

Tracking Progress and Persistent Barriers: A National Survey of Nature-Based Early Childhood in Higher Education

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ABSTRACT

Nature-based early childhood education (NbECE) is gaining visibility in the United States as states expand outdoor learning policies, licensing guidance, and program models. However, less is known about how systematically NbECE is embedded within higher education and professional development systems responsible for preparing early childhood educators. This multiple-methods national survey study examines the current state of NbECE in educator preparation, building on a 2017 baseline survey. Survey responses from 97 higher-education faculty and professional development professionals across North America indicate growing interest in NbECE and a strong perceived professional demand. However, integration remains uneven and largely dependent on individual faculty initiative rather than institutional or credential requirements. Qualitative findings highlight structural barriers to institutionalization while emphasizing NbECE's perceived value to the field. Findings suggest that NbECE is transitioning from an elective specialization to a more essential component of early childhood educator preparation, though this shift remains uneven. Implications are discussed for teacher preparation systems, professional learning structures, and policy alignment to support equitable access to nature-based learning.

Keywords: nature-based education, early childhood education, teacher preparation, professional development

As nature-based early childhood education expands across the United States, questions remain about whether educator preparation systems are evolving quickly enough to support this growth. Nature-based early childhood education (NbECE) has gained visibility as educators, families, policymakers, and researchers attend more closely to the role of nature in children's learning, development, health, well-being, and emerging environmental stewardship (Larimore, 2016; North American Association for Environmental Education [NAAEE], 2019, 2020; Wiedel-Lubinski, 2026).

This interest is unfolding amid broader educational and environmental concerns. Early childhood educators are increasingly asked to support children in ways that respond to ecological change, children's well-being, and access to healthy outdoor environments (Ernst, 2014; Moses, 2025; Torquati et al., 2013). At the same time, nature-based and outdoor learning approaches have expanded across forest preschools, nature preschools, outdoor classrooms, green schoolyards, and mixed indoor-outdoor models (Alfonso, 2024; Larimore, 2016; NAAEE, 2020; Wiedel-

Lubinski, 2026). These developments suggest that NbECE is moving from a peripheral or niche practice to an emerging area of professional knowledge with implications for early childhood curriculum, pedagogy, assessment, licensing, and teacher preparation.

Despite this growth, NbECE remains unevenly represented in educator preparation (Born, 2022). This gap matters because educator preparation helps define what counts as legitimate essential professional practice and shapes whether children from birth through age eight have regular access to high-quality environmental learning experiences.

Access and equity are also central to the future of NbECE. Nature-rich educational experiences are shaped by program cost, geography, transportation, green space availability, licensing structures, institutional resources, and cultural assumptions about nature and childhood. Without explicit attention to these conditions, the expansion of NbECE may reproduce existing inequities rather than broaden access. Preparing educators to address these complexities requires intentional coursework, field experiences, professional development, and institutional support.

As research continues to document the benefits of children's engagement with nature and NbECE programs expand across educational contexts, it is increasingly important to understand how higher education institutions and professional development providers are preparing educators to implement nature-based approaches. Key questions remain about how NbECE is incorporated into coursework, field experiences, certificates, professional learning, and institutional priorities; how demand is perceived; and what barriers limit broader integration.

Building on a 2017 national baseline survey (Born, 2022), this study expands the breadth, the number of respondents, and the historical progression of NbECE beyond the original survey. It contributes to the literature by offering one of the few national examinations of how NbECE is currently represented across higher education and professional development systems. This study was guided by the following research questions:

1. How is nature-based early childhood education currently represented in higher education and professional development settings?
2. What forms of NbECE coursework, programming, field experiences, or professional learning opportunities are currently available?
3. How do faculty and professional development providers perceive demand for NbECE among pre-service and in-service educators?
4. What barriers, supports, and future directions do respondents identify for strengthening NbECE in educator preparation?

To address these questions, we designed a survey to examine how higher education institutions and professional development providers are currently incorporating NbECE into educator preparation and professional learning. Data were collected from June through November 2024, yielding 97 responses. The study examines current NbECE offerings, perceived demand, barriers and opportunities for integration, and future directions for strengthening educator preparation.

Context and Framing

NbECE has expanded across educational and community contexts in North America, accompanied by growing attention to children's access to nature-based learning experiences. Existing scholarship has documented the developmental benefits associated with children's engagement with nature including improved physical health and reduced stress (Wells & Evans, 2003; McCormick, 2017), social-emotional skills, such as cooperation, resilience, and confidence (O'Brien & Murray, 2007; Scott et al., 2018) as well as stronger academic performance, executive functioning, and problem solving skills (Carr et al., 2017; Ernst & Burcak, 2019; Tuen Veronica Leung et al., 2019). There has also been an increasing visibility of nature-based programs in practice (NAAEE, 2020) as well as policy

conversations (Harrington, 2019; Harrington & Yair, 2025; Brown & Robinson, 2021). However, less research has examined how institutions of higher education and professional development systems are responding to this growth. The following sections examine the expansion of NbECE across systems, persistent gaps in educator preparation, and the conceptual framing that informs the current study.

Benefits of NbECE in Teacher Preparation

Research suggests that educator preparation is an important factor influencing teachers' confidence, perceived competence, and willingness to implement outdoor and nature-based learning practices (Barrable et al, 2022). Teachers who receive preparation in nature-based pedagogy report greater self-efficacy for facilitating outdoor learning, integrating environmental education across subject areas, and managing perceived risks associated with outdoor environments (Moseley et al, 2002). Professional learning opportunities can also help educators move beyond viewing nature as an occasional enrichment activity toward recognizing it as a meaningful context for supporting children's development, inquiry, and environmental stewardship.

Beyond individual teaching practices, educator preparation may also contribute to broader systems change. As more teacher preparation programs integrate NbECE into required coursework and clinical experiences, graduates are better positioned to advocate for nature-rich learning environments, collaborate with families and communities, and expand equitable access to outdoor learning opportunities across diverse educational settings.

