Mentor and Mentee Benefits in Environmental Education

PRESENTED TO
Presque Isle Audubon

PRESENTED BY
Jacob Stush
Brittany Schaller

MAY 2024
Mentor and Mentee Benefits in Environmental Education

Introduction

Background Information & Need

Citizen science subjects such as birding are heading for an “extinction of experience” (Reihana, 2021) as the older generation of citizen scientists have fewer participants to pass on their knowledge to; akin to the extinction of traditional ecologic knowledge (TEKs). Mainstream Environmental Education (EE) topics yield few opportunities for establishing mentorship programs. The long-term effects of EE and citizen science mentorship programs provide little research and few papers to review. This paper, a systemic review, will collect relevant research to provide practical, evidence-based recommendations to solve problems for practitioners in the field to implement (Sutherland, 2004). In this case, compiled research will show differing levels of positive results of EE mentorship programs affecting K-12 students’ long-term knowledge, respect, ecological mindfulness, and environmental action within one to three months following EE-based mentorship programs. This review will use the meta-ethnographic method of research for interpreting similarities and differences between studies to form a narrative interpretation of the data with the intent of solving the ‘extinction of experience” as related to citizen science (Macura, 2019).
Mentor and Mentee Benefits in Environmental Education

Community Partner

Audubon chapters across the country experience recruitment issues as current members age out of the hobby with the rising generation showing little interest. Citizen scientists in botany, etymology, and herpetology all face similar issues. Though technology presents distractions to young learners, it can also make learning easier. Without succeeding generations to learn from and take the reins from the older generation, the essential grassroots data collection performed by citizen scientists on apps like eBird put data collection at risk, making conservation decisions during an era of profound climate change and biodiversity loss more difficult which threatens evidence driven conservation choices (Clements, 2021).

The Presque Isle Audubon chapter participates in outreach programs through in-school field trips, Migratory Bird Festivals, Bird Walks, endowments, grants, scholarships, and Christmas Birds counts which serve as opportunities to attract future generations. “The interest is there when we work with kids making bird feeders in schools,” said one Presque Isle Audubon Board member. But getting the deeper messages to stay long enough for a child to commit to long-term action is a challenge. Individuals may find themselves participating in birding, a memory-based hobby, due to the inspiration of a close relative or family friend (mentor). Visual learners may already hold interest in these fields but lack mentors to help navigate these interests to potentially forge a career path forward in the sciences. Mentors play a pivotal role in gaining future members in Audubon chapters and other citizen science institutions.

The research presented in this paper will assist Presque Isle Audubon, citizen science organizations, and classroom educators to recognize the beneficial value of mentorship opportunities for mentees, mentors, and citizen science subjects. This paper will guide mentorship program designers to program elements that result in the highest number of mentees committing to long-term action.
## Methods

### Databases Searched

GREENfile, ERIC, academic main, academic ultimate, environment complete, education source

<table>
<thead>
<tr>
<th>STEP</th>
<th>SOURCES</th>
<th>DATABASES &amp; KEYWORDS</th>
<th>ELIMINATION PROTOCOL</th>
</tr>
</thead>
</table>
| Initial Search | 166 Sources | Keywords: environmental education OR outdoor education OR conservation education AND mentor AND outcomes OR effects OR results Unrestricted Date / Location Ranges | • Reviewed abstracts  
• Eliminating results that were  
  ○ outdoor adventure focused, lacking environmental education, outside the age-range of K-12, articles strictly conservation science-based. |
| Abstrac t Skim | 46 Sources | • remaining sources cut to 22                                                         | • Removed additional outdoor adventure programs, professional development programs for seasoned teachers, and university mentorship programs. |
| In-Depth Review | 22 Sources | • remaining sources cut to 11 based on quality.                                       | • 4-5 sources advertised a school or nature center’s mentorship program for public consumption.  
• Articles mentioned positive effects of mentorship programs, the effects were anecdotal with no relevant data to compliment.  
• “Here Come Nature Buddies” (Glanville, 1999) periodical described a peer-to-peer mentorship program with 1st & 4th graders, kept due to commonalities in mentorship best practices. |
| Final          | 11 Sources | • final number of relevant EE Mentorship Programs for K-12                           | • Education for strategic environmental behavior (Chawla and Cushing, 2007.) added - found in multiple sources (Johnson & Pinn, 2014. Ferderbar, 2013)  
• Further sources located in bibliographies could not be acquired due to limitation of accessibility.  
• Full Circle: Native Educational Approaches Show the Way (Hall, 1996) was not included in the final source list, but kept from prescreen due to its continuity to other sources, historic and anthropological salute to mentorship part of Traditional Ecologic Knowledge (TEK) |

Eleven sources were compiled & filed into a data extraction spreadsheet using the following criteria: year, commonalities, type of mentorship, age range, location. This process facilitated in recognizing similarities between the elements in each mentorship program and allowed use of a meta-ethnographic method to build a narrative of what worked and what did not when identifying what the approaches had in common.
Results

Results show a connection between EE mentorship programs and the benefits of mentees in multiple environmental attitudes. See Figure 1, 2, and 3 for the breakdown of beneficial demographic information and categories of assessment. Cultural and community background elements are often found to be the root cause of EE mentorship program success and potential drawbacks. Below lists deviations from expected results.

- Some females in the US associate outdoors with insecure urban areas near their homes.
- Urban females may have a “naïve favorable impression of the outdoors" that wanes when the reality of physically demanding tasks, insects, or weather come into play.
- Self-efficacy and connectivity to nature in Ugandan youth females from traditional rural areas decrease after the program. This stems from learned wariness of the outdoors they live in and perform daily tasks in similar settings.
- Political awareness and civic action remain unchanged due to governmental unrest and environmental protests that turned violent.
- Traditional authoritarian or transmissive parenting providing more demands than encouragements found students scoring lower on self-efficacy, connectivity, political awareness, and civic action elements.
- Mentees had greater relationships with family and community groups than they did with the mentors they spent fewer days with.

