

**ENVIRONMENTAL EDUCATION IN OHIO  
PRESERVICE TEACHER EDUCATION:  
A RESEARCH REPORT**

A Project of EEOhio, The Center for Environmental Education in Ohio

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## EXECUTIVE SUMMARY

### BACKGROUND

According to the resource guide *Best Practices for Environmental Education: Guidelines for Success*, preservice professional development includes formal education, training, or other learning activities individuals engage in as they prepare to enter a chosen profession. For formal K-12 educators, preservice professional development typically consists of a degree and licensure program pursued through a teacher education program at an institution of higher education. For environmental educators working in nonformal educational settings preservice professional development may take place through a variety of avenues, such as other academic departments in colleges and universities and on-the-job training.

Both the quality and quantity of preservice professional development in environmental education (EE) has a great impact on the quality and quantity of EE offered to potential and actual learners. The **purpose of this study** was to assess the amount and content of environmental education in preservice teacher education programs in the state of Ohio to provide a baseline for future action and assessments. Recognizing that much preservice education of practicing environmental educators occurs in academic departments and programs other than teacher education programs, **another objective of the study** was to investigate EE related offerings in these non-teacher education departments and programs across the state.

### METHODS

The state of Ohio currently certifies teachers at three licensure levels: early childhood (grades preK – 3), middle childhood (grades 4-9), and adolescent/young adult (grades 7-12). To assess the amount and content of EE in preservice teacher education, **a survey instrument was mailed** in February, 2001, to all 51 institutions of higher education in the state of Ohio with preservice teacher education programs. The instrument was developed by a work group appointed by the Steering Committee of Ohio EE 2000 (now EEOhio), and the Ohio EE 2000 Project Director facilitated and gave oversight to the work group.

In order to investigate EE related offerings in academic departments other than teacher education programs in Ohio's higher education institutions, **an informal e-mail survey was conducted** from May to October of 2001. The survey consisted of open-ended items asking respondents to describe the nature and scope of their and their departments' involvement with EE or EE related activities.

## RESULTS

A total of 38 institutions responded to the survey mailed to the 51 Ohio institutions with preservice teacher education programs, for a response rate of 74%. Results from the study suggest that, on the whole, **environmental education is not well institutionalized in Ohio preservice teacher education programs**. Responses indicate that teacher education faculty may view EE as being within the realm of science departments, particularly biology. Only three institutions responding to the teacher education survey offer a major or minor in environmental education, and only six provide opportunities to receive “for credit” practicums, internships, or field experiences in EE. Less than half of responding institutions report that their students are exposed to any of the content areas recommended in NAAEE’s *Guidelines for the Initial Preparation of Environmental Educators*. Overall, calculations based on the data collected indicate that no more than 39% of all teacher education students in responding institutions are exposed to EE in any way.

Survey respondents are not, however, unaware of their “shortcomings” in the area of EE. As a whole, **respondents rated their teacher education programs somewhere between “poor” and “fair” in environmental education overall**, with about half of the respondents rating themselves “poor” or “not at all” effective. The data suggest that teacher education programs find little to support the inclusion of EE in their programs, with two major barriers being 1) a lack of time to incorporate EE into an already tight program, and 2) because it is not a state requirement or licensure category.

The data also suggest **a disparity among the three licensure levels** for how well students are being exposed to environmental education during their preservice education. It seems that exposure is generally best at the middle childhood licensure level, and worst at the early childhood level.

Another trend emerging from the data is that faculty interest and knowledge in environmental education may play an important role in supporting the inclusion of environmental education in preservice teacher education programs. Unfortunately **faculty expertise in EE in Ohio’s preservice teacher education programs appears to be lacking**. Almost 45% of respondents to this survey reported that they had never heard of NAAEE’s *Guidelines for the Initial Preparation of Environmental Educators*. Only 2% of the full time faculty at responding institutions specialize in environmental education.

The sample size for the informal e-mail survey of non-teacher education departments consisted of 36 individuals from fourteen different institutions. Seventeen individuals representing 11 institutions responded, for an individual response rate of 47% and an institutional response rate of 78%. Results indicate that **non-teacher education departments may play an important role in the preservice professional development of environmental educators**. Over half of the respondents reported that their departments or programs teach courses for preservice educators, both preservice

classroom teachers and those who intend to teach in nonformal educational settings. Most of these courses seem to be in the science disciplines, and few of them appear to offer courses that focus on EE as a discipline. A few (four) do offer a major, minor, or concentration in EE.

## **RECOMMENDATIONS**

- 1) One of the strongest barriers to the inclusion of environmental education in preservice teacher education in Ohio is that it is not a state certification or licensure area. If environmental education is to become institutionalized in Ohio's preservice teacher education programs, the EE community should consider the establishment of a state certification or licensure category for environmental education. Such a measure would be consistent with the *Ohio EE 2000 Strategic Plan*, which calls for development of "guidelines leading to an environmental education endorsement for all PreK-12 teachers" (EECO *et al.*, 1999, p. 17).
- 2) Given the apparent importance of faculty interest and knowledge in EE as a support to its inclusion in preservice education, the EE community should work to increase the level of interest and knowledge among teacher education and other faculty about EE in Ohio. Special efforts to promote NAAEE's *Guidelines* documents and Ohio's *Best Practices for Environmental Education: Guidelines for Success* could be especially productive.
- 3) While the amount of environmental education in preservice teacher education needs to be increased at all licensure levels, the early childhood level should be an area of particular focus since it is currently the most neglected level with regard to environmental education exposure.

# ENVIRONMENTAL EDUCATION IN OHIO PRESERVICE TEACHER EDUCATION: A RESEARCH REPORT

## INTRODUCTION

According to the resource guide *Best Practices for Environmental Education: Guidelines for Success*, preservice professional development includes formal education, training, or other learning activities individuals engage in as they prepare to enter a chosen profession (Meredith *et al.*, 2000). For formal K-12 educators, preservice professional development typically consists of a degree and licensure program pursued through a teacher education program at an institution of higher education. For environmental educators working in nonformal educational settings (e.g. parks, nature centers, non-profit organizations, community and governmental agencies), preservice professional development may take place through a variety of avenues, such as other academic departments in colleges and universities and on-the-job training.

Certainly, both the quality and quantity of preservice professional development in environmental education (EE) has a great impact on the quality and quantity of EE offered to potential and actual learners. The first systematic study of EE in preservice teacher education in the United States demonstrated that most teacher education programs have few EE related requirements and do not officially institutionalize EE into their programs (McKeown-Ice, Brayton, & May; 1995). Similarly, a survey of elementary preservice teacher education programs in the state of Pennsylvania found that EE was not widely institutionalized in the state's preservice teacher education programs at the elementary licensure level (Mastrilli, Johnson, & McDonald; 2001). Thus, it appears that most new classroom teachers have not been well prepared through their preservice professional development to incorporate quality EE into their teaching.

In 1996, the Environmental Education Council of Ohio (EECO) began a comprehensive process of planning for the future of environmental education in Ohio. EECO was joined in this process by other partners, including the Ohio Alliance for the Environment, the Ohio Department of Natural Resources, the Ohio Department of Education, the Ohio Environmental Protection Agency, Ohio State University Extension, and the Science and Mathematics Network. The result was *Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio* (EECO *et al.*, 1999). The plan outlines a strategy for building Ohio's ability to promote reform-based environmental education that is interdisciplinary, community-based, and learner-centered.

The Ohio EE 2000 *Strategic Plan* presents seven key objective areas with associated action items. Key area four addresses training and professional development. It states, "Programs to assist people in becoming effective environmental educators will be put in place" (EECO *et al.*, 1999). Key area four encompasses six different action items, five of which deal with the preservice preparation of environmental educators in Ohio. The first of these, action item 4.1, states:

*Determine the current amount of environmental education provided in preservice teacher education programs and establish a system for periodic assessment.*

The intent of this action item is to direct the collection of baseline data on the status of environmental education within Ohio's preservice teacher education programs to enable appropriate priority setting for addressing preservice training in environmental education. Further, the action item specifies that the amount of EE in preservice teacher education should be monitored periodically to determine success or progress in this area.

Accordingly, the purpose of the study described here was to assess the amount and content of environmental education in preservice teacher education programs in the state of Ohio to provide a baseline for future action and assessments.

Recognizing that much preservice education of practicing environmental educators occurs in academic departments and programs other than teacher education programs, another objective of this study was to investigate EE related offerings in these non-teacher education departments and programs across the state.

## **METHODS**

To assess the amount and content of EE in preservice teacher education, a survey instrument was sent to all 51 institutions of higher education in the state of Ohio with preservice teacher education programs. The instrument was developed by a work group appointed by the Steering Committee of Ohio EE 2000 (now called EEOhio), the statewide initiative to implement *Ohio EE 2000: A Strategic Plan for Environmental Education in Ohio* (EECO *et al.*, 1999). The Project Director for Ohio EE 2000 facilitated and gave oversight to the work group.

The work group consisted of eight individuals: two faculty members from two different teacher education programs in Ohio, two faculty members representing academic departments other than teacher education departments, one public school secondary science teacher, one higher education staff member working with a university based teacher inservice program, one higher education staff member specializing in survey design and analysis, and the Project Director for Ohio EE 2000 (now EEOhio). The group developed the survey instrument by reviewing and adapting two existing instruments: one from a national study conducted by the Environmental Literacy Assessment Consortium and the Center for Geography and Environmental Education at the University of Tennessee, Knoxville; and one from a survey of elementary preservice teacher programs in Pennsylvania, conducted by the Pennsylvania Department of Education, the State System of Higher Education, and the Pennsylvania Center for Environmental Education.

The resulting draft instrument was field tested and pilot tested with a small sample of teacher education faculty members from higher education institutions in states other than Ohio. Based on the results of the pilot test, minor revisions were made to the draft instrument to produce the final instrument. The resultant final instrument was formatted

by the work group member specializing in survey design into an eight page, letter-sized booklet (Appendix A).

The final instrument contained six items requesting information about the institution (e.g. numbers of students and faculty, contact information), three items on EE courses offered by the institution, two items requesting a subjective assessment of the institution's effectiveness in conveying EE content, two items on other EE offerings (e.g. majors, minors, specializations), four items on specific EE content (e.g. concepts, curricula, methods), one item on perceived barriers and supports to including EE in preservice teacher education programs, and one open-ended item for additional comments.

The survey instrument was mailed in February, 2001, via the U.S. Postal Service to all 51 institutions of higher education in the state of Ohio with preservice teacher education programs. Prior to mailing, the office of the dean or director of teacher education at each institution was contacted by phone to determine the most appropriate person at that institution to receive and complete the survey. The mailing packet consisted of a cover letter, fact sheet on Ohio EE 2000 (now EEOhio), survey booklet, large postage paid return envelope, and a postage paid post card on which respondents could indicate other faculty at their institution with an interest in EE (see below).

The cover letter explained the purpose of the research project and presented a broad definition of EE to be used for the purpose of responding to the survey, as follows:

*The goal of environmental education is to help students become environmentally aware, knowledgeable, skilled, dedicated citizens who are committed to work, individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things.*

The work group employed many of the methods recommended by Dillman (2000) for distribution, collection, and follow-up of the questionnaire. For instance, the cover letter was hand signed in ink by the Project Director, and each packet was mailed by first class postage with hand-placed postage stamps. After the return deadline specified in the cover letter, a minimum of two rounds of phone follow-ups were conducted with nonrespondents to ensure the best possible response rate. Additional copies of the survey were provided to nonrespondents via regular mail or e-mail.

In order to investigate EE related offerings in academic departments other than teacher education programs in Ohio's higher education institutions, an informal e-mail survey was conducted from May to October of 2001. The survey (Appendix B) consisted of 11 open-ended items asking respondents to describe the nature and scope of their and their departments' involvement with EE or EE related activities. The survey was sent with a short introductory message presenting background on the project and the same broad definition of EE presented in the cover letter mailed with the teacher education survey, above.