Growth Across Systems

In recent years, nature-based early childhood education (NbECE) has begun to shift from the periphery of early learning practice toward greater recognition and integration in the United States. A national survey from the Natural Start Alliance reported that the number of outdoor preschools in the United States has more than doubled in the past five years (North American Association for Environmental Education, 2023), and several states are revising licensing standards to include outdoor classrooms and nature-based learning (Harrington, 2025). These changes create new expectations for educator preparation.

Yet NbECE programs remain a small share of early learning options, and many young children continue to learn in mostly indoor traditional settings. Higher education, therefore, must prepare educators not only for specialized nature-based programs but also for incorporating nature and environmental education into everyday early childhood settings. If only educators who actively seek NbECE training receive it, children in under-resourced or historically marginalized communities may not have access to nature-rich learning opportunities (Wright et al., 2025). Integrating NbECE principles into early childhood teacher preparation programs offers an opportunity to align with culturally responsive pedagogies, ensuring that teaching with nature and for sustainability becomes a shared professional competence rather than a niche specialization (Bhagwanji et al., 2025; Carr, 2025).

Similar developments are occurring in Canada, where nature-based early childhood education and forest school approaches have been expanding in recent years (Harwood et al, 2020). Recent efforts have also focused on strengthening educator preparation, including frameworks for embedding outdoor and land-based pedagogies within post-secondary early childhood education programs (Lawson Foundation, 2024). These parallel developments suggest growing interest in NbECE across North America and underscore the need to understand how higher education and professional development systems prepare educators in different national and provincial policy contexts.

Constraints and Gaps in Higher Education and Teacher Preparation

Higher education institutions shape the professional knowledge and dispositions of future early childhood educators, yet teacher preparation in the United States varies widely. Two- and four-year degree programs often emphasize developmental theory, curriculum design, developmentally appropriate practice, or DAP, (NAEYC, 2022), and classroom management, with less consistent attention to environmental education or nature-based pedagogy.

In the original 2017 survey, Born (2022) found that although NbECE content was present in some higher education programs, it was often marginalized or offered as an elective rather than integrated into core preparation pathways. Many early childhood teacher education programs still emphasize indoor classroom models and conventional field placement structures, leaving pre-service and in-service educators with limited opportunities to study NbECE, observe it in practice, or develop related pedagogical skills needed to implement nature-based learning in developmentally appropriate, culturally responsive, and contextually relevant ways. Several structural constraints may contribute to these gaps, including packed teacher preparation curricula, limited faculty expertise, insufficient field placement opportunities, institutional priorities, and limited access to outdoor learning spaces.

Teacher learning also extends beyond preservice programs. Professional development, in-service training, and mentorship can provide important pathways for educators to develop NbECE knowledge and skills; however, these opportunities are often shaped by individual initiative rather than embedded within ongoing professional learning systems. For this reason, in addition to higher education faculty, survey eligibility also included professionals who contribute to teacher development beyond traditional higher education faculty roles.

Conceptual Positioning of Current Study

This study is framed by the intersection of developmentally responsive practice (DRP), environmental education, and equity-focused teaching. DRP builds on developmentally appropriate practice (DAP) by emphasizing educators' responsiveness to children's individual abilities, interests, and developmental needs (Carr et al., 2025). Nature-based education extends these principles into outdoor and environmentally immersive contexts, while culturally responsive and socially just pedagogies position NbECE as a professional competency that supports equitable access to nature-rich learning experiences. By preparing educators to engage children in meaningful interactions with nature, teacher preparation programs can support both child development and environmental stewardship.

Although interest in NbECE continues to grow, less is known about how higher education institutions prepare future educators to implement nature-based pedagogies or how faculty perceive NbECE's role within teacher education. This study builds on prior survey work (Born, 2022; NAAEE, 2023) by examining current practices, barriers, opportunities, and future directions for NbECE across higher education and professional development contexts.

Research Design

This multiple-methods study used surveys to capture both quantitative and qualitative data, thereby reducing single-method bias (Creswell & Plano Clark, 2018). The quantitative data revealed broader trends in the field; the qualitative data provided deep insights into higher education and NbECE. Together, these cumulative results tell a more complete story of current NbECE teacher preparation programs. The survey design was guided by developmentally responsive practice, environmental education, and equity-focused pedagogy, allowing quantitative findings on prevalence and integration to be interpreted alongside qualitative insights about challenges and opportunities.

The survey instrument was customized to assess the presence, integration, and perceived importance of NbECE content in teacher preparation programs. We used Google Forms, which has basic transport and access safeguards to prevent spam, to create, manage, and distribute the survey, which consisted of 18 items with skip logic to direct respondents to appropriate questions¹. The survey was structured as multiple-choice questions, collecting Likert-scale (ordinal) and categorical data. The survey included six optional open-ended response opportunities. Four short-answer questions allowed participants to elaborate on their multiple-choice responses, and two long-form open-ended questions at the end of the survey invited participants to share additional thoughts, ideas, or concerns related to NbECE in higher education and professional development.

¹ The full survey with all questions available in the skip logic format can be found in Supplementary File 1.

The survey was developed by reviewing prior research on NbECE in higher education, including a 2017 baseline survey, and was refined through consultation and pilot testing with NbECE experts within the Natural Start Alliance network to ensure clarity, relevance, and reliability. The instrument was estimated to take 15 minutes to complete, and respondents were allowed to skip items if necessary.

The study received approval from Hamline University's Institutional Review Board. The survey in the present study was open from June through November 2024 and generated 97 responses, compared with 52 responses in 2017. The survey was distributed through professional organizations and networks serving higher education, professional development, and early childhood education audiences, with chain-referral recruitment used to broaden participation.² Participants were informed of the purpose of the research, voluntary nature of participation, confidentiality protections, and the option to withdraw at any time.