Negative results in these studies can be attributed to extenuating circumstances beyond the scope and control of the mentoring programs. Exculpatory instances like these should be accounted for as much as possible in planning mentorship programs. All other categories turned up positive results.
It is known that EE mentorship programs benefit K-12 youth, but under which circumstances are the greatest and longest-lasting results possible? Which is most beneficial; family, professional, volunteer, or peer mentors? How do results differ between male or female, urban or rural, young or old? Though studies have similarities, variations of audience (cultures, age ranges, etc.) and program (quality, intensity, time) make it challenging to identify a one-size-fits-all approach to successful mentoring. Similar elements of mentorship programs yield beneficial results are detailed in this paper.

**Categories of Assessment**

- **Environmental Action**
- **Positive Self Image**
- **Positive Values**
- **Social Competence**
- **Self-esteem**
- **Confidence (in acquired skills)**
- **Commitment to Learning**
- **Positive Use of Time**
- **Support**
- **Self-efficacy**
- **Civic Attitudes**

- **Confidence outdoors**
- **Interpersonal Problem Solving**
- **Environmental Awareness**
- **Leadership Skills**
- **Social Justice**
- **Diversity Attitudes**
- **Empowerment**
- **Boundaries**
- **Civic Action**

**Categories that decreased or remained the same after a study due to outside community or cultural pressures**
Elements of Successful Mentorship Programs

Underlying elements of beneficial mentorship will be detailed in nine points. No program utilized all nine components. Since all programs reported positive results to mentorship, we infer that using the greatest number of strategies will maximize the program’s results.

### Relevant Cultural Background

This element may be the most pigeon-holed for a standard EE organization or school to achieve given the level of diversity in the globalized world. Only two sources (Johnson-Pynn, 2014. and Reihana, 2021) utilize cultural background and Traditional Ecological Knowledge, through their programs and studies. This strategy aids mentoring programs because it supports basic human need and relates to a deeper element of community.
Mentor and Mentee Benefits in Environmental Education

**Rotating Peer-to-Peer Involvement:** Coupled with other strategies discussed, peer-to-peer mentor relationships become dynamic. Studies actively mention or allude to elements of constructive nature, planning, and mutual benefit, which prove peer-to-peer mentorship versatility. Giving former mentees the opportunity to constructively learn the process of being a positive role model and mentor, adds a communal, scaffolded structure to these mentorship programs that echo the education structure of indigenous people where peers mentor children, adults mentor peers, and elders mentor adults.

**Planning:** Planning takes many forms in these studies. Peer-to-peer mentorships must have experienced adults mentoring peers or less experienced mentors in each program (Hacket, 2021). EE programs that are outdoor adventure based have mentees plan out jobs during camping trips (Norton, 2014; Johnson-Pynn, 2014). Consideration must be taken regarding lesson planning, as well as transmissive vs constructive methods so mentors engage mentees and mentees in turn, engage themselves.

**Outdoors:** EE concepts can be taught within a classroom, but most studies included basic outdoor components. The only program to not include an outdoor element was also the single study to report positive results on quantitative, standardized tests, (Godfrey, 2022) suggesting that the goals of the program varied slightly from the other studies.
Re-occurring Events: Mentors are more effective when a relationship is established between mentor and mentee. The basic way students of any age prepare and study for exams comes from repeated exposure to the content. Consistent, trusting relationship building with mentors highlights the purpose of mentoring—a secure, social outlet that facilitates learning and long-term devotion.

Mutual Benefit: Sources contend that mentorship programs have many benefits, for mentees and all parties involved. Mentoring a student to make or maintain bird boxes for a nature center is a symbiotic relationship in which everyone benefits. Peer-to-peer mentorships increase confidence and self-worth (Bireher, 2017). Parent mentors benefit from new ways to connect and experience nature with their children (Ferderbar, 2013). Mutually beneficial programs have a scaffolded mentorship style since peer mentors were guided and mentored by experienced teachers.

Constructive vs Transmissive Mentorship: Trade job apprenticeships model transmissive mentorship where the mentee replicates the mentors' actions until they become independently proficient. Constructive mentorship in EE yields greater positive results. Mentees set goals, are creative, and brainstorm to solve problems. The mentor plans, guides, and encourages them. Mentors ask, “How can I engage mentees, so they engage themselves?” This method achieves greater results and heightens the EE experience (Chawla and Cushing, 2007 and Hall, 1996).
Community: Community constituted larger group dynamics (mentors with more than one mentee), mentor scaffolding, instances of mentees staying connected with their mentors; or in activities around the city or town. Stronger bonds were formed with parent mentors, but also with non-familial mentors (Norton, 2014). Mentees in community projects, problem-solving, and real-life experiences such as local governmental meetings will engage further and imprint basic behaviors through transmissive mentoring (Chawla and Cushing, 2007).

Hands on activities: All studies brought an activity to engage their mentees. We consider ‘hands-on’ to be going outside, observing a tree, watching models of watersheds in the classroom, or learning camping and survival skills.
The research presented in this review concludes that mentorship programs in EE result in positive change even 90 days after the program's conclusion. Factors of success depend on elements utilized within each program. Community and cultural background prove to be the strongest influences on mentee psyche and can push them towards or away from EE related goals. The education system would benefit from mentorship opportunities for their community, symbiotic, and hands-on elements. This traditional approach is in line with how children and adults were educated long before the spread of modern educational practices (Hall, 1996). All programs in this study report positive results to mentorship. In theory, using the greatest number of strategies will maximize program results. The more elements used, the more effective the program.
References