The sample for the informal e-mail survey was derived from responses returned on the postage paid post cards mailed in the survey packet to teacher education programs across the state (see above). On this post card respondents to the teacher education survey were asked to identify faculty members in other departments at their institutions with an interest in EE. Faculty members known to the work group and Ohio EE 2000 Steering Committee to have an interest in EE were also included in the sample for the e-mail survey. In addition, the e-mail survey itself used a snowball technique to identify other faculty members around the state with an interest in EE, and these individuals were, in turn, sent the e-mail survey.

## **RESULTS**

### **Survey of Ohio Teacher Education Departments**

A total of 38 institutions responded to the survey mailed to the 51 Ohio institutions with preservice teacher education programs, for a response rate of 74% (See Appendix C for a list of responding institutions). However, one of the responding institutions responded only by sending a list of environmentally related courses offered at that institution, making the effective response rate for the survey 72%. Of the 38 total responding institutions, 26 were private institutions, and 12 were public. It is important to note that, while the response rate to the survey was favorable, three institutions with three of the largest teacher education programs in the state did not respond.

The state of Ohio currently certifies teachers at three licensure levels: early childhood (grades preK – 3), middle childhood (grades 4-9), and adolescent/young adult (grades 7-12). Survey respondents were asked to estimate the number of students per year completing preservice teacher education programs at each of these levels at their institutions. Thirty-four of the 38 responding institutions responded to this item, indicating a total of 3,517 students completing programs each year. Thus the data collected through the survey represents a minimum of 3,517 preservice teacher education students per year. Approximately 7,000 students complete teacher education programs and meet the requirements of a four-year certificate or two-year license in the state of Ohio each year (David Todt, personal communication). For example, the number for the 1999-2000 academic year was 7,053 (Ohio Department of Education, 2001). The data collected through this survey therefore can be assumed to represent about half of the students completing preservice teacher education programs in Ohio at the time the data were collected.

### **Profile of Responding Institutions**

Figure 1 shows the numbers of students per year completing preservice teacher education programs at the early childhood, middle childhood, and adolescent/young adult licensure levels at responding institutions.

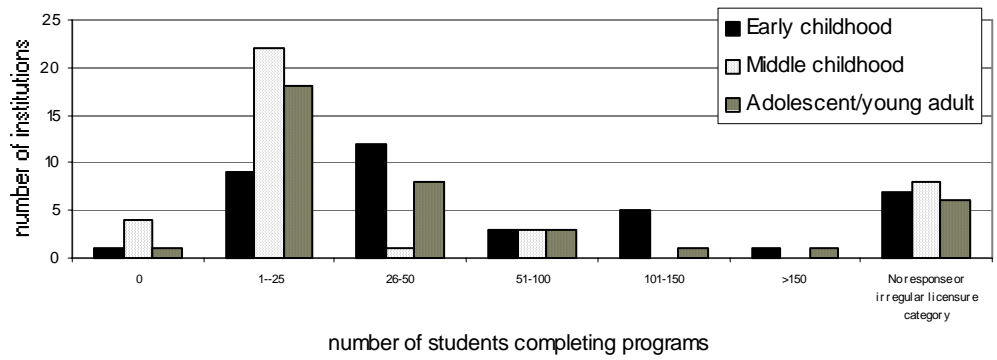


Figure 1. Number of students per year completing preservice teacher education programs at responding institutions.

As can be seen from the figure, the majority of responding institutions prepare relatively small numbers of students (0-25) at the middle childhood level (68%) and adolescent/young adult levels (50%). At the early childhood level, 26% of responding institutions prepare 0-25 students per year, and approximately 32% prepare 26-50 per year. Approximately 24% of respondents report that they prepare over 50 students at the early childhood level, while only 8% prepare over 50 at the middle childhood level and 13% at the adolescent/young adult level.

Figure 2 shows the number of faculty in teacher education programs at responding institutions.

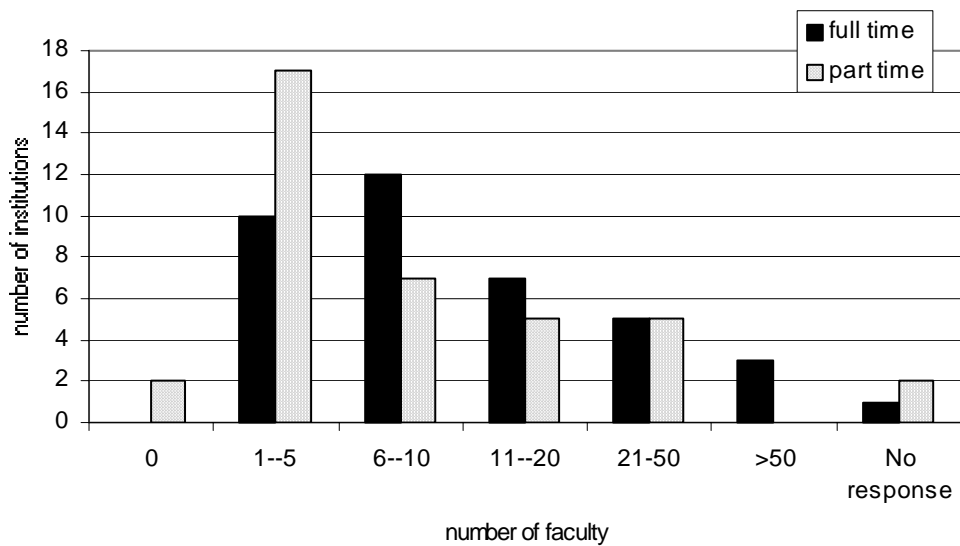


Figure 2. Number of faculty in teacher education programs at responding institutions.

These data indicate that the responding institutions as a whole tend to have smaller faculties, with 58% having full time faculties of 10 or fewer, and 68% having part time faculty members of 10 or fewer. Thirty-nine percent of responding institutions report full time faculties of greater than 10, and 26% report greater than 10 part time faculty members.

Responding institutions reported that a total of 16 full time faculty members, or 2% of the full time faculty at responding institutions, specialize in environmental education. Ten-part time faculty members, or 3% of the part time faculty, specialize in EE. Twenty-three of the 38 responding institutions (60%) have no full or part time faculty who specialize in environmental education.

### **Amount and Content of Environmental Education**

When asked what specific courses the institution recommends to students interested in teaching about the environment, half of responding institutions (50%) reported that they recommend biology courses (see Table 1), including general or traditional biology courses (21%), ecology (13%), and environmental biology (5%). Within the biology area, environmental ecology, environmental microbiology, field biology, and natural history were all also mentioned by one institution each. Approximately 21% of responding institutions reported recommending courses in environmental programs, such as environmental studies, environmental science, or environmental management. Nearly 16% reported recommending education courses, such as science methods (5 institutions) or other education courses (one institution). Other academic areas where courses are recommended were chemistry, geology, physics, specific teacher licensure programs, and other programs such as internships and independent studies and outdoor education.

When asked if courses related to EE are taught in departments or programs other than the preservice teacher education program at their institutions, 24 respondents (63%) responded “yes,” seven (18%) responded “no” and seven responded “do not know.”

Table 2 summarizes the courses reported in response to this survey item. As Table 2 shows, the two most frequent categories of courses reported were environmental programs, reported by 42% of respondents, and biology, reported by 32%.

Table 1. Courses recommended by responding institutions to teacher education students interested in teaching about the environment.

<b>Course category</b>	<b>Number of institutions recommending/ percent* of responding institutions</b>
<b>Biology</b>	<i>19 (50%)</i>
<ul style="list-style-type: none"> <li>• General/traditional biology courses</li> <li>• Ecology</li> <li>• Environmental biology</li> <li>• Environmental ecology</li> <li>• Environmental microbiology</li> <li>• Field biology</li> <li>• Natural history</li> </ul>	<ul style="list-style-type: none"> <li>8 (21%)</li> <li>5 (13%)</li> <li>2 (5%)</li> <li>1 (3%)</li> <li>1 (3%)</li> <li>1 (3%)</li> <li>1 (3%)</li> </ul>
<b>Chemistry</b>	<i>2 (5%)</i>
<ul style="list-style-type: none"> <li>• General/traditional chemistry courses</li> <li>• Environmental chemistry</li> </ul>	<ul style="list-style-type: none"> <li>1 (3%)</li> <li>1 (3%)</li> </ul>
<b>Education</b>	<i>6 (16%)</i>
<ul style="list-style-type: none"> <li>• Science methods</li> <li>• Other education courses</li> </ul>	<ul style="list-style-type: none"> <li>5 (13%)</li> <li>1 (3%)</li> </ul>
<b>Environmental Programs</b>	<i>8 (21%)</i>
<ul style="list-style-type: none"> <li>• Environmental management</li> <li>• Environmental science</li> <li>• Environmental studies</li> </ul>	<ul style="list-style-type: none"> <li>1 (3%)</li> <li>5 (13%)</li> <li>6 (16%)</li> </ul>
<b>Geology</b>	<i>5 (13%)</i>
<ul style="list-style-type: none"> <li>• General/traditional geology courses</li> <li>• Environmental geology</li> </ul>	<ul style="list-style-type: none"> <li>2 (5%)</li> <li>3 (8%)</li> </ul>
<b>Physics</b>	<i>2 (5%)</i>
<ul style="list-style-type: none"> <li>• Environmental physics</li> <li>• “20<sup>th</sup> Century Physics”</li> </ul>	<ul style="list-style-type: none"> <li>1 (3%)</li> <li>1 (3%)</li> </ul>
<i>Teaching Licensure Programs</i>	<i>3 (8%)</i>
<ul style="list-style-type: none"> <li>• Earth science</li> <li>• Life science</li> <li>• Physical science</li> </ul>	<ul style="list-style-type: none"> <li>1 (3%)</li> <li>1 (3%)</li> <li>1 (3%)</li> </ul>
<b>Other</b>	<i>4 (10%)</i>
<ul style="list-style-type: none"> <li>• Internships &amp; independent study</li> <li>• Natural History Museum courses</li> <li>• Outdoor education</li> <li>• “Technology &amp; Society”</li> </ul>	<ul style="list-style-type: none"> <li>1 (3%)</li> <li>1 (3%)</li> <li>1 (3%)</li> <li>1 (3%)</li> </ul>
<b>No response/Do not know</b>	<i>8 (21%)</i>

\*Subcategories may not total to category totals due to rounding.

Table 2. Courses related to environmental education taught by departments other than teacher education departments at responding institutions.

<b>Course category</b>	<b>Number of institutions offering /percent* of responding institutions</b>
<b>Biology</b>	<i>12 (32%)</i>
• General/traditional biology courses	5 (13%)
• Ecology	4 (10%)
• Environmental biology	2 (5%)
• Field biology	1 (3%)
<b>Chemistry</b>	<i>1 (3%)</i>
• “Pollution of the Environment”	1 (3%)
<b>Environmental Programs</b>	<i>16 (42%)</i>
• Environmental engineering	<b>1 (3%)</b>
• Environmental management	1 (3%)
• Environmental science	5 (13%)
• Environmental studies	8 (21%)
• Water resources management	1 (3%)
<b>Geology</b>	<i>2 (5%)</i>
• General/traditional geology courses	1 (3%)
• Environmental geology	1 (3%)
<b>Physics</b>	<i>1 (3%)</i>
• Environmental physics	1 (3%)
<b>Other</b>	<i>4 (10%)</i>
• Internships & independent study	2 (5%)
• “Math & Environment”	1 (3%)
• “Technology & Society”	1 (3%)
<b>Do not know</b>	8 (21%)

\*Subcategories may not total to category totals due to rounding.

Respondents were asked to estimate the percentage of students in all preservice teacher education programs at their institutions who are exposed “in any way” to environmental education (see Figure 3).