Data Analysis

Survey responses to structured items (e.g., Likert-scale, categorical multiple-choice) were analyzed using Microsoft Excel. Descriptive statistics, including frequencies, percentages, and means, were calculated to summarize the presence and integration of NbECE content across teacher preparation programs. Cross-tabulations were used to explore trends across program types, institutional settings, and geographic regions.

While the survey questions guided attention to participants' experiences, perceived barriers, opportunities, and recommendations related to NbECE preparation, the qualitative analysis of open-ended survey responses followed an inductive thematic approach, deriving themes from patterns identified in the data rather than applying a predetermined coding framework. Following Miles, Huberman, and Saldaña's (2020) iterative approach, qualitative responses were analyzed through first-cycle descriptive coding and second-cycle pattern coding to identify broader categories and emergent themes. Using Microsoft Excel, we reviewed each open-ended question separately, organized responses by topic, highlighted recurring ideas with a consistent color-coding scheme, and developed themes iteratively across responses.

Quantitative and qualitative findings were integrated using a combining technique (Plano Clark & Ivankova, 2016). Quantitative data identified patterns in program presence and integration, while qualitative responses contextualized those patterns through participants' experiences, perceptions, and recommendations.

Results

Findings from the 2024 survey suggest both growth and uneven integration in the field of nature-based early childhood education (NbECE). Compared with the 2017 survey, the current survey received more responses and reflected broader participation across higher education and professional development contexts. Across responses, participants described increasing interest in NbECE, but also noted that its presence in educator preparation remains inconsistent, often dependent on individual faculty, institutional priorities, and access to resources.

Findings are presented across descriptive and thematic sections, including respondent characteristics, current offerings, perceived demand, barriers to integration, and future directions. The 2024 survey also added items

² Distribution channels included the Natural Start Alliance, NAAEE, Children & Nature Network, NAEYC teacher education and nature interest forums, selected AERA groups, regional networks, email lists, relevant websites, and social media. Initial contacts were also encouraged to share the survey with colleagues and affiliated networks. . Survey dissemination within the Natural Start Alliance network was tracked systematically using a spreadsheet that documented the date, distribution channel, and contact.

examining whether, where, and how explicit NbECE content appears in coursework, field experiences, training programs, and professional development.

Together, the results point to a field gaining visibility but not yet systematically embedded in educator preparation.

Respondents Reflect a Broad Ecosystem

Geographic Representation: As shown in Figure 1, the survey received responses from professionals across 36 U.S. states and Washington, D.C., for a total of 93 responses from the United States. Minnesota had the highest representation, contributing 10 responses (10.3%), followed by California with 7 (7.2%) and Washington with 5 (5.2%). The remaining U.S. responses were distributed relatively evenly, with states contributing between one and four responses. Three responses came from Canada and one from outside North America, while the overall sample remained primarily U.S.-based.

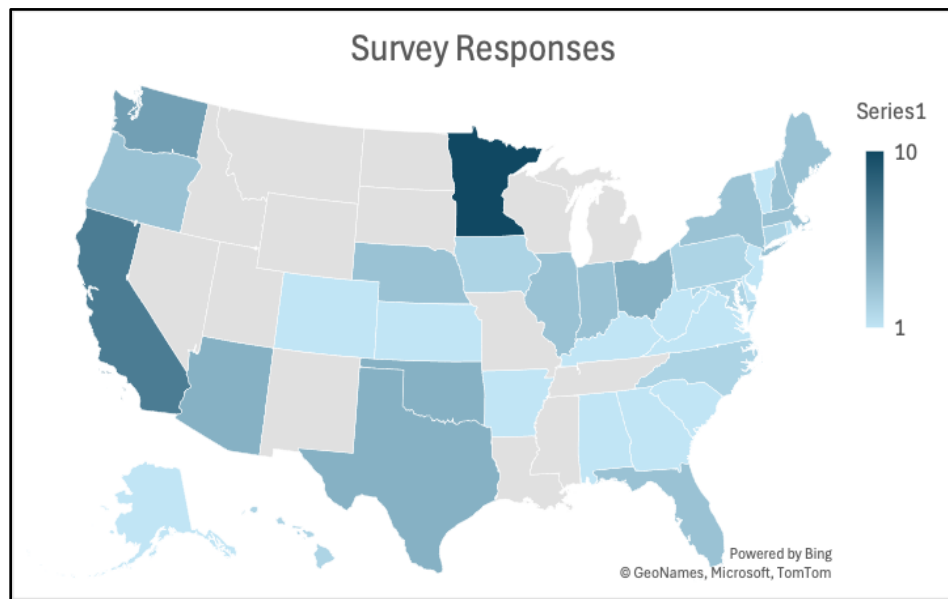


Figure 1: Geographic Representation of Survey Responses; N = 97

Institutional Descriptions: Respondents represented a broad range of institutional types. Public four-year universities and colleges remained the largest group, accounting for 33% of responses (32 of 97), but this was lower than in the 2017 survey, when they accounted for 52% of responses. This shift may reflect the larger response pool and a more diverse mix of institutions involved in NbECE preparation, including professional development providers and community colleges.

This distribution suggests that NbECE preparation is not concentrated solely within traditional four-year teacher preparation programs. Instead, responses point to a broader ecosystem of higher education, community colleges, professional development, and related early learning settings, suggesting that integration may depend as much on coordination across institutions as on changes within individual degree programs.

Professional Role: Respondents also represented a range of professional roles. Full-time faculty in early childhood education or child development formed the largest group (32 respondents, 33%), followed by adjunct or part-time faculty (21 respondents, 22%). The “other” category included 23 respondents (24%) and was broader than in the original survey, encompassing early learning and special education teachers, therapists, professional development specialists, social workers, and naturalists. New response categories in this 2024 survey also captured faculty in environmental education and higher education administrators or directors.

