al., 2010). Emotional connections also play a role in the success of programs through community, peer, and other social interactions, as well as those with animals (Stern et al., 2014). Additionally, personal connections that place value on nature and natural systems are important. Values and emotions, when coupled with knowledge, prompt environmentally responsible actions (Barrable, 2019; Palmberg & Kuru, 2002). Connectedness to nature forms the basis for environmental attitudes (Barrable, 2019; Bruni and Schultz, 2010, as cited in Liefländer et al., 2013) and thus EE programs should elicit connections that are relevant to the students' lives. This may cause them to form new opinions and attitudes toward the environment, and encourage pro-environmental actions (Barrable, 2019; Liefländer et al., 2013; Stern et al., 2014).

Promoting Cooperative and Collaborative Group Work

Cooperative and collaborative EE programs may lead to better engagement, learning, and skill development (Vasconcelos, 2012). Cooperative learning allows for group discussion, encourages exploration of ideas and concepts, and aids in learning (Athman & Monroe, 2001; Vasconcelos, 2012). Social interactions can help facilitate environmental identity which impacts youth engagement in environmental stewardship (Stapleton, 2015) and aids in the development of social competencies (Vasconcelos, 2012). EE learning in a collaborative atmosphere allows for collective inquiry and the ability for students to learn and gain different perspectives from their peers (Payne, 2006; Vasconcelos, 2012). Intergenerational communication and engagement between teachers and students create a more positive experience. Teachers can serve as role models for their students, and this factor can play an important role in learning and environmental literacy development (Stern et al., 2014).

Considering Aspects of the Educational Setting

EE programs set in an outdoor environment are shown to be more effective than indoor programs (Dale et al., 2020; Stern et al., 2014) as these programs provide students with hands-on experiences, enjoyable lessons, and increase perceived connectedness to nature (Liefländer et al., 2013). While children’s participation in nature activities correlates strongly with adult pro-environmental attitudes and behaviors (Wells & Leikes, 2006), children today are only spending half as much time outdoors compared to those 20 years ago. This so-called “nature deficit” can affect health, well-being, and conservation efforts (White, 2008). As development and urbanization continue, students will have fewer opportunities to get hands-on experiences in the natural world. However, this is not an end-all-be-all issue (Athman & Monroe, 2001). Learners in urban environments still can participate in EE programs and these programs may be uniquely impactful on urban students’ lives (Stern et al., 2010). For example, a UK-based program “Bird Buddies” targeted urban youth and resulted in increased awareness and interest in wildlife (White et al., 2018).

Empowering Students

The promotion of self-efficacy and individual empowerment in students contributes to successful outcomes in EE programs (Stern et al., 2014) by giving students the skills and tools to take personal and civic action and make a change in their communities (Athman & Monroe, 2001). Acquisition of knowledge and experience in nature improves self-confidence in students which may ultimately lead to increased drive or motive to further engage in nature (Palmberg & Kuru, 2002). To support student empowerment, EE programs should consider invoking a sense of self-efficacy in learners and emphasizing that students can make a difference in the world around them.

Providing an Interdisciplinary and Holistic Experience

Interdisciplinary and holistic methods (Stern et al., 2014) increase program relevancy and reduce program bias. A holistic approach can take many forms including multimedia displays to address challenges students may face, such as domestic violence and drug use (eg. Stern et al., 2010) or simply through nature journaling (Tsevreni, 2021). The interconnection of these societal issues with environmental concepts forges connections between the environment and home life which helps students make informed decisions about their own futures as well as the environment's (Stern et al., 2010). Holistic experiences provide learning material in the context of how EE relates to the bigger picture. Studies have shown programs in which the students take an active role in a bigger story successfully increase understanding of the factors at play, make the program more relevant to the students' lives, and provide a clear-cut objective for the lesson (Stern et al., 2014). Implementing an interdisciplinary approach to EE helps increase sustainability education (Pearson et al., 2008), implying that this approach might aid in other forms of EE as well.

Acknowledging Instructional Technique

The learning atmosphere is an important aspect of EE programs. A teacher's identity and teaching style can promote positive outcomes. Their involvement, concern for the students, enthusiasm, and support have been associated with better appreciation and intentions regarding the subject matter (O'Hare et al., 2020; Stern et al., 2014). Student-centered and student-led learning helps students develop self-efficacy and skills beyond those pertaining to environmental knowledge. Furthermore, play-based learning keeps students engaged through games and competitions (Stern et al., 2014). In a study on play-based instruction, it was shown that when various types of engagement were combined together, such as open-ended play, modeled play, and teacher-student interaction, it provided multiple teaching opportunities to make connections between environmental concepts and traditional classroom curricula. This suggests that play-based learning can bridge the gap between EE and formal teaching methods (Cutter-Mackenzie & Edwards, 2013).

Implementing Active and Experiential Learning

Active learning, or "issue-based, project-based, and investigation-focused programs in real-world settings" results in positive outcomes in EE programs (Stern et al., 2014). Kolb's learning cycle, a key representation of experiential learning, states that knowledge is created through experience. The learning cycle describes learning as a process of experience, followed by observations and reflections, formation of concepts, and the testing of those concepts which leads to more experiences (Vince, 1998). This cycle may be considered in understanding experiential learning to a higher degree.

Problem-based learning that involves analysis of real-world issues keeps the course material relevant to the students and increases retention, understanding, and student interest (Vasconcelos, 2012). Participation in hands-on EE programs promotes retained connections and awareness of environmental concepts, is more likely to have a long-term impact on students (Hanneman, 2013; Liefländer et al., 2013), and aids in the recollection of past experiences (Knapp & Benton, 2006). Overall, the integration of experiential learning in curricula increases student knowledge, may influence environmental attitudes and actions and helps meet goals of environmental literacy (Powell & Wells, 2002).

Recognizing Levels of Inquiry

Key aspects of learning include asking questions, making conclusions, and investigating an issue. In EE, the topic of inquiry is viewed in the scientific sense where students are either asked to develop a research question and methods for addressing that question (pure inquiry) or answer a question asked by educators (guided inquiry) (Stern et al., 2014). Successful EE programs encourage students to ask worthwhile questions to promote curiosity among participants (Athman & Monroe, 2001; Stern et al., 2014).

Evaluation of EE Programs

Introduction to Evaluation

Evaluation can be described as the "systematic collection of information about the activities, characteristics, and outcomes of programs to make judgments about the program, improve program effectiveness, and/or inform decisions about future programming" (Patton, 1997, as cited in Athman & Monroe, 2001). Program evaluation gained traction during the 1960s and 1970s when it was used to determine funding resources for newly-instituted governmental social programs. Evaluation then shifted from solely funding-focused to include effectiveness-driven evaluations as well (Athman & Monroe, 2001). Evaluation of EE programs is a necessary step in making sure programs are successful and meaningful to students and to ensure a program is reaching its goals. Without proper evaluation, assessments of programs are anecdotal at best and the data gathered are unable to be compared or applied to other programs (Powell et al., 2006). Despite the importance of evaluation, EE professionals do not often implement it due to barriers to access and program diversity (Carleton-Hug & Hug, 2010; Powell et al., 2006).

Evaluation Tools and Frameworks

Methods of Evaluation

Evaluations can be performed after a program is completed (summative evaluation), done throughout a program's implementation (formative evaluation, Athman & Monroe, 2001; Meredith et al., 2000), or prior to development (front-end evaluation, Meredith et al., 2000). The time frame of an evaluation is an important consideration, with short-term evaluations being more common than long-term evaluations often because of feasibility and resource availability (Stern et al., 2008) despite the importance of long-term follow-up to determine how sustainable and effective EE programs are. In a case study done by Stern et al. (2010), long-term follow-up indicated students' attitudes towards school were

positive in the short term, but these attitudes were not sustained long-term. The decrease in positive attitudes long-term was likely due to intervening factors, however, the direct cause is ambiguous. These results indicate that the program should make adjustments to attempt better long-term results, such as forging deeper connections to lived experiences (Stern et al., 2010). As demonstrated through this case study, continued and consistent evaluation is necessary to determine program retention and success. EE directors need to evaluate the effectiveness of programs in contributing to environmental literacy, both short-term and long-term.

Several pre-existing standardized evaluation tools exist that may be used in EE evaluations to save time and effort (Anderson, 2021). Such tools include NAAEE's environmental education evaluation (eeVAL) (North American Association for Environmental Education, n.d.), which offers tools for evaluating equitable and inclusive programs *(see Section 4, Culturally Responsive Evaluation)*, the IUCN Commission on Education and Communication Evaluating Environmental Education book (Stokking et al., 1999) which offers steps, guidelines, and examples of evaluation, and My Environmental Education Evaluation Resource Assistant (MEERA) (My Environmental Education Evaluation Resource Assistant, n.d.) which depicts steps on planning evaluation and provides sample evaluations, and Environmental Education in the Twenty-First Century (EE21) which assesses EE outcomes through a survey (Powell et al., 2019).

Measuring Outcomes

Ideally, evaluation uses authentic assessments to measure program outcomes. These assessments involve learners taking an active role in the assessment, creating tasks that depict a broad range of knowledge. Example assessments of program outcomes to aid in program evaluation may include: 1) observations of behaviors, 2) interviews with learners, 3) knowledge charts depicting what a student wants to learn and what they know before and after the program, 4) concept maps constructed by students, 5) performance assessments, 6) presentations, 8) projects, and 9) portfolios (Meredith et al., 2000). Many programs gather immediate feedback in order to evaluate programs; however, feedback alone does not constitute true evaluation. Program evaluation should measure the intended outcomes of a program, whether the target audience retained the content, and any changes in the audience's opinions, attitudes, and behaviors. These program evaluations may be performed through questionnaires, interviews, focus groups, observations, numerical counts, content analysis, or case studies (Meredith et al., 2000).

Challenges to Evaluation

Resistance to Evaluation

Resistance inside an organization hinders evaluation due to a lack of understanding of what evaluation is and what it entails (Carleton-Hug & Hug, 2010). Individuals in an organization may associate evaluation with assessment, which has a negative connotation. The distinction between the two terms should be made clear in order to prevent negative views on evaluation attempts (North American Association for Environmental Education, 2019).

Resource Considerations

Systematic, in-depth evaluations are needed for EE programs to measure success, but it often requires expertise and resources that a program does not have. This forces the program of interest to search for outside evaluators, which may be costly and time-consuming (Powell et al., 2006). Of EE programs that do perform evaluations, those evaluations are often summative in nature. While summative evaluation can be insightful, relying on one form of evaluation alone does not give a comprehensive view of what the program can alter to produce the best outcomes (Carleton-Hug & Hug, 2010). Rather than focusing on one type of evaluation method, such as pre- and post-program surveys, EE programs should consider using a multiple-evaluation approach, like the Sustainable Evaluation Framework (SEF). SEF uses a utilization-focused, participatory, theory-driven, and consumer-based approach to provide for a "rigorous, self-sustaining, adaptive, and methodologically appropriate evaluation system" (Powell et al., 2006).