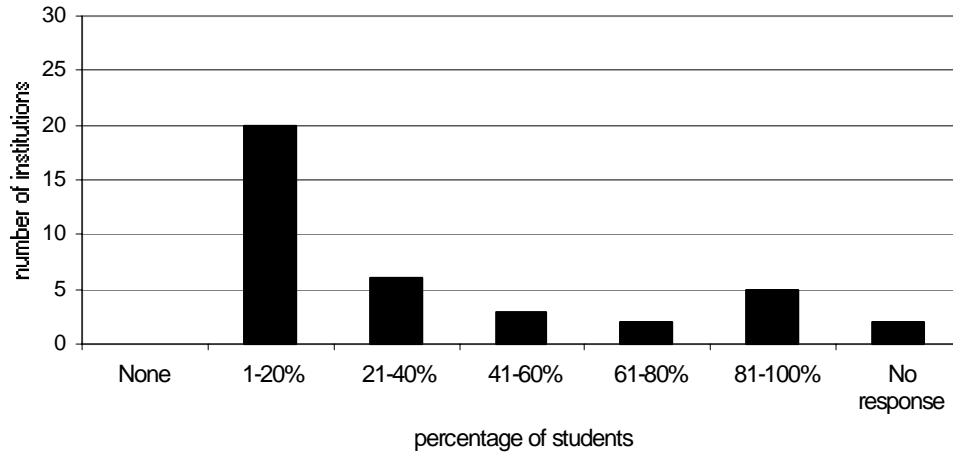


Figure 3. Percentage of teacher education students at responding institutions who are exposed to environmental education.

No institutions reported that “none” of their students are exposed to EE, but 20 institutions (approximately 53% of respondents) reported that only 1-20% are exposed to EE. However, five institutions (about 13%) reported that 81-100% of their students are exposed to EE. Considering the total numbers of students represented by all responding institutions, and the institutions’ estimates of student exposure, we can calculate that about 22-39% of all teacher education students at responding institutions are exposed to EE “in any way.”

When asked if students in their preservice teacher education program are required to take a course in environmental education, the majority of responding institutions responded “no” at all three licensure levels (71% at the early childhood level, 53% at middle childhood, and 66% at adolescent/young adult) (see Figure 4).

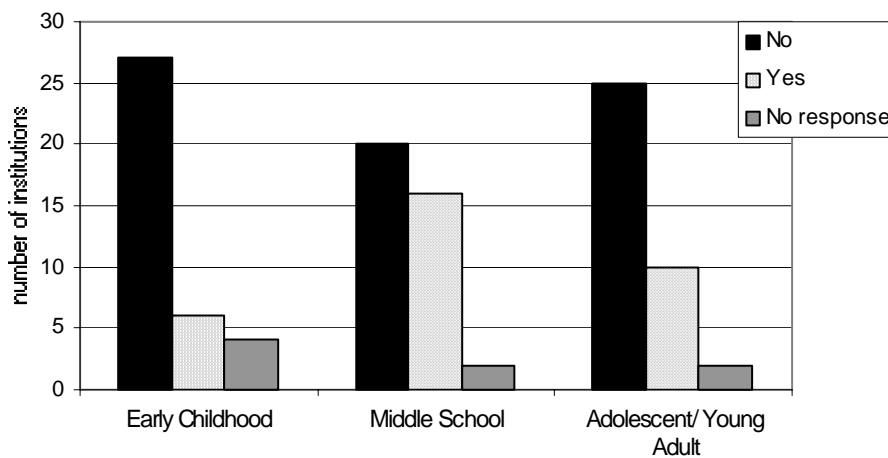


Figure 4. Number of responding institutions requiring teacher education students to take a course in environmental education.

However, at the middle childhood level, 16 institutions (42%) do require a course in EE, followed by 10 (26%) at the adolescent/young adult level, and six (16%) at the early childhood level. One institution requiring a course at the middle childhood level noted that this was true only for students in the science concentration. Five of the institutions requiring a course at the adolescent/young adult level only do so for science majors.

Overall, 16 institutions (42%) require a course in EE at one or more licensure levels. Five of these institutions require it for all three levels, six require it at two out of three levels, and five require the course at only one level, the middle childhood level. According to the information provided by respondents, most of these required EE courses are taught in departments other than the institution’s teacher education department, such as biology or other sciences, or environmental science or studies programs.

Figure 5 shows the number of responding institutions preparing preservice teacher education students in knowledge of environmental issues. At the early childhood level, 79% of responding institutions do not provide such preparation, and 66% percent do not provide it at the middle childhood or adolescent/young adult levels. The largest number of institutions reporting that they do provide such preparation was 10 (26%) for the middle childhood level. Of these 10 institutions, seven also require a course in EE at one or more licensure levels. As with required courses in EE, as noted above, most of the preparation in environmental issues seems to occur in departments other than teacher education departments. One institution commented that, while they do not require preparation in environmental issues, some preparation for this is included in the institution’s methods courses.

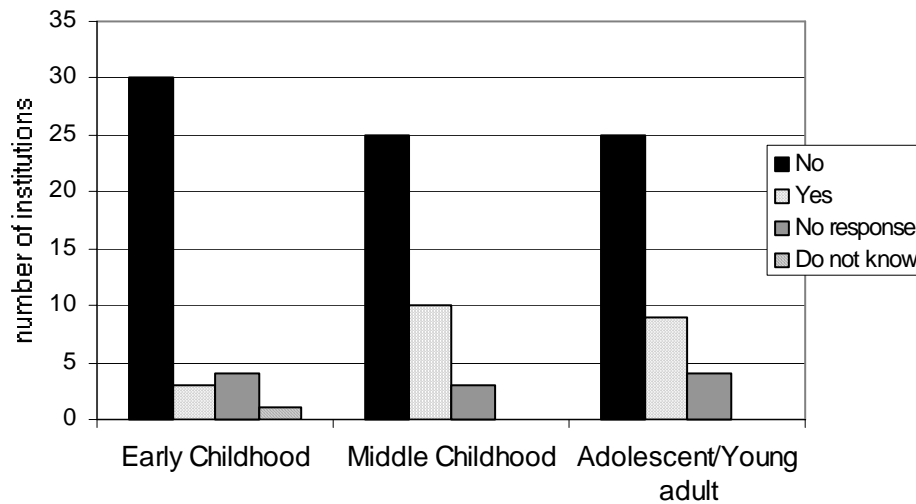


Figure 5. Number of responding institutions requiring teacher education students to take coursework in environmental issues.

As Figure 6 shows, only three responding institutions offer a major or minor in environmental education, while two offer a concentration and one offers a specialization in EE. All of the institutions who offer a major, minor, concentration, or specialization also require students to take a course in EE at one or more licensure levels.

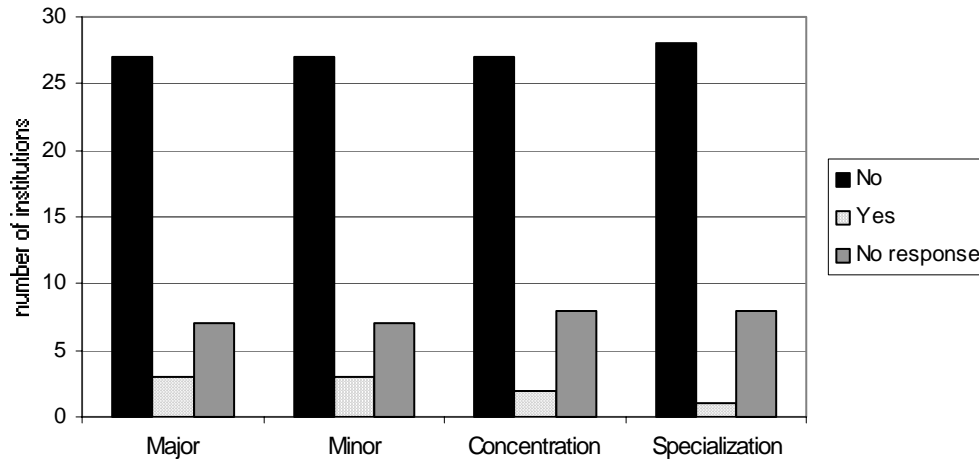


Figure 6. Number of responding institutions offering a major, minor, concentration, or specialization in environmental education.

Six institutions (16% of respondents) reported that students can have a practicum, internship, or field experience in EE for credit in the preservice teacher education program at their institutions. Students obtain this experience through elective hours (1 respondent), at nearby parks or nature centers (3 respondents), or as part of a science licensure program (1 respondent).

### **Barriers to the Inclusion of Environmental Education**

Table 3 gives the mean rating by responding institutions for 12 factors which may serve as either barriers or supports to the development of environmental education components in a preservice teacher education program. For the rating scale provided, “1” represents a strong barrier, while “5” represents a strong support. The lowest mean rating was for the factor “available course time” (1.62), while the highest was for “student interest in EE” (3.08). Even this highest rating, however, represents a neutral response of “neither a barrier nor a support.” Thus, none of the twelve factors were rated as a support for the inclusion of EE in preservice teacher education programs. Also notable are standard deviations greater than 1.00 for nine of the twelve factors, indicating some degree of disagreement among responses for these factors. The sources of this disagreement are unclear. Possibly differences in characteristics between individual institutions contribute to disparate responses between institutions. For example, for “faculty interest in EE,”

four out of five of the institutions who rated this factor a strong support have a least one faculty member specializing in EE. None of the institutions rating this factor a strong barrier have any faculty members specializing in EE. The same is true for “faculty knowledge related to EE.”

Table 3. Mean rating for factors serving as barriers or supports to the development of EE components in the preservice teacher education programs of responding institutions. A “1” represents a strong barrier, “3” represents neither a barrier nor a support, and “5” represents a strong support. Unless otherwise noted, n=37.

<b>Factor</b>	<b>Mean rating</b>	<b>Standard deviation</b>
Available course time	1.62	0.97
State certification guidelines	2.05	1.15
Available faculty preparation time	2.08	1.00
Funding	2.35 (n=34)	0.94
Institutional tradition	2.59	1.20
Faculty knowledge of EE methods	2.64 (n=36)	1.34
Professional association guidelines & standards	2.65	1.19
Administrative support for EE	2.76	1.02
Faculty interest in EE	2.76	1.36
Access to EE resources	2.84	0.86
Faculty knowledge related to environment and environmental issues	2.94	1.37
Student interest in EE	3.08	1.15

Table 4 lists open ended responses provided by some respondents for barriers or supports to the inclusion of EE in teacher education programs. Six respondents commented that resources are not allocated to EE in their preservice teacher education programs because it is not a state requirement or licensure category. Similar to this comment, four respondents also noted a lack of time to incorporate EE into an already tight program.

Table 4. Factors named in open-ended comments as barriers to the development of EE components in preservice teacher education programs.

<b>Factor/Comment</b>	<b>Number of respondents naming factor</b>
EE is not a state requirement or licensure category, so resources are not allocated to it	6
Lack of time to incorporate EE into an already tight program	4
Structure of the program makes it difficult (i.e. prerequisites, etc.)	2
Small institution cannot support too many programs	2
Lack of awareness	1
Lack of faculty to develop and teach courses	1
Job market is unclear for EE teachers	1
NCATE review	1

### **Institutional Effectiveness in Conveying Environmental Education**

Table 5 lists the mean rating, on a scale of one to five, for responding institutions' effectiveness in five areas of environmental education: conveying environmental action strategies related to EE, conveying instructional methods related to EE, conveying environmental content knowledge, educating about environmental issues, and environmental education overall. The highest mean rating was obtained for educating about environmental issues at 2.92 out of a possible 5, and the lowest was obtained for conveying environmental action strategies related to EE (2.42). The second lowest rating, 2.61, was obtained for EE overall, indicating that responding institutions as a whole rate themselves poor to fair in their overall EE effectiveness in preservice teacher education. In fact, three institutions (8%) rated themselves as "not at all" effective in conveying EE overall, 16 (42%) rated themselves as "poor," 11 (29%) as fair, four (10%) as good, and two (5%) as excellent. Thus, about 44% of the responding institutions rated themselves fair or better at conveying EE overall in their preservice teacher education programs.