Table 1: Characteristics of Survey Respondents (N = 97)		
Characteristic	n	%
<i>Geographic Representation</i>		
United States	93	95.88%
Canada	3	3.09%
Other	1	1.03%
<i>Institutional Description</i>		
Public four-year universities or colleges	32	32.99%
Private 4-year college/university	13	13.40%
Two-year college/community college	17	17.53%
Professional development organization/provider	23	23.71%
Other	12	12.37%
<i>Professional Role</i>		
Full-Time Faculty in ECE / Childhood	32	32.99%
Adjunct/Part Time ECE Faculty	21	21.65%
Faculty in Environmental Ed	7	7.22%
Consultant/Coach	6	6.19%
Director (for College Program)	5	5.15%
Other Higher Ed Admin Staff	3	3.09%
Other	23	23.71%

Table 1: Characteristics of Survey Respondents

**Note: in "Professional Role" Coach/Consultant was not a listed category on the survey but was found to have a significant presence*

In the "other" category and therefore was pulled out separately for analysis.

Nature-based Early Learning Is Visible but Not Systematically Embedded

This follow-up survey added questions about the explicit integration of NbECE within higher education and professional development settings, including whether content was offered, at what level, and through which courses, programs, or professional learning opportunities. Of the 97 survey responses, 47 (48.5%) indicated they do not offer any programming with a nature-based focus.

The 39 respondents (40.2%) who reported offering NbECE content received follow-up questions about the types of programs or courses provided. A check-box grid asked whether their institutions included 10 types of offerings³ and

³ These ten options were: focus or inclusion of NbECE in mainstream course(s); Specific NbECE courses; Environmental Studies/Environmental Education courses with a focus in NbECE; NbECE DEGREE; ENDORSEMENT in NbECE; NbECE ENDORSEMENT in special education; LICENSURE in early childhood teaching with a focus on NbECE;

whether these appeared at the undergraduate or graduate level, with an “unsure” option for respondents who did not have complete knowledge of all institutional offerings.

Among the ten options provided, the most frequently selected was “Specific NbECE courses,” with 23 respondents indicating such courses were offered at the undergraduate level and six at the graduate level. The second most common option was “Focus or inclusion of NbECE in mainstream course(s),” reported by 16 respondents at the undergraduate level and seven at the graduate level. (see Figure 2).

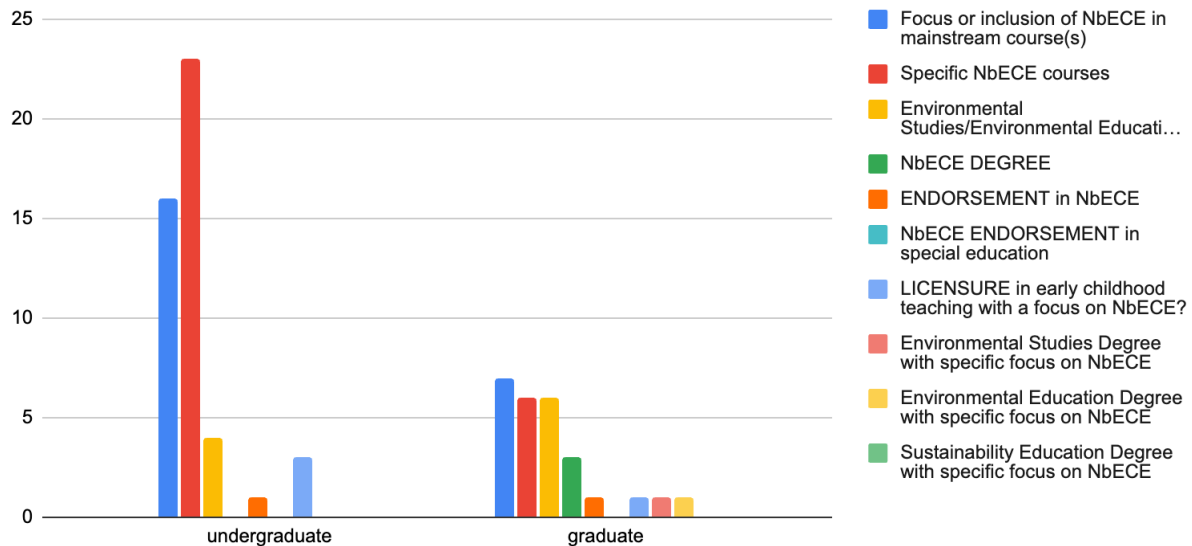


Figure 2: Responses to the Question: Which of the following does your institution offer WITH AN EXPLICIT FOCUS ON NbECE? N = 39

Thirty respondents (out of the 39 directed to this section) shared course or program examples, illustrating varied approaches to NbECE integration. Offerings ranged from introductory courses such as Nature-Based Learning in Early Childhood, Children and Nature, Introduction to NbECE, and Outdoor Learning for Young Children to content embedded in Math Methods for ECE, Science and Nature with Young Children, Leading Inclusion in Nature-Based Programs, and Planning Environments for ECE. Respondents also noted internships, field-based work, practicum experiences, and specialized topics such as risk management.

Determining the Need and Demand

Enrollment Trends: Respondents from institutions offering NbECE programming were asked to describe enrollment trends in NbECE-focused courses over the past three years. Of the 37 respondents who answered this section, enrollment patterns varied as follows:

Environmental Studies Degree with specific focus on NbECE; Environmental Education Degree with specific focus on NbECE; Sustainability Education Degree with specific focus on NbECE

Table 2: Enrollment trend reported by respondents. N = 37

Enrollment Trends			N = 37	
	n	%		
growing rapidly/always full	3	8.11%		
growing steadily	8	21.62%		
steady/typical	9	24.32%		
low enrollment	5	13.51%		
Other	12	32.43%		

Respondents who chose the “other” option offered diverse explanations, such as high student interest but low enrollment due to competing course requirements, uncertainty in the early stages of course offerings, or limited knowledge of enrollment data given their role at their institution.

Taken together, these responses suggest that interest appears strongest where programming already exists, but enrollment is shaped by curricular constraints, early-stage course development, and uneven institutional tracking. The pattern is therefore less a simple indicator of student demand than an indication that demand could be shaped by whether programs make NbECE visible, credit-bearing, and feasible within degree pathways.