Program Variability

The complexity of the EE field makes evaluation difficult. Evaluation often measures the unique qualities of different programs, which limits the compatibility and comparison of program evaluations (Stern et al., 2014). The lack of consistent program objectives makes evaluations of programs tough to perform. As stated previously, effective EE programs need clear objectives to make for cohesive learning and curricula (Athman & Monroe, 2001). A vital and required part of evaluation is to measure success towards a certain objective (Carleton-Hug & Hug, 2010). Similarly, if activities are independent of the program objectives, evaluations will produce outcomes independent of the program's goals, thus rendering results ineffective. Overall, if program goals are missing or unclear, then evaluating a program's effectiveness becomes particularly difficult to pursue (Carleton-Hug & Hug, 2010).

Time Frames

The time frame of an EE program may also pose barriers to evaluation. While longer time frames are needed to determine a program's sustainability, many EE programs are relatively short in duration due to administrative, budgetary, or logistical concerns (Carleton-Hug & Hug, 2010). As mentioned above, most EE programs rely on pre- and post-experience surveys because they are not able to perform longer-term evaluations. The results of these surveys may not reflect future behaviors or actions (Stern et al., 2008), skewing the evaluation. To mitigate this barrier, researchers recommend that other evaluation frameworks be employed, like SEF (Carleton-Hug & Hug, 2010).

Confounding Factors

Confounding factors such as information sources, social environments, and various cultural differences may also pose a barrier to evaluation. Students in EE programs hail from various contexts and backgrounds, so evaluation must account for this diversity (*see "Section 4: Best Practices to Promote Belonging and Create More Diverse, Equitable, and Inclusive Environmental Education" for more information*). Likewise, evaluation should account for possible misinformation. Research indicates that children acquire most of their knowledge about the environment from media sources such as the Internet or television, while for most adults, these media sources are the sole mode of acquiring environmental knowledge (Carleton-Hug & Hug, 2010). Likewise, 80% of Americans were shown to be "heavily influenced by incorrect or outdated environmental misconceptions" (Carleton-Hug & Hug, 2010). It is recommended that all educators prepare students before an activity in order to increase evaluation result validity through standardization (Carleton-Hug & Hug, 2010). Overall, evaluations of EE should take into account the possibility of misinformation and its potential effect on attitudes and behaviors.

Section 3: Understanding How to Promote Belonging in Environmental Education to Address Systemic Diversity, Equity, and Inclusion Issues

Overview of Diversity, Equity, and Inclusion in the Environmental Education Field

Framing of the Language

The common phrase "diversity, equity, and inclusion", often abbreviated as "DEI", is becoming increasingly prevalent in many industries (Angel et al., 2021) in an effort to promote a safe workspace that everyone has access to, regardless of their race and/or ethnicity, sexual orientation, gender identity, or ability. Focus on DEI initiatives in a corporate setting began in the 21st century, making it a relatively new venture (Garg and Sangwan, 2021). The use of the phrase itself–"diversity, equity, and inclusion"–is controversial as it brings the mindset of inviting underrepresented groups to the table instead of valuing their contributions from the start (North American Association for Environmental Education, 2020). Author of *Equity in Sustainability*, Angela Park, speaks on issues with this terminology:

> *"I don't think we should be calling this diversity, equity, and inclusion work and…[we] should not be calling it DEI. If you're going to do this work and you're going to embed it into your organization, you have to talk in full sentences, full coherent sentences that resonate with other people so they actually know what you're talking about…" (North American Association for Environmental Education, 2020)*

Park speaks on this issue by highlighting language burnout, or the loss of meaning with overused terms or phrases. Announcements and statements about intent to promote DEI initiatives do not always translate into concrete actions. Using the phrase "diversity, equity, and inclusion" or simply making a DEI statement without acting to resolve the deep-rooted, systematic issues present renders the term null (Bourgault & Corcran, 2021). Park recommends that organizations develop unique language that follows their own mission in regard to this issue instead of using the overused term "diversity, equity, and inclusion" (North American Association for Environmental Education, 2020).

A common theme related to diversity, equity, and inclusion terminology is establishing and clarifying language use (North American Association for Environmental Education, 2020). Framing of language is a flexible, ever-changing process. Terminology constantly changes as terms acceptable in the past can become outdated quickly. Regarding disabilities, euphemisms, like "handicapable", are heavily frowned upon (North American Association for Environmental Education, 2022*)*; however, there is much debate within the community over the use of person-first language versus identity-based language. Person-first language is terminology that puts the individual first, such as describing an individual as a "person with a disability." Identity-first language puts the individual's identity before the disability, such as "disabled person" or "deaf individual". Most disabled individuals prefer identity-first language, as it puts the person's identity before themselves. Syren Nagakyrie, the founder of Disabled Hikers speaks on person-first and identity-first language in the disability community as follows:

> *"What [person-first language] can often do is separate the person from the disability…disability is the only identity that uses person-first*

> *language. For example, we don't say 'I am a person with gayness' I am just a gay person…It's really important to keep in mind like why is it that disability is the only identity that uses this language?...There was a lot of conversation about the language that we use to talk about disability to remove the stigma…It is acceptable to use person-first language…but many disabled folks do prefer identity-focused language…it centers disability as the core part of someone's identity…I am a disabled person. I cannot separate that from who I am…" (North American Association for Environmental Education, 2022)*

For the sake of this paper, the phrase BEID will be used. This review aims to identify barriers to diversity in EE, make EE equitable to all individuals, create EE practices that are inclusive to all groups, and promote a sense of belonging in EE. See *Appendix C* for additional and clarifying terminology that is utilized in this paper.

Misconceptions

Misconceptions regarding interest and involvement in the environment and environmental education by people of color are common (Lewis & James, 1995). Many studies have examined how racial differences, especially among Black individuals, affect attitudes pertaining to the environment and environmental issues (Lee, 2008; Quimby et al., 2007; Adeola, 2004; Johnson et al., 2004; Mohai, 2003; Sheppard, 1995). The literature often disagrees on the level to which Black individuals are interested in environmental issues. Some argue that Black individuals are interested (Anderson, 2021; Adeola, 2004; Mohai, 2003; Lewis & James, 1995; Sheppard, 1995); while others argue that Black individuals are less interested and concerned regarding the environment (Lee, 2008; Quimby et al., 2007; Johnson et al., 2004). These misconceptions about the level of concern Black individuals feel for the environment are derived from a variety of social and economic factors (Adeola, 2004). It is important to consider that individuals from a variety of backgrounds may value the environment in different ways than white individuals (Sheppard, 1995). Sheppard (1995) suggested that Black individuals appreciate the environment in a practical sense based on what it can do for humans, while white individuals value the environment more for aesthetic and appreciative reasons. Similarly, Asian individuals in the U.S. are more likely than white individuals to value the environment based on intrinsic values in that "the wilderness should exist for its own sake" (Johnson et al., 2004). Furthermore, modern Western ideologies separate nature from humans, where nature is an object to be taken advantage of for production and resources. Indigenous views of nature are founded on interconnectedness. This perspective views nature and humans as connected and is based on reciprocity in that humans safeguard nature, and in return, nature provides for humans (Mazzocchi, 2020). These differing perspectives contribute to different participation and points of view on conservation and environmentalism as a whole. Environmentalism is often associated with well-educated and white populations. This mindset perpetuates beliefs about which groups truly belong in the environmental movement and thus impacts the involvement of the greater population (Pearson et al., 2018).

Some studies and reviews have argued that individuals from ethnic minority backgrounds are less concerned about environmental issues (Lee, 2008; Quimby et al., 2007; Johnson et al., 2004); however, the framing of evaluation methods surrounding these questions of involvement must consider the different

values, barriers to the same appreciation of the environment, and language implemented to avoid biases (Lewis & James, 1995). Some sources have stated that, when compared to white individuals, people of color exhibit less concern about the environment (Quimby et al., 2007), had less positive environmental engagements, and more negative views on the environment (Johnson et al., 2004). These results must also take into account access limitations, such as those due to lower incomes. This may lead to a lower connection to the environment, and thus less concern for it (Liefländer et al., 2013) as research has shown that higher levels of connection to the natural world lead to the construction of environmental attitudes and behaviors (Barrable, 2019; Palmberg & Kuru, 2002). Thus, if these demographics had equal access to the outdoors, environmental interest and action would likely be seen at higher levels. Likewise, Quimby et al. (2017) concluded that individuals from ethnoracial minority backgrounds had less interest in environmental careers due to perceived barriers and various contextual factors associated with such careers. Those from minority backgrounds do not exhibit less concern because of an intrinsic dislike of the environment, but rather due to deep-rooted biases and barriers to equal access to the environment and opportunities for engagement among others. These barriers to involvement in environmental careers (*see Appendix B*) and access must be considered when analyzing minority individuals' involvement and interest in the environment.

The misconception that issues in EE appeal to everyone and addresses the gap between the natural world and people of color is commonplace (Lewis & James, 1995). Some have argued that unless EE programs address pertinent issues to the community, people of color will not find these programs beneficial, and thus not pursue a career in EE (Lewis & James, 1995). The needs of minority communities should be explicitly addressed in EE programs in order to make them relevant, and thus appreciable, by these communities. EE programs that only cover nature-based issues in rural areas may not appeal to urban audiences, which may value environmental issues concerning quality of life and environmental justice more (Lewis & James, 1995). Because the quality of EE programs depends on relevance to the enrolled students, addressing the aspects likely of interest to people of color should be at the center of building these programs, which oftentimes does not occur (Lewis & James 1995). The lack of appealing program objectives and the lack of input from BIPOC individuals may contribute to a lack of program appeal. This could easily be changed by reversing these measures to more commonly include BIPOC individuals in the conversation and development of EE.