Table 5. Mean rating for responding institutions' effectiveness in five areas of environmental education. 1=not at all, 2=poor, 3=fair, 4=good, 5=excellent. n=36.

<b>Area</b>	<b>Mean rating</b>	<b>Standard deviation</b>
Conveying environmental action strategies related to EE	2.42	1.11
EE overall	2.61	0.98
Conveying instructional methods related to EE	2.69	1.08
Conveying environmental content knowledge	2.78	0.95
Educating about environmental issues	2.92	1.01

## **Student Exposure to Environmental Education Skills, Content, Methods, and Resources**

As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) has produced *Guidelines for the Initial Preparation of Environmental Educators* (NAAEE, 2000). The guidelines recommend six thematic areas in which environmental educators should acquire skills and competencies during their preservice education. Survey respondents were asked to indicate, on a scale of one to five, their degree of familiarity with these guidelines. As seen in Figure 7, nearly half of the respondents (45%) indicated that they had never heard of the guidelines. Eight (21%) reported that they were somewhat familiar with the guidelines, while only one respondent reported being very familiar with them.

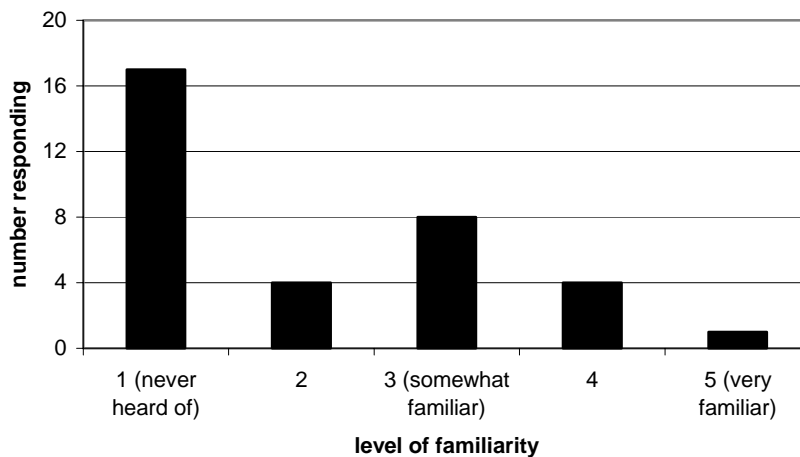


Figure 7. Frequency of response for respondents' familiarity with NAAEE's *Guidelines for the Initial Preparation of Environmental Educators*. Mean response = 2.06. Standard deviation = 1.21. n=34.

Figure 8 shows the number of responding institutions at which preservice teacher education students are exposed to the skills and content areas recommended in the NAAEE guidelines. Seventeen responding institutions (45%) reported that students are exposed to “assessment and evaluation,” “fostering learning,” and “environmental literacy” at one or more licensure levels. Twelve institutions (32%) report this for “planning and implementing EE programs” and “foundations of EE,” and 10 (26%) report it for “professional responsibilities of the environmental educator.” For all six skill and content areas, fewer institutions report exposure for students at the early childhood level than for the middle childhood or adolescent/young adult levels. One respondent indicated that student exposure in these areas occurs through an elective rather than a required experience. Three respondents indicated that environmental literacy is addressed at the middle childhood level, but only for students in a science major or concentration. This was also reported by four respondents for the adolescent/young adult level. One respondent indicated that all the skill and content areas were addressed for science majors only.

Figure 9 shows the frequency of responding institutions at which students are introduced to a variety of environmental education resources. The three most frequently offered resources at one or more licensure levels were Project WILD, Project Wet, and Project Learning Tree, with 20 (53%), 15 (40%), and 11 (29%), respectively, of responding institutions offering them. These three resources were also the most frequently offered in elementary teacher education programs in Pennsylvania, as demonstrated by a recent survey research project in that state (Mastrilli, Johnson & McDonald; 2001). This is not surprising given the long history and national focus of each of these programs. For each of these three resources the highest frequency of offering reported in our survey was at the middle childhood level. Also notable is the relatively high number of “do not know” responses to this item. One respondent commented that some students “get these on their own.” Another noted that it depends on who is teaching courses as to which resources are offered. One commented that Zero Population Growth materials are “not allowed at our college.”

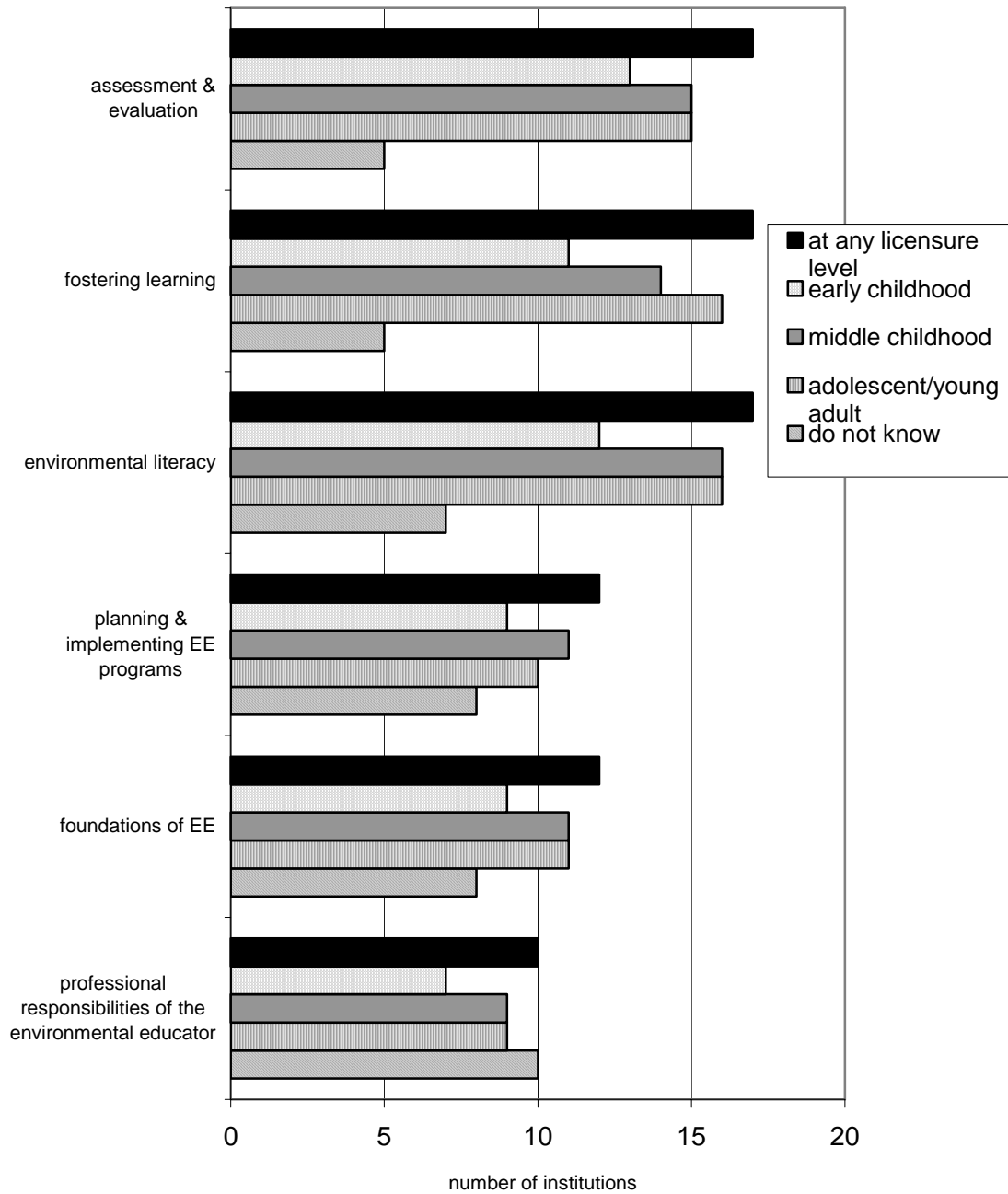


Figure 8. Number of responding institutions (n=38) where preservice teacher education students are exposed to skills and content areas found in NAAEE's *Guidelines for the Initial Preparation of Environmental Educators* at different licensure levels.

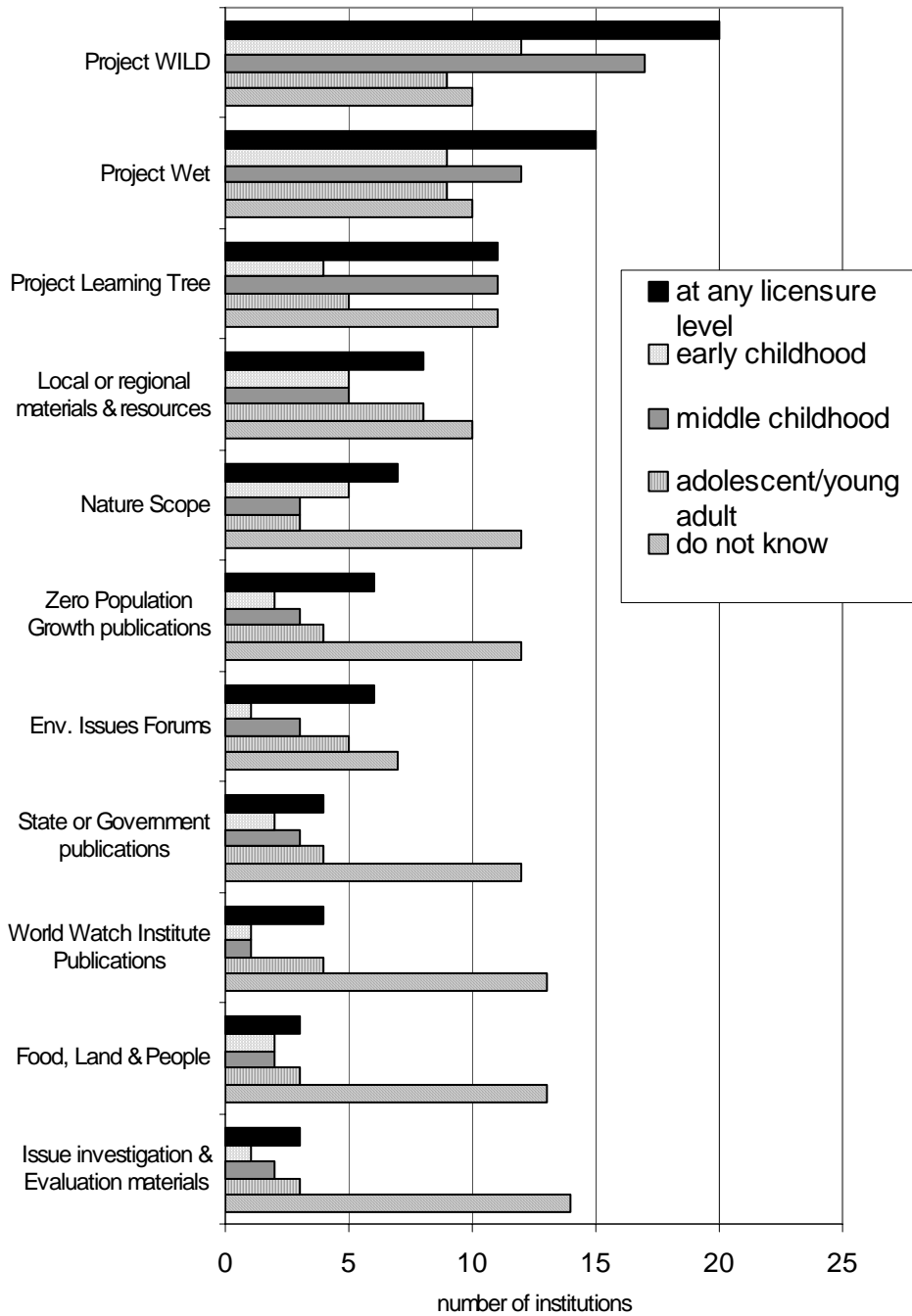


Figure 9. Number of responding institutions (n=38) where preservice teacher education students are introduced to various EE resources at different licensure levels.