Student Feedback Indicates Strong Value Within Existing Programs: Respondents also rated student feedback on NbECE-focused courses, offering another indicator of perceived value. Thirty-six of the 39 respondents who filtered to this question answered it as follows:

Table 3: Faculty rating of student feedback. Ratings were provided only by respondents whose institutions offered NbECE-focused programming and who answered this item (n = 36).

Rating of Student Feedback	n	%
1 = Little apparent value	0	0%
2	1	2.8%
3	3	8.3%
4	9	25.0%
5 = Significant value	24	66.7%

Because these ratings come only from respondents with existing NbECE offerings, they should not be read as evidence of universal student demand. Rather, they suggest that when students encounter NbECE coursework, faculty perceive it as highly valued.

Professional Demand Is Strong but Unevenly Legible: All 97 respondents were asked whether they perceived professional demand for NbECE. Most respondents (80%) answered “yes,” while 10 (10%) answered “no” and nine (9%) selected “unsure.” This pattern points to broad perceived demand, but the open-ended responses show that demand is not equally visible across regions, institutions, or policy contexts.

Respondents who perceived demand emphasized growing interest among students, practitioners, and programs, along with the broader professional value of NbECE. They also noted that training and support opportunities are not keeping pace with the expansion of nature-based programming.

“Unsure” responses pointed to regional variation, emerging interest, and difficulty measuring demand without formal data. Some also noted structural barriers, including dominant narratives about “kindergarten readiness” that prioritize traditional academic instruction over nature-based approaches.

Respondents who answered “no” cited systemic barriers to integrating NbECE into teacher preparation, including state mandates, standardized education priorities, and the limited visibility of NbECE programs.

Certification Is Seen as Useful but Potentially Unequal: Respondents were also asked about the perceived value and demand for a national NbECE credential. Sixty respondents (61%) indicated that such a certification would hold value, four (4.1%) responded negatively, and the remainder selected “maybe.” Perceived student demand was more mixed: 57.7% expected moderate demand, while high demand (20 responses, 20.6%) and low demand (21 responses, 21.6%) were nearly evenly split. The responses suggest that certification may support legitimacy and consistency, but respondents also raised concerns about whether credentialing could create additional barriers if it is not aligned with state systems, affordability, and justice-oriented commitments.

Open-ended responses about certification highlighted perceived benefits, concerns, and factors shaping interest. The following themes emerged from the qualitative data.

Legitimization and Professionalization of NbECE: The strongest theme in this open-ended question revolved around legitimization and professionalization within the field. Responses captured the sentiment that a national certification for NbECE would provide formal recognition and legitimacy to the field, elevating its status within the broader early childhood education sector. Respondents emphasized that such a credential would validate NbECE programs and practitioners, reinforcing their expertise and professionalism. One respondent (participant 17) sums it up well, “It would legitimize this kind of education. It would hopefully allow instructors a fair wage. It might help parents feel that this type of education is safe as well as good for their child” while another (participant 63) succinctly states, “The field needs national recognition in order to validate the work that is being done.”

Standardization and Consistency in Training and Practice: Respondents highlighted the need for a standardized curriculum and consistent expectations for NbECE educators. Some discussed a wide variation in how nature-based learning is implemented, leading to inconsistencies in quality, accessibility, and equitable practices. Notable benefits of consistency included comprehensive, reliable training for educators, improved instructional quality, support for equitable hiring practices, and transferable qualifications across states.

Expanding Opportunities for Educators and Programs: The open-ended responses highlighted the need to expand opportunities for educators and programs. There was discussion about how a national NbECE certification would “open doors” for educators by increasing their employability and expanding career options. As noted in participant 4’s response, a certificate would “give teachers more opportunities for employment and choice in their careers.” Other respondents echoed this, stating that a certificate would make teachers more “marketable,” and one noted the importance of national certification being transferable from state to state so that teachers have ownership and choice in employment decisions.

Enhancing Child Development and Environmental Stewardship: Support for certification was also tied to beliefs about children’s learning and environmental stewardship. Respondents emphasized that outdoor play and exploration can support cognitive, social, emotional, and physical development. A certification was perceived as potentially important for these benefits. Beyond individual child outcomes, respondents also stressed that instilling a connection to nature from an early age could have long-term effects on environmental stewardship, encouraging children to grow into adults who care for and advocate for the natural world.

Limitations of a National Certification: Four respondents of this survey answered “no,” a national certification or credential for NbECE, would not be a valuable contribution to early childhood education. The responses opposing a national certification for nature-based early childhood education (NbECE) highlight concerns around practicality and equity. Some argue that unless the certification aligns with state-specific teacher training requirements, it would have little practical value, as states may be reluctant to recognize credentials from outside their own systems. Others emphasize that the field has more pressing advocacy priorities, such as improving teacher pay, reducing class sizes, increasing resources, and fostering diversity and inclusion. Additionally, there are concerns that a certification might not adequately address justice and equity in outdoor learning, potentially reinforcing existing racial and social dynamics rather than centering anti-bias, anti-racist work.

Student demand for a national certificate: Most respondents anticipated moderate demand. While many perceived strong interest in outdoor learning, they also noted barriers such as time constraints, financial limitations, and competing academic or professional priorities.

Respondents Link Support to Infrastructure, Partnerships, and Institutional Investment

The final optional question asked higher education professionals whose programs have an NbECE focus what institutions could do to better support them and the NbECE community. Fifty-five respondents answered; three reported already feeling well supported, while the remaining 52 had a variety of suggestions including additional funding and resources, stronger integration into teacher preparation, and expanded networks for collaboration and professional development. These suggestions indicate that respondents saw support not only as a matter of individual faculty interest, but also as a need for infrastructure, institutional commitment, and partnerships.