Another misconception surrounding people of color and the environment is the belief that people of color have not been involved in the decision-making process of environmental concerns (Lewis & James, 1995) although people of color often experience the majority of environmental burdens (Warren & Patel, 2021). While the history of the environmental and conservation movement is dominated by white individuals, such as John Muir, Rachel Carson (Lewis & James, 1995), President Theodore Roosevelt, and Gifford Pinchot, the contributions of BIPOC communities underlie many environmental movements. The first park rangers at Sequoia National Park were an all-Black cavalry, also known as the "Buffalo Soldiers", led by Colonel Charles Young. He and his troops maintained and managed the park and Colonel Young became the first African-American national park Superintendent (National Park Service, 2022). Often ignored by history, these soldiers contributed significantly to the beginnings of the park system and conservation efforts. Furthermore, three days after Rachel Carson's book, *Silent Spring*, was published exposing the effects of DDT, Latino farm workers rallied to discuss the dangers of DDT pesticide use at an American Federation of Labor and Congress of Industrial Organizations (AFL-CIO)

meeting, but these rallying efforts are not recognized in the history of environmental movements (Lewis & James, 1995). Efforts by these farmworkers continued into 1989 when Cesar Chavez, President of the United Farm Workers of America, spoke on the use of pesticides and the disregard for farm workers' safety during the AFL-CIO meeting in 1989:

> *"When farm workers organize against these injustices they are met with brutality and coercion and death…With all these problems, why, then, do we dwell so on the perils of pesticides? …That is protecting farm workers and consumers from systematic poisoning through the reckless use of agricultural toxics. There is nothing we care more about than the lives and safety of our families." (United Farm Workers, 2017)*

BIPOC individuals are not less interested in environmental issues but rather they are often the demographic most burdened by environmental concerns (Anderson, 2021), as demonstrated through Chavez's address, and are, in fact, at least as concerned about environmental problems and their impact on health as white individuals (Mohai, 2003).

Furthermore, the misconception that people of color do not participate in EE must be addressed. Involvement in EE by people of color is prevalent. For example, there was a summit in 1991 known as the First National People of Color Environmental Leadership Summit which addressed EE efforts as a key topic (Lewis & James, 1995). The erasure of BIPOC individuals and their contributions to environmental history and EE efforts perpetuate the idea that they aren't involved, or simply do not belong in the environmental movement and EE. This erasure furthers biases and misconceptions surrounding BIPOC individuals and reinforces false narratives that only white individuals contribute to conservation and EE.

Section 4: Best Practices to Promote Belonging and Create More Diverse, Equitable, and Inclusive Environmental Education

Overview on Best Practices Derived from Literature

The published literature for best practices to increase diversity, equity, inclusion, and belonging in EE is variable. There is a broad base of literature addressing the best EE practices for Black and African American youth, but less concerning broader ethno-racial or socioeconomic diversity. When considering best practices for neurodivergent, disabled (see Salvator & Wolbring, 2022), and LGBTQ+ individuals, there is insufficient guidance. Many resources for these groups are outdated, and further research and analysis are needed to determine statistics of employment and involvement and best practices to increase the sense of belonging in EE programs while truly creating diverse, equitable, and inclusive curricula.

As stated previously, best practices for some communities may not be the best practices for all. The practices highlighted below are derived from the literature to be applied to many, but may not be best suited for most diverse groups. In order to make EE programs equitable and inclusive for diverse groups, five key practices (*Table 5*) are recommended:

Encouraging Flexibility and Adaptation

Knowledge and Training

Allowing for flexibility, adaptation, and adjustments as needed in an EE program promotes more equity and inclusivity for demographics that might need additional support, especially those who identify as LGBTQ+, disabled, or neurodivergent. An educator's willingness to gain knowledge from and be flexible in various situations is important to support trans and gender non-conforming youth (Bren & Prince, 2022) and to help students work through challenges associated with their identities (Whitney et al., 2021). In the United Kingdom, many educators seek out training surrounding mentorship of trans and/or gender non-conforming youth to avoid situations such as potential health concerns and pronoun misuse. While many educators are willing and able to undergo this training, their likelihood of actual participation is low due to a lack of opportunity and/or resources (Bren & Prince, 2022). Within the U.S., the narrative is different. There is a large amount of hesitancy associated with LGBTQ+ training for educators due to a lack of understanding, fear of parental and community repercussions, and personal biases (Whitney et al., 2021). Educators are encouraged to move beyond anti-bullying training and towards guidance on better understanding LGBTQ+ identities, however, this prompts discomfort that must be overcome (Whitney et al., 2021). It is recommended that educators who wish to undergo LGBTQ+ inclusive training partner with community LGBTQ+ organizations and LGBTQ+ individuals in order to gain a deeper understanding of the community to best assist their students.

Table 5. Best Practices for Equitable and Inclusive EE

The following table presents best practices for increasing a sense of belonging in diverse groups in order to make EE more equitable and inclusive.

Best Practice	**Explanation**	**Components**	
Flexibility and adaptation	Consideration of how the provision of alternatives and different learning environments can affect a program	- Educator training - Adapted activities suited for *everyone* in the program - Cooperative peer-based learning	(Bren & Prince, 2022; Carrier, 2010; Cooke et al., 1997; Dupuis & Jacobs, 2021; Loskota, 2004; McGhie-Richmond et al., 2007; Whitney et al., 2021)
Valued instruction and content	Content is presented in a way in which it will be relevant and accepted by all individuals in a program	- Explicit connections to real life - Place-based education - Consideration of different perspectives - Learning atmosphere - Course content	(Carrier, 2010; Cronin et al., 2021; Ladson-Billings, 2009; Lewis & James, 1995; Loskota, 2004; Maina-Okori et al., 2017; Ngarmsang et al., 2012; Scully, 2017; Stern et al., 2010; Stern et al., 2014; Stern et al., 2022)
Mentorship and support	Support by parents and diverse mentors	- Validation by parents - Diverse role models	(Argus, 2018; Maughan, 200; Stern et al., 2022)
Awareness and acknowledgment of barriers	Consideration of how factors and negative biases affect participation	- Acknowledgement of community biases, issues, and contributions - Resource and safety considerations - Historical undertones - Underlying biases	(Anderson, 2021; Cronin et al., 2021; Stern et al., 2022; Maina-Okori et al., 2017; Page, 2017; Barnfield & Humberstone, 2008; Lewis & James, 1995)
Evaluation	Need diverse evaluation methods and considerations of barriers of implementing proper evaluation both inside and outside a program	- Diverse evaluation methods - Considerations of factors affecting results	(Acree & Chouinard, 2020; Anderson, 2021)

Knowledgeable and well-informed educators allow students to feel more comfortable in revealing information pertaining to their health, such as the use of chest binders[1]. The associated side effects of the use of these binders, such as shortness of breath and overheating (Julian et al., 2021), may affect activity and health in outdoor spaces and thus the willingness of a student to disclose such information may help to ensure their health and safety. Furthermore, adjusting programs to allow for pronoun disclosure before activities begin to prevent misgendering individuals addresses "gender-normative consciousness," while establishing trust and increasing the sense of belonging in the group (Bren & Prince, 2022). As EE practitioners learn more about the life experiences and struggles of underrepresented and underserved groups, it is more likely that changes in program structure and practices are developed due to this increased awareness (Bren & Prince, 2022). All in all, well-informed educators on trans and gender non-conforming student topics and the flexibility of programs allow for a more inclusive space that goes beyond the basic accommodation of non-sex-separated facilities (Bren & Prince, 2022). There is little research in the area of LGBTQ+ inclusion in education and further analysis should be done in this field.

Likewise, concerning neurodivergent students, in-service training increased teachers' willingness to provide and use accommodations (Lovett et al., 2021). This professional development is necessary to change the narrative around students' need for accommodations, and consequently the perceptions of these accommodations among educators. Adaptations to lesson materials and environments are necessary in order to make education accessible to all, as detailed below, and the willingness of teachers to learn more about and understand accommodations is imperative to establishing this equity in the classroom.

Flexibility for Adaptations

While active experiences are idealized as beneficial activities, issues may arise concerning accessibility. The pre-planning period (Athman & Monroe, 2000 as cited in Loskota, 2004) is important for making activities accessible, which may include finding a suitable location for all students and evaluating disabled student feedback on sites and activities (Cooke et al., 1997). Some argue that accessibility in EE involves slowing down activities (Loskota, 2004), and while this is an important accommodation, all possible avenues for greater accessibility should be considered.

Educators should integrate accommodations, whether it be accepting technologies or providing adaptations for students in need to ensure that education is accessible to all students. Assistive technology, or "any item, piece of equipment or product system…that is used to increase, maintain, or improve the functional capabilities of children with disabilities" (Individuals with Disabilities Education Act, 2004 as cited in Ahmed, 2018), can enhance learning of all students with disabilities and create accessible educational atmospheres (Ahmed, 2018). Adaptations to the learning environment and materials should account for all accessibility barriers; such accommodations include closed captioning, large-print or braille text, preferential seating, multimodal instruction, or access to sensory tools (McGlynn and Kelly, 2019) (see *figure 1* of McGlynn and Kelley, 2019 for a full chart of possible accommodations).

Outdoor activities can cause a lot of anxiety and hesitancy among mobility-impaired students due to perceived barriers (Cooke et al., 1997). Due to this hesitancy, many of these students avoid outdoor

[1] A practice of "compressing or wrapping the chest to achieve a flatter appearance" (Julian et al., 2021)

activities, such as immersive field trips. Accessible activities should not aim to provide a "less challenging alternative to the traditional exercise" as these alternate activities embarrass students and prevent students' enjoyment of fieldwork (Cooke et al., 1997). Instead, activities should be able to be equally enjoyed and engaging to all. Section 504 of the Rehabilitation Act, which prevents discrimination in federal programs, mentions that "federally funded programs and activities may not discriminate against qualified persons with disabilities" (P.L. 93-112 as cited in Cook et al., 1997). This anti-discrimination policy should be applied to all activities as all K-12 and some specialized private schools must abide by this law (Lovett et al., 2021). An activity that is inaccessible to one student means that it is simply inaccessible. Inaccessibility in outdoor activities dissuades disabled students from pursuing careers in related fields (Cooke et al., 1997). Disabled individuals have as much to contribute to environmental careers and endeavors as anyone else does, and their contributions should not be discounted.

Cooperative Learning Methods

Educators are often hesitant to engage in outdoor activities and cooperative education opportunities with neurodivergent students, specifically those with Emotional and Behavioral Disorders (EBDs) due to unwanted behaviors (Dupuis & Jacobs, 2021). Oftentimes, educators put students with the same ability together for group work. Rather, educators should consider pairing students of various abilities together and adapt programs to implement cooperative learning and peer-assisted learning practices for everyone. These practices help build social networks, which is vital to helping students with EBDs cope with emotional and life challenges. They can also help mitigate the perceived challenges of students with EBDs and their engagement in outdoor activities (Dupuis & Jacobs, 2021). This peer-based cooperative learning strategy increases focus, reduces challenges, and increases social networks in students with EBDs (Dupuis & Jacobs, 2021), which all could contribute to success in EE programs.