Survey respondents were asked to indicate whether students in their preservice teacher education programs are taught a variety of instructional methods related to environmental education at the three levels of licensure. As Figure 10 shows, the frequencies of institutions teaching these methods at one or more licensure levels is fairly high, with the highest being 28 institutions (74% of respondents) teaching “discussions,” and the lowest being 14 (37%) for “values analysis and clarification.” One respondent commented that all of these methods are taught, but not within the context of environmental education. This raises the possibility that many of the responding institutions who teach these methods do so independently of any specific content area(s), including EE. In fact, the three lowest frequencies of teaching (issue investigations, field research, and values analysis and clarification) are for methods which could be considered more closely aligned with environmental education than many of the other methods. However, two other methods commonly associated with EE, field trips and outdoor teaching strategies, are taught at fairly high frequencies, 60% and 58% respectively.

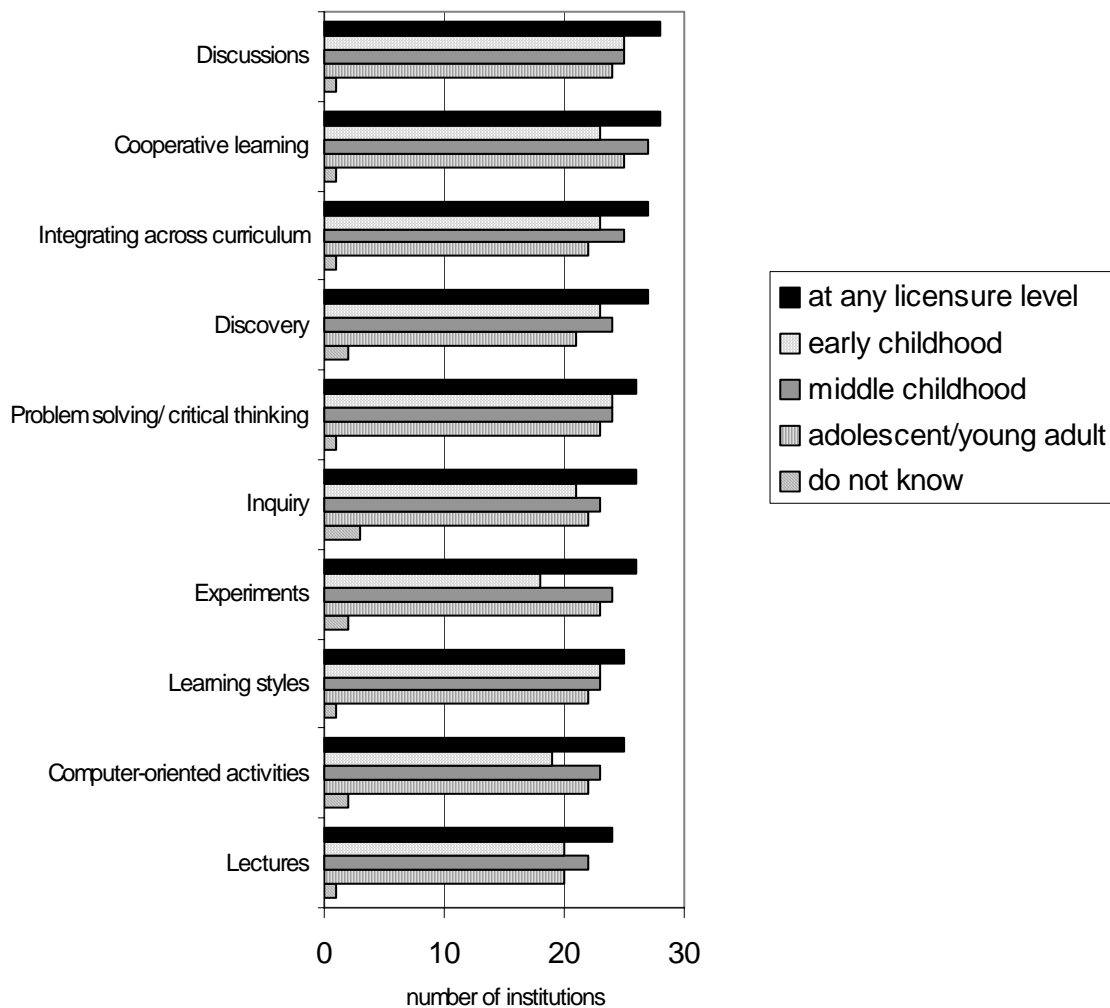


Figure 10. Number of responding institutions (n=38) where preservice teacher education students are taught instructional methods related to EE at different licensure levels.

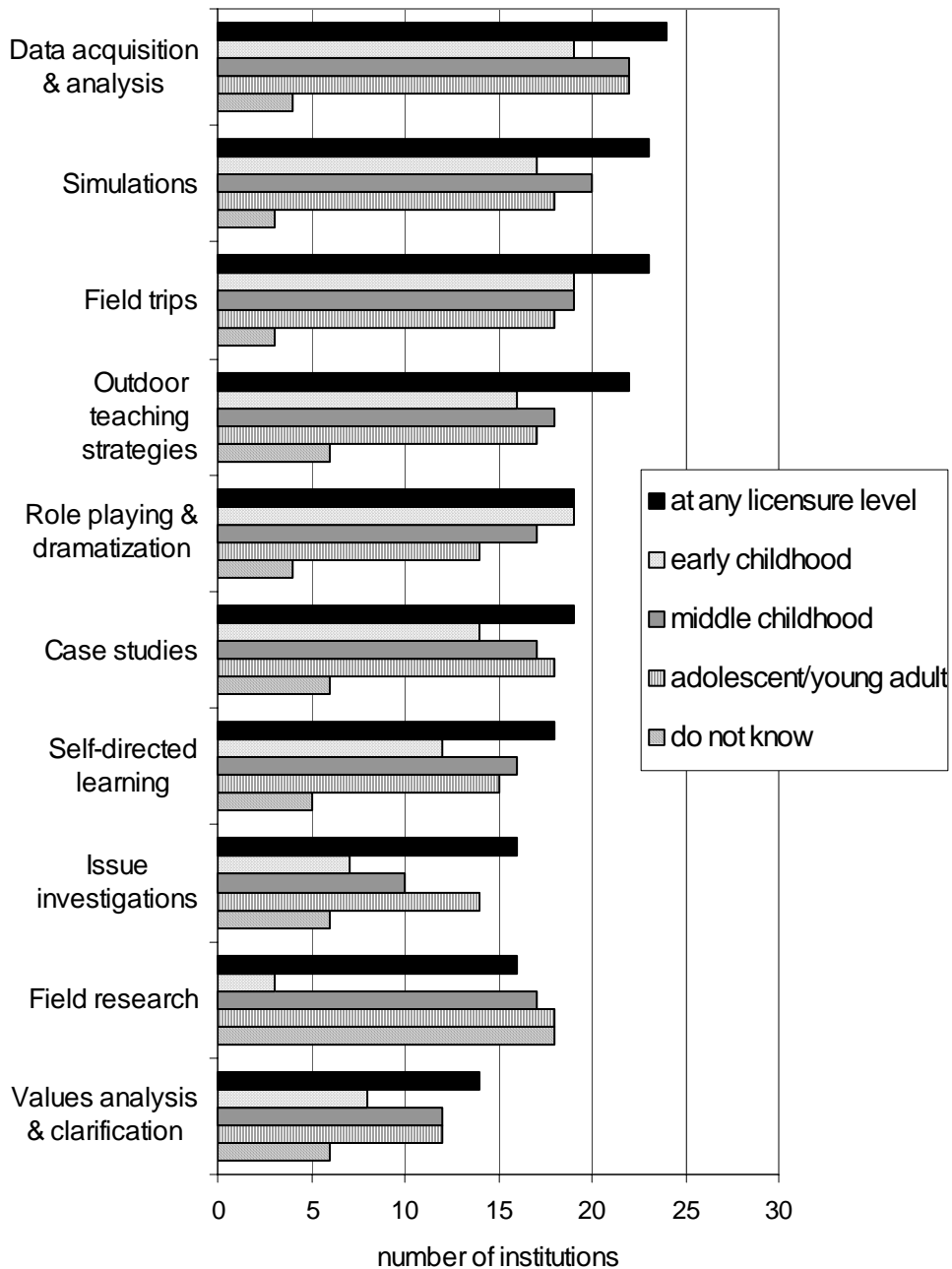


Figure 10 (cont.) Number of responding institutions (n=38) where preservice teacher education students are taught instructional methods related to EE at different licensure levels.

The data presented in Figure 10 suggest that, as a whole, the teaching methods in question are taught with the highest frequency at the middle childhood licensure level. Ten of the 20 methods are reportedly taught more frequently at the middle childhood level than at the early childhood or adolescent/young adult levels. In contrast, one of the 20 methods is taught most frequently at the early childhood level, while 10 of the 20 are

taught least frequently at the early childhood level than at the other two levels. Three of 20 methods are taught most frequently at the adolescent/young adult level, while seven are taught least frequently at this level.

Figure 11 shows the number of responding institutions who offer professional development in environmental education at the graduate level or through continuing or inservice education. Six institutions offer EE at the graduate level, while 10 offer EE through continuing education and 10 through inservice education.

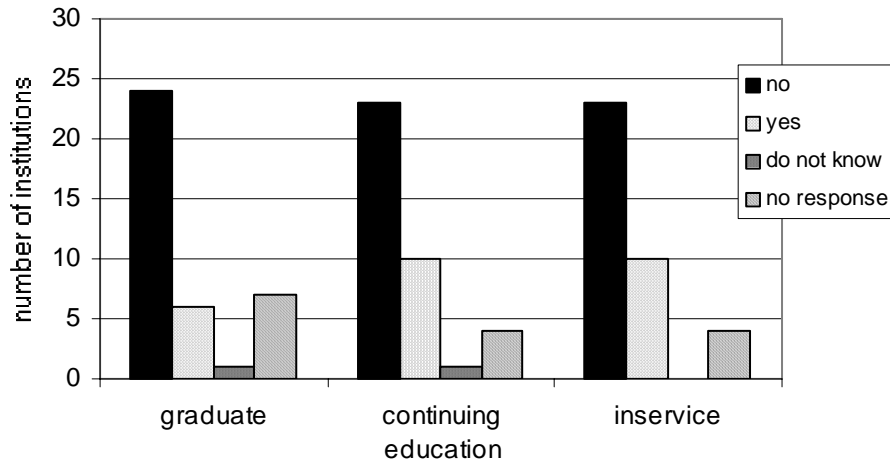


Figure 11. Number of responding institutions who report offering professional development in EE through graduate education, continuing education, or inservice education.

### E-Mail Survey of Non-Teacher Education Departments

The sample size for the informal e-mail survey of non-teacher education departments consisted of 36 individuals from fourteen different institutions. Seventeen individuals representing 11 institutions responded, for an individual response rate of 47% and an institutional response rate of 78%.

Table 6 shows the department(s) or program(s) in which respondents to the survey teach at their institutions.

Table 6. Academic department(s) or program(s) in which e-mail survey respondents teach.