The most common suggestion was adding more NbECE-focused courses, mentioned by 19 of the 55 respondents. Other frequent recommendations included dedicated resources such as outdoor spaces and lab schools. These responses suggest that stronger NbECE preparation depends on both curricular inclusion and the material conditions that allow educators to practice nature-rich pedagogy. These themes are summarized in Table 4 with representative quotes.

Table 4: Themes within: What can institutions do to better support NbECE professionals and community?

Theme	Number of Responses with this theme (n = 55)	Representative quotes
Courses/PD	19	<i>Allowing for specific courses to be taught that focus on nature-based knowledge/skills would be wonderful. I would also like support on how to best integrate some of this content into existing courses (participant 4)</i> <i>Be open to providing more courses (participant 76)</i> <i>Build it into all coursework the same way we do other critical knowledge such as diversity, ethics, etc. (participant 26)</i>
Resources/space	9	<i>accessible outdoor space to practice skills in (participant 51)</i> <i>Make sure that they have on-site space for outdoor learning (participant 63)</i> <i>development of on campus lab schools and other model programs (participant 32)</i>

		<i>Provide more resources (participant 7)</i>
Funding	9	<i>Fund NB projects and programs (participant 16)</i> <i>Financially support this type of programming with course fees and the ability to do travel courses and field trips (to visit nature based programs) (participant 34)</i> <i>Funding and marketing support (participant 13)</i>
Advocacy and Representation	8	<i>Hire more professors with NbECE experience (participant 34)</i> <i>Awareness campaigns for general public, for parents and for students of all the disciplines so the importance of NbECE will be recognized (participant 93)</i> <i>have a nature based research chair (participant 51)</i> <i>have a professional representing nature based early education on our advisory committee (participant 23)</i> <i>A national push (advocacy) toward NbECE (participant 8)</i>
Networking/partnerships	8	<i>More open conversations and networking with others doing this type of work (participant 85)</i> <i>Additional collaboration with state licensing requirements for outdoor nature based programs (participant 43)</i> <i>HIED institutions can develop and work in partnership with NbECE providers on matters of (a) credit for PD courses/offerings, and (b) technical assistance with assessment, research, and evaluation matters (participant 89)</i>
Research	4	<i>Research in NBEC (participant 22)</i> <i>Continue to seek answers to issues of urban equity with NbECE (participant 95)</i>

Discussion

Programmatic Growth Amid Structural Gaps

Findings from this study indicate that NbECE is experiencing continued expansion across higher education and professional development contexts in North America, reflected in increased course offerings, practitioner interest, and policy recognition. This growth aligns with national trends documenting the rapid increase in nature-based early learning programs and outdoor preschools (NAAEE, 2023), as well as state-level revisions to licensing standards that increasingly acknowledge outdoor classrooms and nature-based learning (Harrington, 2025).

At the same time, expansion has not yet led to consistent integration in early childhood teacher preparation. Nearly half of respondents reported that their institutions do not offer programming with an explicit nature-based focus in early childhood. For early childhood environmental education, this matters because prepared educators help

determine whether environmental learning becomes a regular part of birth-to-eight practice or remains an enrichment available only in some programs. This finding extends Born's (2022) earlier survey and mirrors broader critiques that environmental and sustainability education remain underemphasized in preservice teacher preparation (Alfonso et al., in press; Davis & Elliott, 2014; Ferreira et al., 2015).

Uneven Integration and Emerging Opportunities

The findings also highlight tensions characteristic of a field in transition. Standalone NbECE courses and isolated professional development offerings were the most common forms of integration, often sustained by individual faculty members or external providers. These efforts reflect meaningful innovation but also reveal the fragility of NbECE in systems without formal structures to support it.

This pattern echoes scholarship on the integration of other equity-oriented and reform-based movements in early childhood, including anti-bias education (Derman-Sparks & Edwards, 2010), culturally sustaining pedagogies (Paris & Alim, 2017), preparation for multilingual learners (Lucas & Villegas, 2013), and Universal Design for Learning practices (Chapman, 2024). Like these areas, NbECE appears to be navigating a moment of innovation and growing interest, yet lacks consistent placement in core preparation pathways.

Demand for NbECE Programming: Contextual and Relational

Most respondents perceived professional demand for NbECE (80.2%), but described it as uneven and shaped by state mandates, regional culture, institutional priorities, and dominant narratives about academic readiness. This finding complicates linear models of demand and aligns with scholarship describing teacher preparation and professional learning as relational systems influenced by policy, labor conditions, and cultural values (Cochran-Smith et al., 2016).

Although most respondents saw value in a national NbECE credential, they were less certain about student demand. Respondents identified potential benefits such as legitimacy, consistency, and professional recognition, but also raised concerns about cost, portability, and alignment with licensure requirements. These concerns mirror broader challenges across the early childhood workforce, where participation in additional credentials is often constrained by structural barriers such as cost, time, compensation, and workforce instability, rather than by a lack of professional interest (Schachner et al., 2025; Bassok et al., 2023).

Taken together, these findings suggest that expanding NbECE preparation requires more than adding courses or credentials. Equity appeared in the data primarily as a concern embedded in access, credentialing, resources, and institutional support rather than as a separately measured outcome. This finding means respondents identified conditions that could limit who benefits from NbECE preparation. As an implication, future program development should deliberately attend to affordability, transportation, field placement access, culturally responsive pedagogy, licensing alignment, and environmental justice. Without such alignment, NbECE risks remaining an optional enhancement rather than a core dimension of high-quality, equitable early childhood education.

Implications

Systematic reviews of research studies affirm that learning in nature increases children's agency, engagement, academic learning, and social skills, and that teacher preparation programs should focus on facilitating learning in natural settings (Ardoin & Bowers, 2020; Mann et al., 2022). Our research points to concrete strategies for strengthening NbECE within teacher preparation, professional learning, and policy. At the child level, these strategies are ultimately about broadening access to consistent, developmentally appropriate environmental learning experiences from birth to age 8. Yet, communicating the value of NbECE to institutional decision-makers requires linking children's positive foundational and cognitive outcomes in nature-based education programs and the ECE workforce's readiness to meet the demand for teachers trained in environmental science, learning in the outdoors, and early child development. In response, higher education must address both professional demands and educational changes that increase the pedagogical content knowledge that students will need to be effective NbECE

teachers. As early childhood educators incorporate more nature-focused pedagogies into their practices, teacher preparation programs should adapt coursework to include NbECE concepts, so educators are prepared to support children's environmental and science learning in, with, and for nature.