Additionally, effective strategies in teaching neurodivergent students consist of establishing a detailed framework for lesson delivery. Student engagement is the highest when teachers utilize a framework that focuses on engagement and time management skills so educators are able to maximize the time in which they are able to work with students one-on-one or in groups (McGhie-Richmond et al., 2007). Overall, in order to make activities equitable for neurodivergent students, cooperative learning with other peers and the adaptation of educational frameworks should be considered.

Promoting Valued Instruction and Content

Explicit Connections

As previously established, explicit connections to the real world through one's lived experiences, home life, or culture make lessons more relevant and, therefore, effective for underrepresented demographics (Carrier, 2010; Loskota, 2004; Stern et al., 2022; Stern et al., 2010). Culturally responsive teaching is simply good pedagogy (Ladson-Billings, 2009); bridging the gap between home and school life makes course content more relevant to learners and increases cultural competency. Students can take what they've learned in the relevant cultural-educational context and apply it to their own communities (Ladson-Billings, 2009). The explicit linking of lessons to real situations in relation to their families or communities can also help neurodivergent students in developing attitudes of stewardship related to conservation actions (Ngarmsang et al, 2012). As such, linking EE program material to real-world experiences and applications can improve learning for all students (Carrier, 2010).

Place-based Learning

Similarly, centering education around a specific place or context grounds groups in their community, which is a key component of environmental literacy (Powell et al., 2019, as cited in Stern et al., 2022). This grounding creates an emotional connection between students and their local environment, which leads to the development of pro-environmental behaviors (Vaske & Kobrin, 2001). Considering that a key goal of EE is to establish patterns of behavior and attitudes toward the environment (*Table 2*), place-based education is an effective practice for all EE participants (Stern et al., 2014), including diverse groups. Concerning Indigenous peoples, place-based education is an important way to connect to the history of the land on which learners currently reside, foster relationships with Indigenous communities, and promote cross-cultural understanding (Maina-Okori et al., 2017; Scully, 2017). Place-based education in the context of Indigenous history and culture makes non-indigenous learners consider the history of the land around them. Through this greater understanding, students gain additional knowledge on how interconnected natural systems are to human life (Scully, 2017), which may foster different attitudes about local environments than students previously had.

Perspectives

EE should be viewed from historical, cultural, and diverse individual perspectives. Offering varied perspectives increases EE content validity and is a guiding principle of EE (*Table 4*). In order to increase the equitability and inclusivity of a program, educators should be able to recognize the diverse perspectives, connections, and issues their students may have or face in order to make the program as relevant as possible (Lewis & James, 1995; Stern et al., 2022). Educators must understand what environmental issues impact their students the most, whether it's air pollution or barriers to outdoor engagement. Additionally, educators should gain points of view from other industries and cultures (Lewis & James, 1995).

In regards to increasing belonging of Indigenous peoples in EE programs, educators should consider implementing a "two-world" pedagogy (Maina-Okori et al., 2017) instead of only looking at issues their target population faces through the lens of western science (Hessami et al., 2021) or environmentalism (Lewis & James, 1995). Part of the "two-world" pedagogy is the concept of Two-Eyed Seeing, where Western science and Indigenous knowledge are both recognized and used together to build knowledge (Hessami et al., 2021). Educators should promote the recognition of Indigenous peoples of the land on which the educator is teaching (Cronin et al., 2021) to teach students about "cultural and territorial specificity," which are both important for respect and accurate education as it relates to Indigenous peoples (Scully, 2017).

Valued Content

Equitable and inclusive EE programs should also strive to provide course content that appeals to diverse groups from a variety of backgrounds. EE should foster a safe atmosphere for diverse communities where everyone is comfortable in their identity and feels a sense of community and connection to the outdoors (Argus, 2018). For example, girl- and women-only outdoor programs have been seen to promote self-esteem, confidence, and self-understanding in the participants (Loeffler, 1996; Mitten, 1992; Whittington et al., 2011 in Warren, 2015), which leads to better skill-building and self-efficacy, established goals of EE. Furthermore, in order for programs to appeal to diverse groups,

educators are recommended to become knowledgeable about the contributions of underrepresented groups to environmental achievements (Cronin et al., 2021; Lewis & James, 1995). The acknowledgment of contributions to environmentalism from diverse groups mitigates the erasure of these communities from historical narratives.

Additionally, the incorporation of anti-racist teaching methods into course content allows for accessible and inclusive content, reduces barriers, and can lead to a culture of inclusivity in an educational setting which increases BIPOC retention in STEM fields (Cronin et al., 2021). Such anti-racist pedagogical practices include equity-based modifications, incorporation of "wise interventions", and reflections on past racist history (Cronin et al., 2021). Equity-based classroom modifications narrow barriers for marginalized groups. Instead of large weed-out classes, learning communities and active learning, such as fieldwork opportunities, can be implemented that build interest and skill development (Cronin et al., 2021). "Wise interventions", such as promoting growth mindsets and viewing cultures through a different lens instead of the predominant one (Azzahrawi, 2020) diminish stereotypical ideas and attitudes about underrepresented groups and should be implemented in educational settings starting at a young age (Cronin et al., 2021). Reflections on racist practices and history in the STEM field bring awareness to systematic issues faced by BIPOC individuals and other underrepresented groups (Alderman et al. 2021; Cronin et al., 2021). In order to implement these anti-racist pedagogical practices, educators should be knowledgeable on techniques and practices involved in these teachings. Educators can gain information and training in anti-racist teaching through a variety of sources such as the National Education Association (see https://www.nea.org/advocating-for-change/racial-social-justice; Álvarez, 2021), Anti-racist Teaching and Learning Collaborative (see https://antiracistteaching.org/teaching-guides), and the Center for Racial Justice in Education (see https://centerracialjustice.org/trainings/), among other organizations.

Providing Mentorship and Support

The literature suggests that beneficial mentorship positively impacts participation and retention rates in EE (Argus, 2018; Stern et al., 2022; Roche, 1979, as cited in Maughan, 2001). Diverse role models from underrepresented groups in EE programs have been shown to increase youth participation and enjoyment in the programs (Stern et al., 2022) and support participants in feeling validated and comfortable in their identity and self-expression (Argus, 2018). Likewise, role models should ideally have shared lived experiences with their mentees; however, when those individuals are not available, parents or guardians are a valuable resource in their child's engagement with course content (Ladson-Billings, 2009). Thus, the presence of parental support in participation in EE programs makes youth more likely to engage in such programs (Stern et al., 2010). Furthermore, the availability of mentors leads to success and satisfaction in the mentee's careers (Roche, 1979, as cited in Maughan, 2001). It follows that the same can be said for EE careers. Mentoring is a successful and vital component for increasing participation and enjoying EE programs and should be implemented in programs in order to increase students' sense of belonging and create a diverse, equitable, and inclusive environment for learning.

Acknowledging Barriers

To promote impactful changes, DEI statements must move beyond a "check-off box" or publicity statement (Bourgault & Corcoran, 2021). For EE programs to effectively connect with underrepresented

groups, EE practitioners must develop an awareness of the barriers students may face in participating in those programs (Anderson, 2021; Cronin et al., 2021; Stern et al., 2022; Maina-Okori et al., 2017; Page, 2017; Barnfield & Humberstone, 2008; Lewis & James, 1995).

LGBTQ+ Erasure and Inclusive Curricula

Acknowledgment of community presence is key to student success in educational settings to support LGBTQ+ and gender non-conforming youth (Page, 2017; Snapp et al., 2015; Robinson and Espelage, 2011). LGBTQ+ individuals are more likely to be subjected to bullying, suicidal ideation, and negative psychological and educational impacts in comparison to their straight-identifying peers (Robinson & Espelage, 2011). The erasure of the discussion of LGBTQ+ community issues, presence, and contributions in educational settings is invalidating and alienating to identifying students (Page, 2017; Snapp et al., 2015), which creates a low sense of school belonging in LGBTQ+ students (Robinson & Espelage, 2011), and does not mitigate bullying by peers and the false narratives surrounding the LGBTQ+ community (Snapp et al., 2015). LGBTQ+-inclusive curriculum is vital to establishing a positive school environment for identifying students. Such curriculum increases visibility and has a meaningful and positive impact on all students. Additionally, inclusion of this curriculum reportedly decreases bullying and harassment toward identifying individuals as the school becomes more aware and creates a culture of ease in discussing LGBTQ+ issues (Snapp et al., 2015). LGBTQ+-inclusive practices benefit all students by providing diverse perspectives to commonly accepted themes and "examine how identities and realities are constructed, both socially and linguistically" (Page, 2017). However, teachers are hesitant to employ this pedagogy in environments where expression may be considered unsafe, there is fear of retribution, a lack of training, queerphobic ideologies, or ignorance (Page, 2017; Snapp et al., 2015). Fear amongst educators in implementing this pedagogy only reinforces the erasure of the LGBTQ+ community and the idea that LGBTQ+ identities are problematic. Inclusive curriculum is most commonly implemented in social science and English classes, with little to no occurrence in science and math classes (Page, 2017; Snapp et al., 2015). It follows that similar practices for inclusive curricula like those implemented in English and social science classes would be effective in science and math courses, though they may not flow as seamlessly into the curricula. One way to do this is to highlight current and historical LGBTQ+ professionals in the field and their contributions to both the field and society. This way, educators are both acknowledging the LGBTQ+ community and promoting discussion on relevant topics.

Harmful Stereotypes of the Outdoors

Outdoor involvement is heavily gendered, which can negatively impact LGBTQ+, gender non-conforming individuals, women, disabled individuals, and those from lower socioeconomic classes (Bren and Prince, 2022; Maina-Okori et al., 2017; Barnfield & Humberstone, 2008). The concept of the outdoors and outdoor involvement is often associated with masculinity and heteronormativity (Bren & Prince, 2022). These ideologies perpetuate the narrative of who can participate in the outdoors, which marginalizes non-heteronormative individuals, women, and those who may not have equal access to the outdoors, such as disabled individuals and those from lower socioeconomic classes (Liefländer et al., 2013; Maina-Okori et al., 2017). As a result, these demographics are underrepresented because of the assumed norms of the "heterosexist and homophobic nature of outdoor education" that follow "heterosexual, white middle-class values" (Barnfield & Humberstone, 2008).