<b>Department/program</b>	<b>Number of respondents</b>
Biology	7
Environmental Studies	4
Math	3
Natural Science	3
Zoology	2
Computer Science	1
Environmental Health	1
Interdisciplinary Studies	1
Natural Resources	1
Recreation & Sports	1

Table 7 shows the ways in which these departments or programs are involved with environmental education. Over half of the respondents reported that their department or program teaches courses for preservice educators, including both preservice classroom teachers and those who intend to teach in nonformal educational settings.

Table 7. Ways in which e-mail survey respondents' departments or programs are involved with environmental education.

<b>EE Involvement</b>	<b>Number of responses</b>
Teach courses for preservice educators	10
Offer internships, field experiences, service learning	4
Teach courses for non-educators	4
Conduct inservice for educators	3
Conduct programs for audiences outside the institution (i.e. schoolchildren, youth)	2
Faculty involvement in statewide initiatives	1

When asked to list environmental education courses offered through their departments or programs, respondents named a variety of courses in areas such as biology, environmental science and environmental studies, chemistry, and environmental health. However, only three respondents (from three different institutions) named courses in which course content appears to specifically focus on environmental education as a discipline. The departments or programs represented by these three respondents were environmental studies, natural resources, and sports and recreation, where courses in outdoor recreation and education are taught.

Six respondents reported that their department or program offers internships or field experiences in environmental education, and four reported offering a major, minor, or concentration in EE. One respondent's department offers a biology education major. One institution offers a major in outdoor education, and another offers a minor in this area. Over half of the respondents (10) reported that their department or program works cooperatively in some way with their institution's teacher education department.

Table 8 presents reasons for how respondents' departments or programs became involved with environmental education. Over half of the respondents cited faculty interest as the main reason for this involvement. In some cases, respondents reported that one faculty member was hired with a strong interest, which inspired a growth in EE involvement in the department. Two institutions became involved because of outside opportunities that were presented to them. In one case a local park district requested the department's involvement, and in another, a bequest of land to the university led to the establishment of a nature center.

Table 8. Reasons given as to how e-mail survey respondents' departments or program became involved with environmental education.

<b>Reason for becoming involved with EE</b>	<b>Number of respondents</b>
Faculty interest	9
Integral to department or program's activities	3
Institutional history	3
Department services teacher education program	3
Outside opportunities	2

Figure 12 shows the number of respondents who reported that students in their departments or programs plan to work as formal educators (classroom teachers); nonformal educators in facilities like parks, nature center, and zoo; or both.

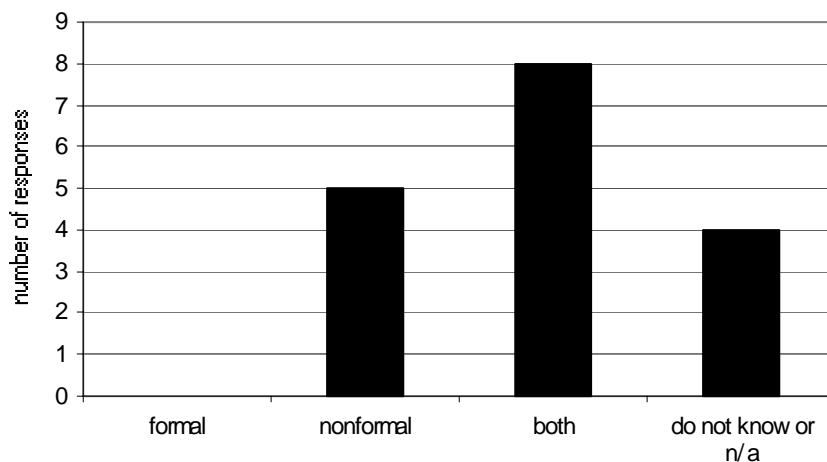


Figure 12. Number of e-mail survey respondents (n=17) reporting that students from their departments or programs plan to work as formal educators, nonformal educators, or both

No respondents reported that their students plan to work exclusively as formal educators.

Survey respondents were asked if they are familiar with NAAEE's *Guidelines for the Initial Preparation of Environmental Educators* (NAAEE, 2000), and if so, whether they incorporate the guidelines recommendations into their programs. Over half of the respondents (9) reported that they were not familiar with the guidelines (see Figure 13). Six said they were familiar, but they do not incorporate them into their programs. Only three respondents were familiar with the guidelines and also incorporate them.

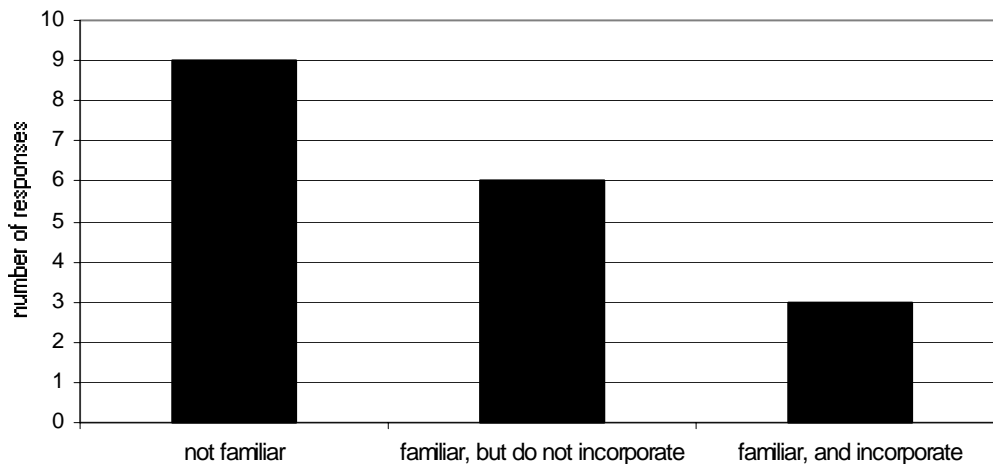


Figure 13. Number of e-mail survey respondents (n=17) reporting various levels of familiarity with NAAEE's *Guidelines for the Initial Preparation of Environmental Educators*.

Figure 14 presents respondents' estimation of whether the environmental education components of their programs are growing, staying the same, or declining. Not quite half estimate that their EE components/involvement are growing, but only two believe it is declining. Some of the things respondents feel they are doing well are

- Learning how to assess inquiry-based learning in courses,
- Incorporating a strong science background and non-emotional treatment of environmental issues,
- Broadly defining EE so students see education is key to addressing issues,
- Working with inservice teachers,
- Having a strong interdisciplinary focus, and
- Providing individual attention to students.

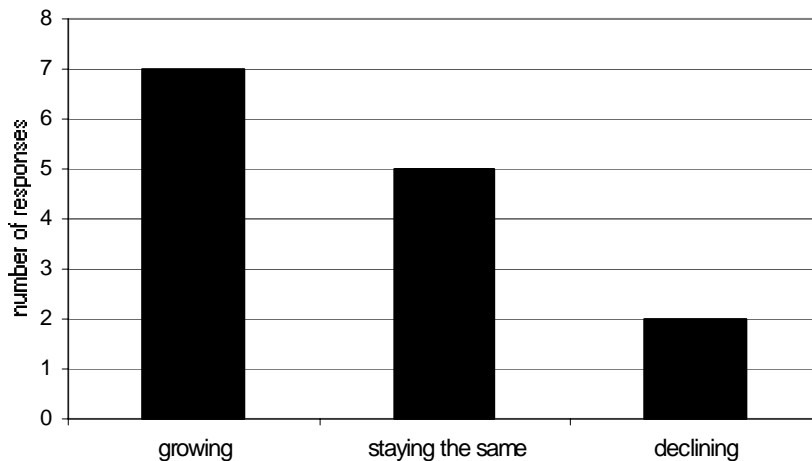


Figure 14. Number of e-mail survey respondents (n=17) reporting that their programs' EE involvement is growing, staying the same, or declining.

Respondents listed the following for what they “would like to be doing differently”:

- Need more expertise and help,
- Tailoring program more to the community,
- More with risk communication and field experiences for students,
- Need more financial support for students,
- Growth will be contingent on administrative support,
- Would like to involve undergraduates in educating K-12 students, and
- Need to publicize opportunities more.

## DISCUSSION

The results of this study suggest a variety of patterns in the status of preservice education related to environmental education in Ohio. These are discussed in the sections below.

### **Environmental Education is Not Institutionalized in Preservice Teacher Education**

Previous studies of environmental education in preservice teacher education have concluded that EE is not institutionalized in preservice teacher education programs (McKeown-Ice, Brayton, & May; 1995; Mastrilli, Johnson, & McDonald; 2001). The results of this study also suggest that EE is not well institutionalized in the preservice teacher education programs in Ohio. First, half of the survey respondents reported that they recommend courses in biology departments to students who are interested in teaching about the environment. This stands in contrast to the percentage who recommend education courses (about 16%) or specific teacher licensure programs (about 8%). This suggests that faculty in teacher education programs may view environmental

education as being within the realm of the sciences rather than being integral to teacher education. Even among the 16 institutions who require their teacher education students to take a course in EE at one or more licensure levels, most of these required EE courses are taught in departments other than teacher education, such as biology or other sciences, or environmental science or studies programs. Similarly, data from the informal e-mail survey of non-teacher education departments suggest that faculty in these programs may also view learning in the science disciplines as adequate preparation for teaching EE. The majority of these respondents cited science courses as their “EE courses,” and most of the courses cited by these departments do not appear to focus on environmental education as a discipline in and of itself.

Only three institutions responding to the teacher education survey offer a major or minor in environmental education, and only six provide opportunities to receive “for credit” practicums, internships, or field experiences in EE. Less than half of responding institutions report that their students are exposed to the content areas recommended in NAAEE’s *Guidelines for the Initial Preparation of Environmental Educators*. About 45% say their students are exposed to “assessment and evaluation,” “fostering learning,” and “environmental literacy.” It may be that the first two of these are not taught within the context of EE, but rather for all teaching content areas in general, as they may apply to any content area. This may also be the case for the 20 teaching methods related to EE that respondents were asked about in the survey. Responding institutions seem to be doing a relatively good job of teaching these methods. However, as one respondent commented, they may not be taught within the context of EE, but rather for any content area.

Overall, calculations based on the data collected indicate that no more than 39% of all preservice teacher education students in responding institutions are exposed to EE in any way.

Survey respondents are not, however, unaware of their “shortcomings” in the area of EE. As a whole, respondents rated their teacher education programs somewhere between “poor” and “fair” in environmental education overall, with about half of the respondents rating themselves “poor” or “not at all” effective. Eight institutions rated themselves as “good” or “excellent” in environmental education overall. All but one of these eight also require a course in EE at one or more licensure levels, and four of them have one or more full or part time faculty members who specialize in EE, suggesting that these institutions may, in fact, be “good” or “excellent” compared to responding institutions as a whole. Interestingly, the highest mean self-rating for effectiveness in conveying environmental education concepts was for “educating about environmental issues” (2.92 out of a possible 5), while the lowest was for “conveying environmental action strategies” (2.42). One might speculate that the higher rating for “educating about environmental issues” stems from responding institutions’ belief that students are exposed to this in science courses, especially biology courses. “Conveying environmental action strategies,” on the other hand, is commonly associated with EE teaching methodologies, or perhaps social science disciplines.

Why is environmental education not institutionalized in preservice teacher education programs? The data here suggest that teacher education programs find little to support

the inclusion of EE in their programs. When asked to rate 12 factors as to whether they are barriers (rating of 1) or supports (rating of 5) to the inclusion of EE in preservice teacher education, responding institutions returned mean ratings ranging from 1.62 to 3.08 for the 12 factors named in the survey. Thus, overall, none of the 12 factors were considered a support for the inclusion of EE by responding institutions as a whole. The highest mean rating (3.08) was returned for “student interest in EE.” The two strongest rated barriers were 1) a lack of time to incorporate EE into an already tight program, and 2) because it is not a state requirement or licensure category. These ratings are consistent with results obtained in the Pennsylvania study of elementary preservice teacher education, where 86% of respondents identified limited course time as a barrier to the inclusion of EE in their programs (Mastrilli, Johnson & McDonald; 2001). On the other hand, unlike Ohio, Pennsylvania has state standards requiring the teaching of environmental education, and respondents to the Pennsylvania survey cited these standards as positive factors supporting the inclusion of EE in their programs (Mastrilli and Johnson, 2001).