In higher education, nature-based approaches should be more deliberately embedded throughout core coursework so that all teacher candidates encounter these principles. Programs such as the University of Cincinnati's Nature-Based Early Learning course and Florida Atlantic University's Nature-Based Early Learning/Early Childhood Environmental Education specialization demonstrate how higher education institutions are beginning to integrate nature-rich curriculum content, field experiences, and environmental education into teacher preparation pathways (Bhagwanji et al, 2025). Nature-based field placements should be vetted and expanded, and partnerships with laboratory schools, nature reserves, and other programs implementing high-quality NbECE should be strengthened. Structured field experiences are especially important because they provide repeated opportunities for candidates to practice facilitating children's play and learning outdoors. Faculty development is also essential for implementation and should include sustained opportunities to engage with NbECE theory and research, collaborate with community partners, and model outdoor teaching practices (Carr, 2025).

The opportunity for high-quality professional learning systems that align with higher education pathways is paramount to creating a strong NbECE workforce. This type of workforce development can create a pipeline of talented educators by connecting higher education, professional learning, and ongoing support to ensure adaptability and continuing education, rather than short-term or one-shot professional development offerings. Such systems support ongoing knowledge and skill development, which is crucial for both educator retention and high-quality programming for young children.

Finally, the policy and advocacy implications of NbECE identified in this study clearly call for coordination among NbECE experts, higher education institutions, and licensing specialists. As more states revise licensing standards to include outdoor or nature-based education, integrating NbECE competencies into credentialing frameworks could help ensure more consistent professional standards while preserving the approach's essential tenets. Policymakers must understand the mission and complexity of NbECE so that arbitrary rules or policies do not inhibit equitable access, the spontaneity and relational nature of outdoor learning, child agency, or the role of nature as a co-teacher. Equitable policy frameworks could also include field-placement stipends, community-partnership infrastructure, and incentives for higher-education programs to broaden access and accommodate diverse candidate needs. Together, these efforts can strengthen the quality, coherence, and sustainability of NbECE within the broader early childhood professional ecosystem.

Limitations and Future Directions

Although the survey included respondents from Canada, the findings should be interpreted primarily within the U.S. context. The survey was developed based on the landscape of higher education and professional development opportunities in the United States and was primarily disseminated through U.S.-based networks. While the inclusion of Canadian respondents provides insight into broader North American interest in NbECE, the small number of Canadian participants does not allow for comparisons across national contexts. Future research should examine how educator preparation for NbECE varies across different policy, cultural, and educational contexts, including Canada.

Additionally, the survey captured perspectives from higher education faculty and professional development professionals; the sample may not fully represent all teacher preparation programs or regional variations in NbECE integration. Programs that are less visible, under-resourced, or recently established may be underrepresented, potentially biasing findings toward programs already engaged with nature-based approaches. We must also acknowledge that the data were self-reported, reflecting participants' perceptions of value, relevance, and structural challenges; these perceptions may differ from actual institutional practices or student experiences. While the study identifies structural barriers such as gaps in coursework, limited field placements, and funding constraints, it does not measure the long-term impacts of NbECE integration on teacher preparedness or children's learning outcomes. Finally, as NbECE continues to evolve rapidly, programmatic practices, policy contexts, and professional development offerings may change, limiting the generalizability of these findings to future conditions.

These limitations suggest several directions for future research. Longitudinal studies are needed to examine how integrating NbECE into teacher preparation and professional development affects both educator practice and child outcomes over time. Comparative research across regions and program types could illuminate structural and contextual factors that support or hinder successful implementation. Additionally, qualitative investigations of student and teacher experiences in nature-based programs would provide richer insights into how NbECE pedagogy translates into practice. Finally, research focused on equity and access is critical to ensure that all teacher candidates, regardless of institutional or community context, have opportunities to engage in high-quality nature-based learning experiences.

Conclusion

Nature-based early childhood education is at a pivotal moment in the United States, with growing interest from educators, rising policy recognition, and increasing evidence of its value for developmentally appropriate, culturally responsive, and sustainability-focused teaching. This study highlights both the promise and the persistent challenges of integrating NbECE into teacher preparation and professional development. Findings indicate that while NbECE is increasingly visible across higher education and professional development contexts, its integration remains uneven and often depends on individual faculty, institutional support, and available resources. Addressing these challenges requires coordinated action across preparation, professional learning, and policy to better equip educators to foster children's holistic development, environmental literacy, and meaningful connection to the natural world.

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Teacher education and NbECE

A team of researchers is partnering with [redacted] to understand how we prepare educators to work in nature-based early childhood education, particularly through higher education.

This survey was originally distributed [redacted]. We are repeating this survey to add to our body of knowledge, understand change in the field, and publish a national report on the state of nature-based early childhood education (NbECE) teacher preparation in higher education. We also hope to identify potential areas for advocacy and growth.

For purposes of this survey, we are interested in programs or courses which fit broadly into our understanding of nature-based early childhood education and may include the following terms: "early childhood environmental education," "early childhood education for sustainability," "place-based early childhood education," "early childhood special education," "early childhood education." Again, we are interested in programs that specifically address the role of nature in early learning.

If you have specific questions about this survey, please contact [redacted]

Alternatively, you may contact [redacted]

Important-informed consent

This survey will take approximately 15 minutes to complete and participation is completely voluntary. The survey is structured as multiple-choice questions with optional open-ended short answers. If you feel the multiple choice and short form answers do not adequately address your needs, the survey concludes with optional long-form open-ended questions which allows you to share additional thoughts, ideas, or concerns.