Resource and Disclosure Barriers

Concerning students with disabilities, barriers to participation in nature such as cost, time, staffing, safety concerns, and resource availability come into play in school environments, while physical access and safety were reported as the main barrier in accessing environmental centers (Benzon, 2010). Educators must be aware of these barriers in an effort to overcome them. Children with disabilities are equally capable of gaining environmental literacy, engaging in stewardship, and spreading environmental knowledge as any other student. Socially constructed barriers are at the heart of this issue, which results in disabled children having reduced access to engage and learn in the outdoors (Benzon, 2010). One barrier for disabled students is the opportunity to disclose information regarding their disability. Educators must give students the explicit opportunity to disclose any information regarding their disability in order to discuss accommodations before entering the classroom/program. Every disability is different, regardless of whether it has the same label (Cooke et al., 1997), so barriers to one individual may not be the same as another with the same label. Educators must be aware of the barriers highlighted by the students in order to make activities inclusive and equitable (Cooke et al., 1997).

Bias Associated Barriers

Racial and cultural identities, as well as financial (see Liefländer et al., 2013) and implicit biases, pose barriers to the involvement of BIPOC individuals in the environment and EE programs (Anderson, 2021; Cronin et al., 2021; Stern et al., 2022). One barrier concerning identity in underrepresented groups is tokenism or the process of presenting an individual from an underrepresented group just to display an air of inclusion or equality. Tokenism is a disempowering, isolating, and invalidating experience (Lewis & James, 1995; Niemann, 2016) which decreases a sense of belonging in EE and other environmental endeavors. It is a barrier that all EE practitioners should be aware of and avoid. Eurocentric and racist historical undertones to the environmental and conservation fields create an implicit barrier for BIPOC individuals from engaging in EE programs, careers, and environmental movements as a whole (Cronin et al., 2021). The current education lacks acknowledgment of the damaging history experienced by the Indigenous people, which perpetuates exclusion, marginalization, and biased perceptions of Indigenous peoples and silences their voices (Scully, 2017). Only dismantling these systemic issues through recognition of past inequities and implicit biases will enable EE to become truly equitable and inclusive

Implementing Evaluation

Diverse evaluation methodologies are needed to properly implement a diverse and inclusive EE program (Anderson, 2021). Current Eurocentric evaluation methods do not account for disparities within diverse groups, thus the evaluation results may be rendered invalid or unhelpful in program reflections and adaptations. Evaluation methods must be made relevant to the target audience through various evaluation methods such as culturally responsive evaluation, multi- and cross-cultural evaluation, participatory evaluation, and more (Anderson, 2021). An organization's mindset towards diverse evaluation matters. Adaptive management mindsets allow for flexibility and modifications based on results. Accountability perspectives and evidence-based practices may not be best fitted for evaluating diverse programs as they rely on valid results and summative assessments (Anderson, 2021).

Culturally Responsive Evaluation

A culturally responsive framework for evaluation is a collaborative approach that takes into account all factors affecting a demographic to better understand findings from evaluation results (Anderson, 2021). Culturally responsive evaluation consists of co-constructing evaluations with relevant stakeholders to better understand the limitations of biases and reflect on how knowledge and inquiry may differ based on context (Acree and Chouinard, 2020). In order for proper and valid evaluations of programs, evaluative methods must take diversity into account.

As previously mentioned (*see Section 2, Methods of Evaluation*), pre-made, standardized tools are often applied to programs. Any of these tools, when viewed through the right lens, may be a culturally responsive evaluation method if it is analyzed under the context for which it is being used (Anderson, 2021). NAAEE's eeVAL specifically is formulated around equitable and inclusive evaluation through offering a culturally responsive, equitable evaluation, and offering six core values to yield equitable and inclusive results (North American Association for Environmental Education, n.d.).

Conclusion

Environmental education (EE) is a pedagogical field that aims to engage individuals through environmental literacy. Although EE has somewhat of a controversial history, its importance is gaining recognition by classroom educators and practitioners alike. As environmental issues persist and continue to change, it is imperative that individuals are educated about the environment and gain environmental literacy in order to make knowledgeable decisions and engage in informed actions.

To properly address EE program objectives, certain practices should be followed to ensure program effectiveness. Several pre-established goals, objectives, and principles are recommended for EE and more recently, research has been conducted to further the understanding of what makes EE successful through the investigation of best practices. General best practices for EE programs should be employed along with best practices for diverse groups to ensure programs are equitable and inclusive for all.

Current EE organizations and programs are heavily underrepresented in terms of BEID, specifically concerning gender, sexual identity, ability, socioeconomic status, and ethnoracial diversity. Census projections estimate that those of multiracial and ethnoracial minority backgrounds will compose over half of the U.S. population by 2045 (Frey, 2018). If current trends in diversity hold, many EE practices will only be representative of a small portion of the population. As current environmental concerns are global issues, they need cooperation between all people to find sustainable solutions.

In order to bolster diversity in EE, a sense of belonging must be created for underrepresented groups in environmentalism and outdoor recreation. Best practices for increasing BEID for all groups should be followed. There are many gaps in the literature surrounding best practices and how to make EE programs equitable and inclusive for diverse groups, particularly for LGBTQ+ students and those with varying abilities. Further analysis and observation into effective practices of programs to gain more knowledge on these best practices may improve belonging and diversity in EE.

Works Cited

Acree, J., & Chouinard, J. A. (2020). Exploring use and influence in culturally responsive approaches to evaluation: A review of the empirical literature. *American Journal of Evaluation*, *41*(2), 201–215. https://journals.sagepub.com/doi/full/10.1177/1098214019879505

Adeola, F. O. (2004). Environmentalism and risk perception: Empirical analysis of black and white differentials and convergence. *Society & Natural Resources*, *17*(10), 911–939. https://doi.org/10.1080/08941920490505329

Ahmed, A. (2018). Perceptions of using assistive technology for students with disabilities in the classroom. *International Journal of Special Education*, *33*(1), 129–139. https://eric.ed.gov/?id=EJ1184079

Alderman, D., Narro Perez, R., Eaves, L. E., Klein, P., & Muñoz, S. (2021). Reflections on operationalizing an anti-racism pedagogy: teaching as regional storytelling. *Journal of Geography in Higher Education*, *45*(2), 186–200. https://doi.org/10.1080/03098265.2019.1661367

Álvarez, B. (2021, September 21). *Teaching with an anti-racist lens*. National Education Association. https://www.nea.org/advocating-for-change/new-from-nea/teaching-anti-racist-lens

American Psychological Association. (2021). *Inclusive language guidelines*. https://www.apa.org/about/apa/equity-diversity-inclusion/language-guidelines.pdf

Anderson, K. C. (2021). *Investigating aspects of diversity, equity, and inclusion, adaptive management, and evaluation in environmental education* [Doctoral dissertation, Virginia Polytechnic Institute and State University]. VTechWorks. https://vtechworks.lib.vt.edu/bitstream/handle/10919/103472/Anderson_KC_D_2021.pdf?sequence=1&isAllowed=y

Angel, D. M., Schatz, M., Zeiger, R. S., Sicherer, S. H., & Khan, D. A. (2021). Diversity, equity, and inclusion: What can a journal do? *The Journal of Allergy and Clinical Immunology: In Practice*, *9*(11), 3853–3856. https://doi.org/10.1016/j.jaip.2021.09.019

Anti-Racist Teaching & Learning Collective. (n.d.) *Teaching guides*. https://antiracistteaching.org/teaching-guides

Argus, S. M. (2018). LGBTQ girl scouts reflect on their outdoor experiences. In T. Gray & D. Mitten (Eds.), *The Palgrave International Handbook of Women and Outdoor Learning* (pp. 529–543). Springer International Publishing. https://doi.org/10.1007/978-3-319-53550-0_35

Athman, J. A., & Monroe, M. C. (2001). Elements of effective environmental education programs. *Defining Best Practices in Boating, Fishing, and Stewardship Education*, 37–47. http://www.rbff.org/educational/BPE3.pdf

Azzahrawi, R. (2020). Emphasizing multicultural and anti-racist pedagogies as one aspect of decolonizing education. *Canadian Journal for New Scholars in Education*, *11*(1), 36–43. https://journalhosting.ucalgary.ca/index.php/cjnse/article/view/69343

Barnfield, D., & Humberstone, B. (2008). Speaking out: perspectives of gay and lesbian practitioners in outdoor education in the UK. *Journal of Adventure Education & Outdoor Learning*, *8*(1), 31–42. https://doi.org/10.1080/14729670801976086

Barrable, A. (2019). Refocusing environmental education in the early years: A brief introduction to a pedagogy for connection. *Education Sciences*, *9*(1), 61. https://doi.org/10.3390/educsci9010061

Barry, J., (1976). UNESCO-UNEP Environmental Education Newsletter, *I*(1), 1-9. https://naaee.org/sites/default/files/153391eb.pdf

Benzon, N. (2010). Moving on from ramps? The utility of the social model of disability for facilitating experiences of nature for disabled children. *Disability & Society*, *25*(5), 617–626. https://doi.org/10.1080/09687599.2010.489313

Blatt, E. N. (2015). An investigation of the goals for an environmental science course: teacher and student perspectives. *Environmental Education Research*, *21*(5), 710–733. https://doi.org/10.1080/13504622.2014.918935

Bourgault, N., & Corcoran, W. (2021). *Developing diverse, accessible environmental education partnerships on an organic farm near ann arbor, MI*. https://doi.org/10.7302/3790

Bren, C., & Prince, H. E. (2022). The experiences of trans and non-binary participants in residential and non-residential outdoor programmes. *Journal of Outdoor and Environmental Education*, *25*(1), 27–45. https://doi.org/10.1007/s42322-021-00092-9

Carleton-Hug, A., & Hug, W. J. (2010). Challenges and opportunities for evaluating environmental education programs. *Evaluation and Program Planning*, *33*(2), 159–164. https://doi.org/10.1016/j.evalprogplan.2009.07.005

Carrier, S. J. (2009). Environmental education in the schoolyard: Learning styles and gender. *The Journal of Environmental Education*, *40*(3), 2–12. https://doi.org/10.3200/JOEE.40.3.2-12

Carter, R. L., & Simmons, B. (2010). The history and philosophy of environmental education. In Bodzin, A., Shiner Klein, B., & Weaver, S. (Eds.), *The Inclusion of Environmental Education in Science Teacher Education* (1st ed., pp. 3–16). Springer Netherlands. https://doi.org/10.1007/978-90-481-9222-9

Center for Racial Justice in Education (n.d.). *Trainings*. https://centerracialjustice.org/trainings/

Chan, J. (2017). Complexities of racial identity development for asian pacific islander desi American (APIDA) college students. *New Directions for Student Services*, *2017*(160), 11–23. https://doi.org/10.1002/ss.20240

Cincera, J., Johnson, B., & Kovacikova, S. (2015). Evaluation of a place-based environmental education program: From there to here. *Applied Environmental Education & Communication*, *14*(3), 178–186. https://doi.org/10.1080/1533015X.2015.1067580