What are the characteristics of institutions who do a better job of including EE in their preservice teacher education programs? If we compare the 16 responding institutions who require preservice teacher education students to take a course in EE with the 20 institutions who do not, there are some differences worth noting. Seven of the institutions requiring an EE course (about 44%) rated “faculty interest in EE” as a moderate or strong support, as opposed to 25% of respondents who do not. Forty-four percent also rated “faculty knowledge of EE methods” and “faculty knowledge of the environment and environmental issues” as moderate or strong supports as opposed to 15% and 25%, respectively, of respondents who do not require an EE course. Six of the institutions requiring a course (about 37%) have one or more faculty members, either full or part time, specializing in EE, versus about 25% of those not requiring a course. Another factor which was rated more frequently as a moderate or strong support was administrative support (25% versus 10%). Similarly, faculty interest was an often cited reason for environmental education involvement and activity among respondents to the informal e-mail survey of non-teacher education departments. Interestingly, only 12% of the institutions who require an EE course rated “access to substantive, up-to-date EE resources” as a moderate or strong support, compared to 20% of those who do not require a course. The frequency of private versus public institutions within the group of 16 who require an EE course was also slightly higher than for responding institutions as a whole (75% versus 68%).

### **Student Exposure to Environmental Education**

As described above, based on the data collected in this survey, we estimate that no more than 39% of the preservice teacher education students at responding institutions are exposed in any way to environmental education. The data also suggest a disparity among the three licensure levels for how well students are being exposed to environmental education during their preservice education. It seems that exposure is generally best at the middle childhood licensure level, and worst at the early childhood level. The largest percentage of responding institutions who require students to take a course in EE do so at the middle childhood level (42%) while the lowest percentage (18%) do so at the early childhood level. For exposure to the skill and content areas recommended in NAAEE’s

*Guidelines for the Initial Preparation of Environmental Educators*, fewer institutions report exposure for students at the early childhood level than for the middle childhood or the adolescent young adult levels. Projects WILD, Wet, and Learning Tree, the three most frequently offered EE teaching resources, are offered most frequently at the middle childhood level by responding institutions. Of the 20 EE-related teaching methods asked about in the survey, 10 are taught most frequently at the middle childhood level while only one is taught most frequently at the early childhood level. Ten of the 20 methods are taught least frequently at the early childhood level than at the other two licensure levels.

### **Faculty Expertise in Environmental Education**

As noted above, faculty interest and knowledge in environmental education may play an important role in supporting the inclusion of environmental education in preservice teacher education programs. Unfortunately faculty expertise in EE in Ohio's preservice teacher education programs appears to be lacking. Almost 45% of respondents to this survey reported that they had never heard of NAAEE's *Guidelines for the Initial Preparation of Environmental Educators*. About 32% reported that they are somewhat familiar or familiar with the *Guidelines*, and only one respondent reported being very familiar. Over half of the respondents to the informal e-mail survey of non-teacher education faculty also reported that they had never heard of the *Guidelines*. In both the teacher education survey and the e-mail survey, these responses came from individuals who had been identified by supervisors or peers as the most appropriate person to complete a survey about environmental education, or as people with an interest in EE. The fact that they are not familiar with a major initiative of the NAAEE, North America's main professional organization for environmental education, points to a need to help faculty working with preservice educators to elevate their level of expertise in environmental education.

Despite the lack of overall faculty expertise in EE among responding institutions, almost 29% (11 institutions) do have one or more full or part time faculty who specialize in EE, a percentage somewhat better than that found in the recent Pennsylvania study of elementary preservice programs, where 85% of responding institutions reported having no faculty specializing in EE (Mastrilli, Johnson & McDonald; 2001). Eight of these institutions also require a course in EE at one or more licensure levels, and four of them rate themselves as "good" or "excellent" in conveying environmental education overall.

### **E-mail Survey of Non-Teacher Education Faculty**

Results from the informal e-mail survey of Ohio faculty in departments other than teacher education departments indicate that non-teacher education departments may play an important role in the preservice professional development of environmental educators. Over half of the respondents reported that their departments or programs teach courses for preservice educators, both preservice classroom teachers and those who intend to teach in nonformal educational settings. Most of these courses seem to be in the science disciplines, and few of them appear to offer courses that focus on EE as a discipline. A few (four) do offer a major, minor, or concentration in EE.

## RECOMMENDATIONS

Several recommendations emerge from the results of this study:

- 1) One of the strongest barriers to the inclusion of environmental education in preservice teacher education in Ohio is that it is not a state certification or licensure area. If environmental education is to become institutionalized in Ohio's preservice teacher education programs, the EE community should consider the establishment of a state certification or licensure category for environmental education. Such a measure would be consistent with the *Ohio EE 2000 Strategic Plan*, which calls for development of "guidelines leading to an environmental education endorsement for all PreK-12 teachers" (EECO *et al.*, 1999, p. 17).
- 2) Given the apparent importance of faculty interest and knowledge in EE as a support to its inclusion in preservice education, the EE community should work to increase the level of interest and knowledge among teacher education and other faculty about EE in Ohio. Special efforts to promote NAAEE's *Guidelines* documents and Ohio's *Best Practices for Environmental Education: Guidelines for Success* could be especially productive.
- 3) While the amount of environmental education in preservice teacher education needs to be increased at all licensure levels, the early childhood level should be an area of particular focus since it is currently the most neglected level with regard to environmental education exposure.

### Recommendations for Further Research

The results of this study suggest possibilities for further research:

- 1) Investigate further the level of faculty knowledge of environmental education, and their perceptions related to EE. Do faculty indeed view EE as a subset of the sciences?
- 2) Track teachers who received exposure to specific EE content during their preservice education to determine their level of implementation of EE in their teaching. For example, to what extent do teachers who were exposed to Project WILD during their preservice education actually utilize Project WILD in their teaching?

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#### **APPENDICES:**

A – Ohio EE 2000 Preservice Teacher Education Survey

B – Informal E-mail Survey of Non-Teacher Education Faculty in Ohio

C – List of Responding Institutions

D – Original Responses to Open-ended Survey Items

APPENDIX A



**Pre-service Teacher Preparation Survey**

The following questions refer to the pre-service teacher preparation programs at your institution and the students participating in those programs. Please answer the following questions to the best of your ability. If after reviewing the survey you feel you are not the appropriate person to complete it, please contact Joyce Meredith at (740) 928-2576 or by email at [downtoearth@voyager.net](mailto:downtoearth@voyager.net).

1. What is the approximate number of students per year who complete pre-service teacher preparation programs in each of the following levels at your institution?

Early Childhood = \_\_\_\_\_ Middle School = \_\_\_\_\_ Adolescent/Young Adult = \_\_\_\_\_

2. How many faculty members are involved in the pre-service teacher preparation program at your institution?

Number of full time faculty = \_\_\_\_\_ Number of part time faculty = \_\_\_\_\_

3. How many faculty members involved in the pre-service teacher preparation program at your institution specialize in environmental education?

Number of full time faculty = \_\_\_\_\_ Number of part time faculty = \_\_\_\_\_

4. If a student at your institution expresses interest in teaching about the environment what specific course(s) does your institution recommend that s/he take?

5. Are any courses related to environmental education taught in departments or programs other than the pre-service teacher preparation program at your institution? (Circle one.)

No                      Yes                      Do not know

If yes, please describe each course including the name of the department/program in which it is taught. (You may provide a copy of the catalog description, a course flyer, etc.)

6. Considering all of the *pre-service teacher preparation* programs at your institution, what percentage of students in these programs is exposed in any way to environmental education? (Circle one.)

None      1-20%      21-40%      41-60%      61-80%      81-100%      Do not know

7. Please indicate if students in the pre-service teacher education program at your institution are required to take a **course in EE** at the following levels? If yes, please indicate the number of credits required in EE at each level and the department(s) in which the course(s) are taught.

	EE courses required? (Circle one.)	If yes, # of credits	If yes, department(s) where course(s) are taught
Early Childhood	No Yes		
Middle School	No Yes		
Adolescent/ Young Adult	No Yes		

8. Some teacher preparation programs require that their students have a knowledge base in environmental issues to teach EE. Please indicate if your institution prepares students in **environmental issues** at the following levels. If yes, indicate the number of credits required in environmental issues at each level and the department(s) in which the course(s) are taught .

	EE courses required? (Circle one.)	If yes, # of credits	If yes, department(s) where course(s) are taught
Early Childhood	No Yes		
Middle School	No Yes		
Adolescent/ Young Adult	No Yes		

9. Please indicate the number of students in your pre-service teacher preparation programs who are enrolled in a major, minor, concentration, or specialization in EE at each of the following levels.

	EE Major	EE Minor	EE Concentration	EE Specialization
Does this option exist? (Circle one.)	No Yes	No Yes	No Yes	No Yes
Early childhood	# = _____	# = _____	# = _____	# = _____
Middle school	# = _____	# = _____	# = _____	# = _____
Adolescent / Young Adult	# = _____	# = _____	# = _____	# = _____

10. Please circle the number that best reflects the extent to which you believe each of the following factors has served either as a barrier or a support to the development of environmental education components in your pre-service teacher preparation program. Factors that have posed the strongest barriers should be rated “1,” while those that have most encouraged the development of EE components should be rated “5.”

	Strong Barrier	Moderate Barrier	Neither	Moderate Support	Strong Support
a. Available course time . . . . .	1	2	3	4	5
b. Funding . . . . .	1	2	3	4	5
c. Faculty interest in EE . . . . .	1	2	3	4	5
d. Faculty knowledge of EE methods . . . . .	1	2	3	4	5
e. Faculty knowledge related to the environment and environmental issues . . . . .	1	2	3	4	5
f. Available faculty preparation time . . . . .	1	2	3	4	5
g. Access to substantive, up-to-date EE resources	1	2	3	4	5
h. Administrative support for EE . . . . .	1	2	3	4	5
i. Student interest in EE . . . . .	1	2	3	4	5
j. Institutional tradition . . . . .	1	2	3	4	5
k. Professional association guidelines and standards . . . . .	1	2	3	4	5
l. State certification guidelines . . . . .	1	2	3	4	5

m. Please list any other barriers or supports to the development of EE components in the pre-service teacher preparation program at your institution:

11. Please circle the number that best reflects your opinion of the effectiveness of your institution’s total pre-service teacher preparation program on the following factors.

	Not at all	Poor	Fair	Good	Excellent
a. Conveying environmental content knowledge . . . . .	1	2	3	4	5
b. Conveying instructional methods related to environmental education . . . . .	1	2	3	4	5
c. Educating about environmental issues . . . . .	1	2	3	4	5
d. Conveying environmental action strategies related to environmental education . . . . .	1	2	3	4	5
e. Environmental education overall . . . . .	1	2	3	4	5

12. As part of the National Project for Excellence in Environmental Education, the North American Association for Environmental Education (NAAEE) has produced **Guidelines for the Initial Preparation of Environmental Educators** (NAAEE, 2000). The six themes from these guidelines are listed in the table below.

a. Circle the number that best indicates the extent to which you are familiar with these guidelines.

Never heard of them	Somewhat familiar	Very familiar
1	2	3
		4
		5

b. Please indicate if students in the pre-service teacher preparation program at your institution are exposed to the skills and content areas represented by the guidelines. Mark an “x” in the appropriate cell if students are exposed to a particular guideline area at the early childhood, middle school, or adolescent/young adult levels.