You may skip any open-ended question in which you would not like to participate, by clicking "next."

You may stop at any time, without penalty or harm. There is no risk to you for participating. The benefit to you is knowing that you are contributing to a better shared understanding of the opportunities and challenges associated with teacher preparation and nature-based early childhood education.

The information you provide will not be sold, shared, or used except for the purposes of this survey explained above. Your contact information will not be collected. You will have the option to provide your email upon completion of the survey. If you choose to share it, it will be used only for the purposes described herein.

If you agree, continue to the next section. Continuing to the next section indicates your consent to participate.

Demographics

1. Which of the following best describes your institution? *

Check all that apply.

- ☐ Public 4-year University/College
- ☐ Private 4-year University/College
- ☐ Community College/2-year Program
- ☐ Vocational or Technical School
- ☐ Professional Development Provider that works with licensing or department of education
- ☐ Independent Professional Development Provider
- ☐ Other: _____

2. In which state is your institution located? *

3. Optional-please provide the name of your institution

4. Which of the following role(s) best describes your primary role at the above institution. *

Check all that apply.

- ☐ Full-time Faculty in Early Childhood or Elementary Education
- ☐ Full-time Faculty in Environmental Education
- ☐ Adjunct or Permanent Part-Time Faculty
- ☐ Visiting Faculty
- ☐ Program Director/Chair/Coordinator for College Program
- ☐ Laboratory/Demonstration School Director
- ☐ Other Administrative Staff
- ☐ Other: _____

5. Does your institution offer ANY programming WITH AN EXPLICIT FOCUS ON NbECE? *

(this can include course content, specific NbECE courses, degrees, programs, endorsements, licensure, etc).

Mark only one oval.

- ☐ Yes — Skip to question 6
- ☐ No — Skip to question 11
- ☐ Unsure — Skip to question 10

Yes - EXPLICIT FOCUS ON NbECE

6. Which of the following WITH AN EXPLICIT FOCUS ON NbECE does your institution offer? Check all that apply:

Check all that apply.

Program/course	yes - undergraduate	yes - graduate	no / unsure
Focus or inclusion of NbECE in mainstream course(s)	☐	☐	☐

Specific NbECE courses	☐	☐	☐
Environmental Studies/Environmental Education courses with a focus in NbECE	☐	☐	☐
NbECE DEGREE	☐	☐	☐
ENDORSEMENT in NbECE	☐	☐	☐
NbECE ENDORSEMENT in special education	☐	☐	☐
LICENSURE in early childhood teaching with a focus on NbECE?	☐	☐	☐
Environmental Studies Degree with specific focus on NbECE	☐	☐	☐
Environmental Education Degree with specific focus on NbECE	☐	☐	☐
Sustainability Education Degree with specific focus on NbECE	☐	☐	☐

7. Optional- Please list course which focus on NbECE or include a connection to NbECE?

8. How would you describe enrollment in NbECE-focused courses over the past 3 years?

Mark only one oval.

- ☐ Some interest, but low enrollment
- ☐ enrollment is steady or so-so; about typical
- ☐ enrollment is growing steadily
- ☐ enrollment growing rapidly, we can hardly keep up
- ☐ Other: _____

9. How would you rate students' formal and informal feedback on the value of specific NbECE content over the past 3 years?

Mark only one oval.

1	2	3	4	5
Little apparent value				Students find courses very valuable

Unsure

10. You answered "unsure" to NbECE programming at your institution. Please explain.

Determining the need

11. In your personal opinion, is there professional demand for intentionally designed NbECE training and coursework in higher education/teacher preparation settings? *

Mark only one oval.

☐ Yes — Skip to question 12

☐ No — Skip to question 13

☐ Other: _____

Yes, there is a professional demand

12. You answered "yes" to a professional demand for intentionally designed NbECE training and coursework.

Optional- What is the professional demand of such a concentration and do you believe it adds value to teacher preparation programs. If so, how?

No, there is not a professional demand

13. Optional - Why is there NOT professional demand for intentionally designed NbECE training and coursework in higher education/teacher preparation settings?

"other" professional demand

14. You listed "other" to a professional demand for intentionally designed NbECE training and coursework.

Optional - please explain.

Certification and Accreditation for the field

15. If there were a national certification or credential for NbECE, would that be a valuable contribution to the early childhood education field? *

Mark only one oval.

☐ Yes — Skip to question 16

☐ No — Skip to question 17

☐ Maybe — Skip to question 18

Certification valuable

16. Why would a national certification or credential for NbECE be valuable to the early childhood field

Certification NOT valuable

17. Why would a national certification or credential for NbECE NOT be valuable to the early childhood field

Certification may be valuable

18. Why would a national certification or credential for NbECE possibly be valuable to the early childhood field

Certification and Accreditation for the students

19. If a national certification or credential for NbECE existed, do you think the demand among students would be...? *

Mark only one oval.

- ☐ low — Skip to question 20
- ☐ moderate — Skip to question 21
- ☐ high — Skip to question 21

NOT appeal to students

20. Why might an NbECE credential NOT appeal to students?

Appeal to students

21. Why might an NbECE credential appeal to students?

Final Thoughts

22. If you are a higher-ed professional with an NbECE focus, what can the higher-education institutions do to better support you and the NbECE community?

23. Please share any additional thoughts, ideas, concerns about the future of NbECE teacher preparation in higher education:

Optional Contact Info:

Your support, feedback, and insight are invaluable to us. Below, you have the option to share your contact information for possible further inquiry. Including contact information is completely voluntary. It will only be used for survey-related communication purposes.

If you choose not to share contact info, leave blank and scroll down to "submit"

24. Name:

25. email:

26. phone number:

27. How may we contact you if we have follow-up questions, or are interested in your further thoughts?

Check all that apply.

☐ Email

☐ Phone

THANK YOU for your participation and time!
We appreciate your commitment to this work!