Cooke, M. L., Anderson, K. S., & Forrest, S. E. (1997). Creating accessible introductory geology field trips. *Journal of Geoscience Education*, *45*(1), 4–9. https://doi.org/10.5408/1089-9995-45.1.4

Cousins, B. J., & Earl, L. M. (1992). The case for participatory evaluation. *Educational Evaluation and Policy Analysis*, *14*(4), 397–418. https://doi.org/10.3102/01623737014004397

Cronin, M. R., Alonzo, S. H., Adamczak, S. K., Baker, N. D., Beltran, R. S., Borker, A. L., Favilla, A. B., Gatins, R., Goetz, L. C., Hack, N., Harenčár, J. G., Howard, E. A., Kustra, M. C., Maguiña, R., Martinez-Estevez, L., Mehta, R. S., Parker, I. M., Reid, K., Roberts, M. B., … Zavaleta, E. S. (2021). Anti-racist interventions to transform ecology, evolution and conservation biology departments. *Nature Ecology & Evolution*, *5*(9), 1213–1223. https://doi.org/10.1038/s41559-021-01522-z

Cutter-Mackenzie, A., & Edwards, S. (2013). Toward a model for early childhood environmental education: Foregrounding, developing, and connecting knowledge through play-based learning. *The Journal of Environmental Education*, *44*(3), 195–213. https://doi.org/10.1080/00958964.2012.751892

Dale, R. G., Powell, R. B., Stern, M. J., & Garst, B. A. (2020). Influence of the natural setting on environmental education outcomes. *Environmental Education Research*, *26*(5), 613–631. https://doi.org/10.1080/13504622.2020.1738346

Department of Diversity Initiatives. (n.d.). *Inclusive language guide*. U of SC Aiken. https://www.usca.edu/diversity-initiatives/training-resources/guide-to-inclusive-language/inclusive-language-guide/file

Dupuis, J., & Jacobs, D. (2021). Making environmental education accessible for all students: Inclusion of students with emotional and behavioral disabilities. *Journal of Science Education for Students with Disabilities*, *24*(1), 1–18. https://doi.org/10.14448/jsesd.13.0004

Ensher, E. A., & Murphy, S. E. (1997). Effects of race, gender, perceived similarity, and contact on mentor relationships. *Journal of Vocational Behavior*, *50*(3), 460–481. https://doi.org/10.1006/jvbe.1996.1547

Frey, W. (2018, March 14). *The US will become 'minority white' in 2045, Census projects*. Brookings. https://www.brookings.edu/blog/the-avenue/2018/03/14/the-us-will-become-minority-white-in-2045-census-projects/

Garg, S., & Sangwan, S. (2021). Literature Review on Diversity and Inclusion at Workplace, 2010–2017. *Vision*, *25*(1), 12–22. https://doi.org/10.1177/0972262920959523

Green 2.0. (2018). *2018 foundation transparency report card*. https://diversegreen.org/wp-content/uploads/2020/12/2018-Foundation-Report.pdf

Green 2.0. (2019). *2019 NGO diversity data*. https://diversegreen.org/wp-content/uploads/2021/01/Green2.0_NGO02112020V2.pdf

Green 2.0. (2020). *2020 NGO and foundation transparency report card*. https://diversegreen.org/wp-content/uploads/2021/02/green-2.0-2020-transparency-report-card.pdf

Green 2.0. (2021). *2021 NGO and foundation transparency report card*. https://diversegreen.org/wp-content/uploads/2022/05/2021-ngo-foundation-transparency-report-card-05202022.pdf

Hanneman, L. (2013). *The effectiveness of experiential environmental education: O'Neill sea odyssey program case study*[Master's Thesis, San Jose State University]. https://scholarworks.sjsu.edu/etd_theses/4276

Hessami, M., Bowles, E., Popp, J., & Ford, A. (2021). Indigenizing the north american model of wildlife conservation. *FACETS*, *6*, 1285–1306. https://doi.org/10.1139/facets-2020-0088

Hungerford, H., Peyton, B. R., & Wilke, R. J. (1980). Goals for curriculum development in environmental education. *The Journal of Environmental Education*, *11*(3), 42–47.https://doi.org/10.1080/00958964.1980.9941381

Johnson, C. Y., Bowker, M. J., Bergstrom, J. C., & Cordell, K. H. (2004). Wilderness values in america: Does immigrant status or ethnicity matter? *Society and Natural Resources*, 611–628. https://doi.org/10.1080!0894 1920490466585

Julian, J. M., Salvetti, B., Held, J. I., Murray, P. M., Lara-Rojas, L., & Olson-Kennedy, J. (2021). The impact of chest binding in transgender and gender diverse youth and young adults. *Journal of Adolescent Health*, *68*(6), 1129–1134. https://doi.org/10.1016/j.jadohealth.2020.09.029

Knapp, D., & Benton, G. M. (2006). Episodic and semantic memories of a residential environmental education program. *Environmental Education Research*, *12*(2), 165–177. https://doi.org/10.1080/13504620600688906

Ladson-Billings, G. (1995). But that's just good teaching! The case for culturally relevant pedagogy. *Theory Into Practice*, *34*(3), 159–165. https://doi.org/10.1080/00405849509543675

Lee, B. E. (2008). Environmental attitudes and information sources among african american college students. *The Journal of Environmental Education*, *40*(1), 29–42. https://doi.org/10.3200/JOEE.40.1.29-42

Lewis, S., & James, K. (1995). Whose voice sets the agenda for environmental education? Misconceptions inhibiting racial and cultural diversity. *The Journal of Environmental Education*, *26*(3), 5–12. https://doi.org/10.1080/00958964.1995.9941440

Liefländer, A. K., Fröhlich, G., Bogner, F. X., & Schultz, W. (2013). Promoting connectedness with nature through environmental education. *Environmental Education Research*, *19*(3), 370–384. https://doi.org/10.1080/13504622.2012.697545

Loeffer, T. A. (1996). Leading the way: Strategies that enhance women's involvement in experiential education careers. In K. Warren (Ed.), *Women's Voices in Experiential Education* (pp. 94–103). Kendall/Hunt Publishing Co. https://eric.ed.gov/?id=ED412039

Loskota, A. M. (2004). *Environmental education to sustainability education: Effective and inclusive strategies for teaching to all elementary students* [Master's thesis, The Evergreen State College]. https://archives.evergreen.edu/masterstheses/Accession89-10MIT/Loskota-Mireault_A.pdf

Lovett, B. J., & Nelson, J. M. (2021). Systematic review: Educational accommodations for children and adolescents With attention-deficit/hyperactivity disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, *60*(4), 448–457. https://doi.org/10.1016/j.jaac.2020.07.891

Maina-Okori, N. M., Koushik, J. R., & Wilson, A. (2018). Reimagining intersectionality in environmental and sustainability education: A critical literature review. *The Journal of Environmental Education*, *49*(4), 286–296. https://doi.org/10.1080/00958964.2017.1364215

Maughan, E. O., Bounds, D. L., Morales, S. M., & Villegas, S. V. (2001). A successful educational program for minority students in natural resources. *Wildlife Society Bulletin*, *29*(3), 917–928. https://www.jstor.org/stable/3784419

Mazzocchi, F. (2020). A deeper meaning of sustainability: Insights from indigenous knowledge. *The Anthropocene Review*, *7*(1), 77–93. https://doi.org/10.1177/2053019619898888

McGhie-Richmond, D., Underwood, K., & Jordan, A. (2007). Developing effective instructional strategies for teaching in inclusive classrooms. *Exceptionality Education Canada*, *17*(1), 27–52. https://www.researchgate.net/publication/266453586_Developing_Effective_Instructional_Strategies_for_Teaching_in_Inclusive_Classrooms

McGlynn, K., & Kelly, J. (2019). Adaptations, modifications, and accommodations. *Science Scope*, *43*(3), 36–41. https://www.jstor.org/stable/26899082

Meier, D., & Sisk-Hilton, S. (2017). Nature and environmental education in early childhood. *The New Educator*, *13*(3), 191–194. https://doi.org/10.1080/1547688X.2017.1354646

Meredith, J., Cantrell, D., Conner, M., Evener, B., Hunn, D., & Spector, P. (2000). *Best practices for environmental education: Guidelines for success*. Environmental Education Council of Ohio. https://eric.ed.gov/?id=ED472040

Mitten, D. (1992). Empowering girls and women in the outdoors. *Journal of Physical Education, Recreation & Dance*, *63*(2), 56–60. https://doi.org/10.1080/07303084.1992.10604117

McLean, S. (2013). The whiteness of green: Racialization and environmental education. *The Canadian Geographer / Le Géographe Canadien*, *57*(3), 354–362. https://doi.org/10.1111/cag.12025

Mohai, P. (2003). Dispelling old myths: African american. *Environment: Science and Policy for Sustainable Development*, *45*(5), 10–26. https://doi.org/10.1080/00139150309604546

My Environmental Education Evaluation Resource Assistant. (n.d.). Welcome to MEERA. https://meera.snre.umich.edu/home

Nagel, M. (2005). Constructing apathy: How environmentalism and environmental education may be fostering "learned hopelessness" in children. *Australian Journal of Environmental Education*, *21*, 71–80. https://doi.org/10.1017/S0814062600000963

National Center on Disability and Journalism. (2021). *Disability language style guide*. https://ncdj.org/style-guide/#D

National Park Service. (2022, June 16). Brigadier General Charles Young. https://www.nps.gov/chyo/learn/historyculture/charles-young.htm

Ngarmsang, K., Thiengkamol, N., & Thiengkamol, C. (2012). Development of an environmental education and environmental management model for learning disability student. *European Journal of Social Sciences*, *32*, 120–127. https://www.mdpi.com/2071-1050/14/3/1211/htm

Niemann, Y. F. (2016). Tokenism. In *The Wiley Blackwell Encyclopedia of Gender and Sexuality Studies* (pp. 1–2). John Wiley & Sons, Ltd. https://doi.org/10.1002/9781118663219.wbegss678

NLGJA: The Association of LGBTQ Journalists. (2021, December). *Stylebook on LGBTQ terminology*. https://www.nlgja.org/stylebook/queer/

North American Association for Environmental Education. (n.d.). Equitable and inclusive evaluation and learning in environmental education. eeVAL. https://evaluation.naaee.org/about

North American Association for Environmental Education. (2019, March, 27). *eeLEARN: R&E: Evaluation with Joe Heimlich*[Video]. YouTube. https://www.youtube.com/watch?v=3xRCyYzcODk&t=126s

North American Association for Environmental Education. (2020, April 11). *More definitions* [Video]. YouTube. https://www.youtube.com/watch?v=ZipKUjPovAM