	Early Childhood	Middle School	Adolescent/Young Adult	Do Not Know
<b>Environmental Literacy:</b> Educators must be competent in the skills and understandings associated with environmental literacy, including questioning and analysis skills, knowledge of environmental processes and systems, understanding and addressing environmental issues, and personal and civic responsibility.				
<b>Foundations of Environmental Education:</b> Educators must have a basic understanding of the goals, theory, practice, and history of the field of EE.				
<b>Professional Responsibilities of the Environmental Educator:</b> Educators must understand their responsibility to provide environmental education that is appropriate, constructive, and aligned with the standards in the field.				
<b>Planning and Implementing EE Programs:</b> Educators must combine the fundamentals of high quality education with the unique features of EE to design and implement effective instruction. Their pre-service preparation should enable them to provide the interdisciplinary, hands-on, investigative learning opportunities that are central to environmental education.				
<b>Fostering Learning:</b> Educators must enable learners to engage in open inquiry and investigations, especially when considering environmental issues that are controversial and require students to seriously reflect on their own and others’ perspectives.				
<b>Assessment and Evaluation:</b> Environmental educators must possess the knowledge, abilities, and commitment to make assessment and evaluation integral to instruction and programs.				

13. Please indicate if students in the pre-service teacher preparation programs at your institution are introduced to the following EE resources at the early childhood, middle school, or adolescent/young adult levels by placing an “x” in the appropriate boxes in the table below.

<b>Resource:</b>	<b>Early Childhood</b>	<b>Middle School</b>	<b>Adolescent/YoungAdult</b>	<b>Do Not Know</b>
Environmental Issues Forums				
Local or regional materials & resources – please list:				
Issue Investigation & Evaluation materials – please list:				
Nature Scope				
Project Learning Tree				
Project Wild				
Project Wet				
Food, Land, & People				
World Watch Institute publications				
Zero Population Growth publications				
State or Government publications – please list:				
Other – please list:				

14. Can students have a practicum, field experience, or internship in EE and receive credit in the pre-service teacher preparation program at your institution? (Circle one.)

No                      Yes            If yes, please describe the opportunities available in this area:

15. In the following table, indicate if students in the pre-service teacher preparation programs at your institution are taught the instructional methods related to EE shown in the left hand column at the early childhood, middle school, or adolescent/young adult levels. Mark an "x" in the appropriate cells.

<b>Method</b>	<b>Early Childhood</b>	<b>Middle School</b>	<b>Adolescent/Young Adult</b>	<b>Do Not Know</b>
Case studies				
Computer-oriented activities				
Cooperative learning				
Data acquisition & analysis				
Discovery				
Discussions				
Experiments				
Field trips				
Field research				
Inquiry				
Integrating across curriculum				
Issue investigations				
Learning styles				
Lectures				
Outdoor teaching strategies				
Problem solving/critical thinking				
Role playing & dramatization				
Self-directed learning				
Simulations				
Values analysis & clarification				
Other – please list				

16. Please indicate if your institution offers professional development in environmental education at the following levels. (Circle one.)

Undergraduate	No	Yes
Graduate	No	Yes
Continuing Education	No	Yes
Inservice	No	Yes

a) Please describe any inservice opportunities your institution offers in EE:

b) If inservice opportunities in EE are available at your institution, please provide contact information for the person(s) responsible for overseeing them.

17. Does your institution offer courses on a semester or quarter basis? (Circle one.)

Semester      Quarter

18. Would you like a summary of the results of this survey? (Circle one.)      No      Yes

19. Please provide the following contact information. We will only contact you if we need to obtain clarification on the answers you have provided in this questionnaire.

Name _____	Title _____
Work address _____	Work phone _____
_____	E-mail _____
_____	

20. Please share any comments you may have related to environmental education and your institution's pre-service teacher preparation program.

**THANK YOU for completing this questionnaire. Your input is very important and appreciated.**

Please return this survey using the enclosed envelope to  
Joyce Meredith, Project Director, Ohio EE 2000, P.O. Box 852, Hebron, Ohio, 43025.

## APPENDIX B

### Informal E-mail Survey of Non-Teacher Education Faculty in Ohio

Ohio EE 2000, a statewide environmental education (EE) initiative, is conducting a research project to assess the EE content in preservice teacher education in Ohio colleges and universities. We have already surveyed all teacher education departments in the state, but we are also interested in EE efforts which take place in academic departments OTHER THAN teacher education.

You have been identified by a colleague as someone who is active in providing environmental education content through your teaching or other professional activity. Could you please assist us with our research by responding briefly to the questions below?

The data collected through this project will provide highly valuable information on the status of EE in Ohio. Your help in this effort is greatly appreciated! Please feel free to contact me if you have questions related to this project, or to Ohio EE 2000.

Joyce Meredith  
Project Director

For the purposes of the following questions, we use the following broad **definition of EE**:

*The goal of environmental education is to help students become environmentally aware, knowledgeable, skilled, dedicated citizens who are committed to work, individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things.*

1. In what department(s) do you teach?
2. In what way(s) are you or your department involved with environmental education (EE)?
3. Please list or describe any environmental education courses provided through your department.
4. How did your or your department become involved with EE?
5. Does your department offer formalized ways for students to specifically prepare to be practicing environmental educators after graduation - i.e. a major, minor, concentration, or practicum, etc.?

6. Do you work cooperatively with the teacher education department at your institution in your EE efforts?
7. How many students per year (graduate and undergraduate) are involved with EE through your department?
8. Would you say the EE involvement in your department is growing, declining, or staying about the same? What do you think you are doing particularly well in this area? What would you like to be doing differently?
9. Do students involved in EE through your department intend to work as certified classroom teachers, or as nonformal educators in parks, zoos, nature centers, and other nonformal education situations? Or both?
10. Are you familiar with the North American Association for Environmental Education (NAAEE) guidelines for the initial preparation of environmental educators? If so, do you incorporate these guidelines into your EE efforts?
11. Do you know of other faculty members at your institution or at other Ohio institutions who are actively involved in EE? If so, can you provide their name(s), phone number(s), and e-mail address(es)?

Thank you for your time and effort in responding to these questions!

## APPENDIX C

### List of Responding Institutions

Antioch College  
Ashland University  
Baldwin-Wallace College  
Bowling Green State University  
Capital University  
Case Western Reserve University  
Cedarville University  
Central State University  
Cleveland State University  
Denison University  
Franciscan University of Steubenville  
Heidelberg University  
Hiram College  
John Carroll University  
Lake Erie College  
Lourdes College  
Marietta College  
Miami University  
College of Mount Saint Joseph  
Mount Vernon Nazarene College  
Muskingum College  
Notre Dame College  
Ohio Northern University  
Ohio University  
Ohio Wesleyan University  
Shawnee State University  
The University of Findlay  
University of Akron  
University of Cincinnati  
University of Dayton  
Ursuline College  
Walsh University  
Wilmington College  
Wittenberg University  
Wright State University  
Youngstown State University

Two unidentified respondents

## APPENDIX D

### Original Responses to Open-ended Survey Items

#### **Item 10. m. Please list any other barriers or supports to the development of EE components in the pre-service teacher preparation program at your institution.**

- The internal complexity that is involved in higher education in order to add programs.
- Lack of faculty/administrators to develop programs and teach courses - Biggest factor.
- There are so many required courses for teacher preparation it is hard to imagine others.
- Lack of awareness
- University requirements, state requirements for literacy
- The largest problem for teacher education is that EE is not a licensure category. We would be delighted and able to prepare teachers for EE in conjunction with our environmental studies program if such a licensure were available.
- Mostly it is a matter of hours available for them to take - we would add more if they had the time.
- So much to teach in methods classes and so little time to give all science areas proper coverage.
- Since it is not a state requirement, difficult to add more courses/staff/resources.
- Learned society requirements for early and middle childhood leave little time for additional courses. Students pursuing AYA licenses major in a discipline outside of education and must meet major requirements.
- Prerequisite of both biology and botany to take the EE course. EC people need one life science, but could not take EE because of the pre req.
- EE is not required in any of the state requirements for teacher certification/licensure. Job market for EE teachers not very clear.
- Available student time in a packed program
- Small institution and not able to offer too many areas of licensure.
- NCATE review
- Lack of overall interest and/or time. (There's one of me & EE is not in my faculty workload. Anything I do is unsupported.)
- Size of institution unable to support a specific program (as yet).

#### **13. Please list local or regional materials and resources to which students at your institution are exposed.**

##### Adolescent/Young Adult:

- Integrating EE & Science (methods students)
- EPA and EEC documents
- Life lab programs & materials (see attached).
- CVEEC, NASA-Glenn Center

- All that come across my desk or that I personally know about, especially Wild, Wet, PLT

**13. Please list Issue Investigation and Evaluation materials to which students at your institution are exposed.**

Adolescent/Young Adult:

- SEPUP
- especially Wild,Wet, PLT. Some others that I personally use.

**13. Please list state or government publications to which students at your institution are exposed.**

Early Childhood:

- Connections

Middle Childhood:

- Ohio Model Curricula
- Use of net for info

Adolescent/Young Adult:

- GLOBE program
- Ohio's model curricula, NSTA standards.
- Whatever comes to me

**13. Please list any other EE resources to which students at your institution are exposed.**

Adolescent/Young Adult:

- NIEHS grant-Project Excite on Environmental Health Science. 6 students participate w/ 6 interdisciplinary school teams.
- Lourdes College Life Lab supports Pre-service teacher prep, especially SCI 170 and SCI 370.

**14. Can students have a practicum, field experience, or internship in EE and receive credit in the pre-service teacher preparation program at your institution. If yes, please describe.**

- This would constitute a field experience in our Life Science, or probably any of our science licensure areas.
- Outdoor Ed Center at Glen Helen
- Part of student teaching can be done at the outdoor ed center at Glen Helen in Yellow Springs.
- The laboratory/field experiences for science methods courses include EE experiences. In addition, any student may complete a special independent study in EE for credit.
- Everything is done through school settings. A few students gain EE experience because of their placement with an EE disposed teacher
- Cincinnati Nature Center, Cincinnati Zoo
- Aullwood Audubon Center, Glen Helen Outdoor Education Center, other private OE/EE facilities, other parks, interpretive centers, zoos, self designed internships.

**15. List other instructional methods related to EE that are taught in the pre-service teacher preparation program at your institution.**

- Linking to Ohio proficiency outcomes, professional collaboration.

**16. Please describe any inservice opportunities your institution offers in EE.**

- Since I have background and experience in EE, I offer a variety of graduate level inquiry seminars ( a capstone experience for Masters level students) and teacher workshops in EE.
- Many
- Workshops for educators
- EDP 531 - Natural Science, Ecology & Education; EDP 533, Biomes Education.
- Workshops through EECO. WET, PLT, RW and Fostering a Sense of Wonder have been done recently.
- Professional development partnerships.

**20. Please share any comments you may have related to environmental education and your institution's teacher preparation program.**

- As you can see we don't do much in this area. I used to do an EE course in the summer, but due to enrollment we backed off.
- What exposition to EE is through a unit in the science methods course. The other exposition is through two core courses in the biology department/area.

- The largest problem for teacher education is that EE is not a licensure category. We would be delighted and able to prepare teachers for EE in conjunction with our environmental studies program if such a licensure were available.
- Would really like to host Project WET, WILD, or Learning Tree workshops here on campus for our students.
- The limited emphasis is due in part because of the minimal EE requirements within the state teacher licensure standards. How much more can be added?
- EE is not central to preparing teachers at elementary level. It is beginning to change now for middle childhood students due to a selected group of students (science, Social Studies concentrations).
- This survey was very hard to complete because we don't separate EE out from our required science methods courses. Certainly the environment is addressed in biology, global issues, & other content courses, as well as in methods courses. As a Quaker college, we promote action as well as knowledge, and our programs reflect our mission as "change agents" & activists for many causes, including the environment.
- I wish we could do more but with the new licensure programs just coming on there's no time or resources.