North American Association for Environmental Education. (2022, April 15). eeInspire webinar, access nature: Inclusion in the outdoors [Video]. YouTube. https://www.youtube.com/watch?v=AWWQ-bUgETI

NPR Public Editor. (2019, August 21). *A former slur is reclaimed, and listeners have mixed feelings*. National Public Radio. https://www.npr.org/sections/publiceditor/2019/08/21/752330316/a-former-slur-is-reclaimed-and-listeners-have-mixed-feelings

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. https://doi.org/10.1080/13504622.2020.1800593

Page, M. L. (2017). Teaching in the cracks: Using familiar pedagogy to advance LGBTQ-inclusive curriculum. *Journal of Adolescent & Adult Literacy*, *60*(6), 677–685. https://doi.org/10.1002/jaal.616

Palmberg, I. E., & Kuru, J. (2000). Outdoor activities as a basis for environmental responsibility. *The Journal of Environmental Education*, *31*(4), 32–36. https://doi.org/10.1080/00958960009598649

Payne, P. G. (2006). Environmental education and curriculum theory. *The Journal of Environmental Education, 37*(2), 25–35. https://doi.org/10.3200/JOEE.37.2.25-35

Pearson, S., Honeywood, S., & O'Toole, M. (2005). Not yet learning for sustainability: The challenge of environmental education in a university. *International Research in Geographical and Environmental Education, 14*(3), 173–186. https://doi.org/10.1080/10382040508668349

Pearson, A. R., Schuldt, J. P., Romero-Canyas, R., Ballew, M. T., & Larson-Konar, D. (2018). Diverse segments of the US public underestimate the environmental concerns of minority and low-income Americans. *Proceedings of the National Academy of Sciences*, *115*(49), 12429–12434. https://doi.org/10.1073/pnas.1804698115

Powell, K., & Wells, M. (2002). The effectiveness of three experiential teaching approaches on student science learning in fifth-grade public school classrooms. *The Journal of Environmental Education, 33*(2), 33–38. https://doi.org/10.1080/00958960209600806

Powell, R. B., Stern, M. J., & Ardoin, N. (2006). A sustainable evaluation framework and its application. *Applied Environmental Education & Communication, 5*(4), 231–241. https://doi.org/10.1080/15330150601059290

Powell, R. B., Stern, M. J., Frensley, B. T., & Moore, D. (2019). Identifying and developing crosscutting environmental education outcomes for adolescents in the twenty-first century (EE21). Environmental Education Research, 25(9), 1281-1299.

Quimby, J. L., Seyala, N. D., & Wolfson, J. L. (2007). Social cognitive predictors of interest in environmental science: Recommendations for environmental educators. *The Journal of Environmental Education, 38*(3), 43–52. https://doi.org/10.3200/JOEE.38.3.43-52

Ramsey, J. M. (1993). The effects of issue investigation and action training on eighth-grade students' environmental behavior. *The Journal of Environmental Education, 24*(3), 31–36. https://doi.org/10.1080/00958964.1993.9943501

Ramsey, J. M., Hungerford, H. R., & Volk, T. L. (1992). Environmental education in the k-12 curriculum: Finding a niche. *The Journal of Environmental Education, 23*(2), 35–45. https://doi.org/10.1080/00958964.1992.9942794

Rian, S. W., & Coll, K. M. (2021). Increased exposure to nature reduces elementary students' anxiety. *Ecopsychology, 13*(4), 257–264. https://doi.org/10.1089/eco.2020.0070

Robinson, J. P., & Espelage, D. L. (2011). Inequities in Educational and Psychological Outcomes Between LGBTQ and Straight Students in Middle and High School. *Educational Researcher, 40*(7), 315–330. https://doi.org/10.3102/0013189X11422112

Salvatore, C., & Wolbring, G. (2022). Coverage of disabled people in environmental-education-focused academic literature. *Sustainability, 14*(3). https://doi.org/10.3390/su14031211

Schultz, W., & Kaiser, F. G. (2012). Promoting pro-environmental behavior. In S. D. Clayton (Ed.), *The Oxford Handbook of Environmental and Conservation Psychology* (pp. 1–50). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780199733026.013.0029

Scully, A. (2017). Decolonization, reinhabitation and reconciliation: Aboriginal and place-based education. *Canadian Journal of Environmental Education, 17*(4), 148–158. https://doi.org/10.1080/00958964.2017.1364215

Sheppard, J. A. C. (1995). The black-white environmental concern gap: An examination of environmental paradigms. *The Journal of Environmental Education*, *26*(2), 24–35. https://doi.org/10.1080/00958964.1995.9941437

Simmons, B., Archie, M., Bedell, T., Braus, J., Holmes, G., Paden, M., Raze, R., Smith, A., Spence, T., Walker, G., & Weiser, B. (2004). *Environmental education materials: Guidelines for excellence*. North American Association for Environmental Education. https://naaee.org/eepro/resources/environmental-education-materials

Smith, T. W. (1992). Changing racial labels: From "colored" to "negro" to "black" to "african american." *The Public Opinion Quarterly*, *56*(4), 496–514. https://www.jstor.org/stable/2749204

Snapp, S. D., Burdge, H., Licona, A. C., Moody, R. L., & Russell, S. T. (2015). Students' perspectives on LGBTQ-inclusive curriculum. *Equity & Excellence in Education*, *48*(2), 249–265. https://doi.org/10.1080/10665684.2015.1025614

Stapleton, S. R. (2015). Environmental identity Development through social interactions, action, and recognition. *The Journal of Environmental Education*, *46*(2), 94–113. https://doi.org/10.1080/00958964.2014.1000813

Stern, M. J., Powell, R. B., & Ardoin, N. M. (2008). What difference does it make? Assessing outcomes from participation in a residential environmental education program. *The Journal of Environmental*, *39*(4), 31–43. https://doi.org/10.3200/JOEE.39.4.31-43

Stern, M. J., Powell, R. B., & Ardoin, N. M. (2010). Evaluating a constructivist and culturally responsive approach to environmental education for diverse audiences. *The Journal of Environmental Education*, *42*(2), 109–122. https://doi.org/10.1080/00958961003796849

Stern, M. J., Powell, R. B., & Frensley, B. T. (2022). Environmental education, age, race, and socioeconomic class: An exploration of differential impacts of field trips on adolescent youth in the United States. *Environmental Education Research*, *28*(2), 197–215. https://doi.org/10.1080/13504622.2021.1990865

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. https://doi.org/10.1080/13504622.2013.838749

Stokking, K., van Aert, L., Meijberg, W., & Kaskens, A. (1999). *Evaluating Environmental Education*. ICUN. https://unece.org/fileadmin/DAM/env/esd/information/Publications%20IUCN/Evaluating%20environmental.pdf

Taylor, D. E. (2007). Diversity and equity in environmental organizations: The salience of these factors to students. *The Journal of Environmental Education*, *39*(1), 19–44. https://doi.org/10.3200/JOEE.39.1.19-44

Taylor, D. E. (2015). Gender and racial diversity in environmental organizations: Uneven accomplishments and cause for concern. *Environmental Justice*, *8*(5), 165–180. https://doi.org/10.1089/env.2015.0018

Tbilisi Declaration (1977). *The Global Development Research Center*. Retrieved April 17, 2022 from https://www.gdrc.org/uem/ee/tbilisi.html

The benefits of place-based education: A report from the place-based education evaluation collaborative (p. 6). (2010). US National Park Service. https://www.nps.gov/civic/resources/peec2010_web.pdf

Thelwall, M., Devonport, T. J., Makita, M., Russell, K., & Ferguson, L. (2022). Academic LGBTQ+ terminology 1900-2021: Increasing variety, increasing inclusivity?. J*ournal of Homosexuality*, 1–25. https://doi.org/10.1080/00918369.2022.2070446

Tsevreni, I. (2021). Nature journaling as a holistic pedagogical experience with the more-than-human world. *The Journal of Environmental Education*, *52*(1), 14–24. https://doi.org/10.1080/00958964.2020.1724854

United Farm Workers. (2017, April). *Cesar Chavez's first major address after his 36-day 1988 fast over the pesticide poisoning of farm workers.* https://ufw.org/cesar-chavezs-first-major-address-36-day-1988-fast-pesticide-poisoning-farm-workers-2/

US Environmental Protection Agency. (2016, September). *Ash council memo*. https://archive.epa.gov/epa/aboutepa/ash-council-memo.html

US Environmental Protection Agency, (2021a, May). *National environmental education act*. https://www.epa.gov/education/national-environmental-education-act#s4

US Environmental Protection Agency. (2021b, July). *The origins of the EPA*. https://www.epa.gov/history/origins-epa

Vasconcelos, C. (2012). Teaching environmental education through PBL: Evaluation of a teaching Intervention program. *Research in Science Education*, *42*(2), 219–232. https://doi.org/10.1007/s11165-010-9192-3

Vallée, J. (2018). Eurocentrism in the curriculum: A barrier to indigenous student success. *Vanier Academic Voices*, *1*. https://eduq.info/xmlui/handle/11515/35609

Vaske, J. J., & Kobrin, K. C. (2001). Place attachment and environmentally responsible behavior. *The Journal of Environmental Education*, *32*(4), 16–21. https://doi.org/10.1080/0095896010959

Vince, R. (1998). Behind and beyond kolb's learning cycle. *Journal of Management Education*, *22*(3), 304–319. https://doi.org/10.1177/105256299802200304

Warren, G. S., & Patel, S. V. (2021). Urban restorative environmental justice through city climate action plans. *Natural Resources & Environment*, *36*(2), 32–36. http://login.ezproxy.lib.vt.edu/login?url=https://search.ebscohost.com/login.aspx?direct=true&db=eih&AN=154395330&scope=site

White, R. L., Eberstein, K., & Scott, D. M. (2018). Birds in the playground: Evaluating the effectiveness of an urban environmental education project in enhancing school children's awareness, knowledge and attitudes towards local wildlife. *PLOS ONE*, *13*(3). https://doi.org/10.1371/journal.pone.0193993

Whitney, E. H., Skala-Cox, J. L., Hambley, M., Wenzel, C. A., & Nilsson, J. (2021). Inviting discomfort in workshops with educators on supporting LGBTQ+ students in rural schools. *Journal of Homosexuality*, 1–22. https://doi.org/10.1080/00918369.2021.1984785

Appendix A

Table A. Guiding principles derived from the Tbilisi Declaration (Tbilisi Declaration (1977), n.d.)

The following table displays guiding principles in EE as recommended in the Tbilisi Declaration. This Declaration highlights recommended standards for EE.

Principle	**Explanation**
Holistic view	Consider how economic, social, cultural, and technological factors interact to affect the environment
Lifelong learning process	Learning should occur from a young age through adulthood and be carried out in formal and non-formal educational settings
Interdisciplinary approach	Make lessons holistic in nature and well balanced between disciplines, sources, and perspectives
Point of view	Examine issues at local, regional, state, country, and world-wide levels to gain further insight
Perspectives	Consider different perspectives while also considering current and potential environmental issues
Cooperation	Emphasize the need for cooperation among different levels of affairs (local, national, global)
Development	Explicitly acknowledgement of the environment in concern to growth and development efforts
Student involvement	Students should have a role in choosing the learning experience, make decisions, and deal with the aftermath
Place	Relate environmental sensitivity in the students' communities at a young age
Causes	Aid in student discovery in the cause and effect of environmental issues
Complexity	Acknowledge the complex nature of environmental problems and the need for equally complex solutions
Diverse environment	Vary teaching approaches, such as practical activities and hands-on learning

Appendix B

Environmental Education Employment Trends

Statistics of Employment

White, middle- and upper-class men have dominated the field of EE since the environmental movement first began in the nineteenth century (Taylor, 2015; Taylor, 2007). The modern environmental movement in the 1960s coincided with major civil rights and gender-based movements. While Rachel Carson's book concerning pesticide use, *Silent Spring*, helped promote female environmental involvement, the movement remained male-dominated (Taylor, 2015). In 1990, an op-ed published in the New York Times called out large environmental agencies and organizations for hiring so few minority populations. At the time of the letter's publication, "only 1.9% of the 745 workers in the National Audubon Society, the Sierra Club, Friends of the Earth, and the Natural Resources Defense Council were minorities" (Taylor, 2007). In response, these organizations claimed the lack of minorities in the workforce was due to the fact that minorities did not apply, were not qualified, or did not want the low wages given by the organizations, instead of racist hiring practices (Taylor, 2007).

Between 2017 and 2021, NGOs on average hired 12 full-time employees, three board members, and three senior staff who identified as People of Color (POC). The average full-time staff that identified as a POC increased from around 22% in 2018 (Green 2.0, 2018) to around 40% in 2021 (Green 2.0, 2021), (*Table A1.1*). Senior staff and board members that identify as POC have steadily increased over the past five years; however, no demographic breakdown is reported likely due to a small sample size (Green 2.0, 2021). Furthermore, when small NGOs are compared to large NGOs, the proportion of POC employed in full-time positions is higher. Large NGOs have substantially increased the number of POC employed as full-time staff from 2020-2021. That being said, although smaller NGOs have a higher proportion of employees that identify as POC, the rate of increase of POC in full-time positions increases at the same rate for both large and small NGOs (Green 2.0, 2021). It is important to note that a demographic breakdown was not available in the 2018, 2019, and 2020 reports (Green 2.0, 2018; Green 2.0, 2019, Green 2.0, 2020). In the 2021 report, breakdowns were available for the different positions (Green 2.0, 2021). This is a step in the right direction concerning recognition and validation of ethnoracial diversity in the workforce.

Furthermore, when examining the top 40 environmental foundations from 2017 to 2018, disparities in diversity are prevalent (Green 2.0, 2018). Any increase or decrease is based on average US workforce numbers–50.8% for women and 40.5% for People of Color. The data was self-reported and optional for the agencies. Aggregate data for all nonprofits and all foundations are displayed in *Table 8* and *Table 9* respectively. Red categories signify a decrease from 2017 and 2018, green categories signify an increase from between 2017 and 2018, and yellow categories signify no change.

Table B1. Comparison of NGO Diversity data for full-time and head of organization positions from 2018 and 2021

The following graph depicts trends in employment in full-time and head of organization positions for NGOs in 2018 and 2021 and the associated demographic breakdown.

Demographics		Full-Time Staff (2018)	Full-Time Staff (2021)	Heads of Organizations (2018)	Heads of Organizations (2021)
White		73%	60%	No Data	73%
POC		22%	40%	No Data	27%
	Asian	No Data	7%	No Data	10%
	Black		11%		7.5%
	Multiracial		4%		4.5%
	Hispanic		10%		3%
	Other races and ethnicities		1.2%		0%
	Races and ethnicities not disclosed		8%		2%

Table B2. Aggregate data for all nonprofits and foundations derived from Green 2.0 Foundation Diversity Data

The following graph depicts trends in employment for nonprofits and foundations in the environmental sector as compared to the 2017 US census percentages of women (50.8%) and People of Color (40.5%).

Position	**Demographic**	**All Nonprofits Trend (2017-2018)**	**All Foundations Trends (2017-2018)**
Full-time Staff	Male	Decrease (-5%)	Stable
	Female	Increase (+5%)	Increase (+1%)
	People of Color	Decrease (-5%)	Decrease (-13%)
	White	Stable	Increase (+10%)
Senior Staff	Male	Decrease (-2%)	Stable
	Female	Increase (+2%)	Stable
	People of Color	Increase (+7%)	Decrease (-29%)
	White	Decrease (-11%)	Increase (+29%)
Board Members	Male	Decrease (-3%)	Decrease (-6%)
	Female	Increase (+3%)	Increase (+5%)
	People of Color	Decrease (-1%)	Decrease (-7%)
	White	Decrease (-1%)	Decrease (-3%)

Disparities in Employment

BIPOC students and faculty in the environmental field continue to remain underrepresented largely due to financial and social barriers, implicit biases, and inadequate pay (Cronin et al., 2021). The disparities in diversity, hiring, and participation in environmental and EE organizations have long been prevalent (Anderson, 2021) and are motivated by a variety of factors such as reluctance surrounding the promotion of POC, prominence of DEI-driven objectives and goals in organizations, lack of effective mentorship, deep-rooted systemic biases, and misconceptions about BIPOC involvement in environmental fields (Cronin et al., 2021; Taylor, 2015; Lewis and James, 1995).

Reluctance to hire and promote women and BIPOC individuals affect the demographics of organizations, which in turn influences the sense of belonging in prospective employees. Recruitment is typically done through word of mouth or hiring from within environmental agencies, which replicates the preexisting workforce and causes a lack of diversification. Environmental organizations rarely recruit from minority institutions that, despite having a lot of talent and motivation at hand, are not being commissioned into the field, resulting in fewer minorities being recruited and placed into the workforce (Taylor, 2015).

Additionally, there is a reluctance to promote minorities from within organizations (Taylor, 2015). A current strategy for this practice is to "groom" talented minority employees for leadership positions. This practice is significantly more common with female employees, but only 31% of organizations promoted those from racial minorities for these leadership roles (Taylor, 2015). The practice of grooming an individual from a minority group is a form of tokenism, which should be avoided when trying to make an organization diverse and equitable.

The importance of saliency of diversity, equity, and inclusion practices of an environmental organization is an important factor for students entering the workforce, especially minorities. Graduating students make up the majority of potential new hires for EE organizations, and while the majority of all students find DEI factors somewhat influential, minority students find them extremely important in their potential workplace (Taylor, 2007). Without the proper framing and execution of DEI practices within an organization, minority populations may not apply to an organization. This pattern perpetuates the cycle of hiring only white individuals, therefore greatly decreasing the potential to diversify EE workplaces.

Mentoring is also an important factor regarding minority staff retention and success rates. Mentorship can help minority staff overcome perceived barriers in the workspace such as tokenism, stereotyping, and lack of access to networks. Those in formal mentoring programs had greater job satisfaction than those who did not participate (Ensher & Murphy, 1997). Practices that enhance mentorship initiatives help in keeping minority retention rates high and thus save the organization from new hiring costs. However, many mainstream environmental organizations do not promote mentoring, thus creating a barrier to diverse hiring (Taylor, 2015).

Systemic processes and deep-rooted institutional biases pose an extreme barrier to minority employment and retention in the EE field. The history surrounding environmentalism is troubling as many of the first practices and discoveries in the field are deeply rooted in Eurocentric, racist ideas and the oppression, suppression, and marginalization of minority individuals.Techniques used today, such as scientific nomenclature, are inherently Eurocentric at their core. Early taxonomic nomenclature classified humans by their skin tone and placed white individuals above other races. Though this is not the case today, many species' nomenclature still references those who supported eugenics or racism. This practice carries on Eurocentric and racist themes and disregards local significance and knowledge of these species (Cronin et al., 2021).

Furthermore, much of early conservation work involved traveling to countries, marginalizing local peoples,suppressing their cultures, and justifying the displacement of indigenous individuals or groups through conservation efforts. Eurocentrism tends to exclude Indigenous knowledge systems,

which leads to social marginalization, feelings of doubt regarding the validity of their cultural systems, and perpetuation of the misconception that Indigenous people do not belong in academia (Valleé, 2018).

Overall, historical influences create a field deep-rooted in negative ideologies and practices. This system influences perceptions and biases towards BIPOC individuals and discourages participation in the field. In order to prevent this barrier, an understanding of the historical influences and sources of racism in the field is required (Cronin et al., 2021).

Appendix C

Table C. Terminology often used related to diversity in the EE field

The following table displays terminology used throughout the review for clarification purposes.

Term used	**Implied meaning in context**	**References**
BEID	Belonging, equity, inclusion, and diversity	--------
Diversity	Representation or composition of various traditionally marginalized groups of individuals on the basis of race, ethnicity, culture, gender, sexual orientation, gender identity and expression, socioeconomic status, disability, and more.	American Psychological Association, 2021
Equity	The provision of fair treatment, access, opportunity, and addressing needs for creating optimal outcomes for all groups of individuals	American Psychological Association, 2021
Inclusion	The creation of environments in which all individuals feel welcomed and can bring identities, strengths, and capabilities to action	American Psychological Association, 2021
LGBTQ+	Lesbian, Gay, Bisexual, Transgender, Queer/Questioning plus additional gender and sexual minorities	Thelwall et al., 2022
APIDA	Asian Pacific Islander Desi American	Chan, 2017
BIPOC	Black, Indigenous, and People of Color	American Psychological Association, 2021
Socioeconomic status	To describe quality-of-life attributes and opportunities such as income, occupation, education, and perceptions of social status and class	American Psychological Association, 2021
Disabled	To describe functional limitations in regards to a physical, mental, developmental, or intellectual disabilities	National Center on Disability and Journalism, 2021
Neurodivergent	To describe the natural variation in neurologically-based disabilities	American Psychological Association, 2021
Adaptation	Changes in an educational environment, equipment, or assessment material	McGlynn & Kelly, 2019
Accommodation Adaptation	An interchangeable term with the term adaptation	McGlynn & Kelly, 2019