
Environmental Education and Extension: Making the Connection

Imagine you are playing “20 Questions.” Everyone in your office is taking turns asking your District Director questions about a new Extension education program. The conversation progresses something like this:

1. Does this education program involve working with a variety of audiences? Yes
2. Do the audiences include homeowners, land developers, farmers, business people, parents and the general public? Yes
3. Are there any adults who would not benefit from this program? No

You’re thinking that it sounds like this education program can happen with any adult. You’re wondering about kids so you shift the questions to youth education.

4. Does it involve working with kids in school? Yes
5. Does it only happen in schools? No
6. Does it provide youth and their parents with self-guided project manuals on conservation or environmental topics? Yes
7. Does it occur in 4-H clubs, conservation camps and summer programs? Yes
8. Is it nature study or conservation education? No, at least not exclusively.

Now you are wondering, if it can happen in school and out of school, who is working with the kids? So, you begin another angle of questioning.

9. Does it involve working with teachers? Yes
10. Do teachers attend workshops? Yes
11. Do teachers receive high quality resource materials about the environment? Yes
12. Is it environmental science or science education? No

You’re running out of questions! You need to start tying answers together and focusing them more.

13. Does it involve working with volunteers who then work with adults and youth? Yes

14. Do these volunteers, as well as Extension staff, address a wide variety of environmental topics and issues such as water quality, waste treatment, urban sprawl, solid waste and recycling, flood plain management, watershed protection, gardening, soil, habitat management, environmental shopping and indoor air pollution? Yes

Hum! That means it applies to all four program areas in Extension in an integrative approach. You continue to probe.

15. Is it based upon the most current research and best practices? Yes
16. Does it include using a variety of teaching strategies such as lecture, fact sheets, demonstrations, discussion, hands-on experience, role playing, case studies, issue analysis and problem solving? Yes
17. Does it include program activities such as individual projects, skill-a-thons, service projects, seminars, workshops, pond clinics and field days, one-on-one technical assistance, leadership development, team building, and conflict resolution? Yes
18. Does it help adults and youth make decisions about their role in the environment? Yes

Suddenly you know what it is. In your excitement you shout out:

19. Is it **environmental education**? Yes!

You smile. And with one question left! But then you say, “That’s not new! We’ve been doing some of these things for years. It’s just that we do not call them environmental education.”

In fact most Extension educators do environmental education programs routinely and may not call them environmental education. However, as Shakespeare wrote, “What’s in a name? That which

is called a rose by any other name would smell as sweet.” At times, however, staff think they are providing environmental education, but some critical element is missing. It may be just as sweet but but it is a carnation, not a rose. Others are providing great programs but they are not environmental education at all, not flowering plants yet equally worthwhile.

Characteristics of Environmental Education

Perceptions about environmental education vary throughout Extension. Just as beauty is in the eye of the beholder, environmental education is in the eye of the agent. As implied by the imaginary “20 Questions” game, there are common misconceptions and common characteristics about environmental education as outlined below. A deeper understanding of these can enhance and expand environmental education initiatives in Extension.

Conclusion

Environmental Education enhances Extension initiatives across all four program areas. At times it serves as the main focal point, as in helping a community to start a recycling program. At other times it enriches an existing program, as in teaching youth to crochet using scrap materials. The role of environmental education will increase as more and more specialists, agents, community leaders and volunteers understand what it is and how it can complement their programs.

Components	Common Misconceptions	Common Characteristics
Topic	*Based on educator’s perception of need	*Based on audience’s perception of need
Audience	Primarily youth and educators	All citizens including youth and adults
Purpose	Knowledge and skills about nature and/or the environment; advocacy	Informed decisions and responsible behavior related to the environment and environmental issues; balanced perspectives
Discipline	Science or environmental science	Interdisciplinary
Teaching Strategies	Information transfer, skill development	Wide range of teaching strategies
Location	In schools and nonformal education settings	Any appropriate site
Time (when during life)	During school years	Lifelong process as needs and issues emerge

* Nature and conservation

*Environment related

Environmental Education and Extension: Teaching and Learning in an Environmental Context

Education is the primary mission of Extension. Specialists, agents, community leaders and volunteers across the four program areas participate in this process. As they work at the state and local levels, when do people perceive these efforts as environmental education?

Education

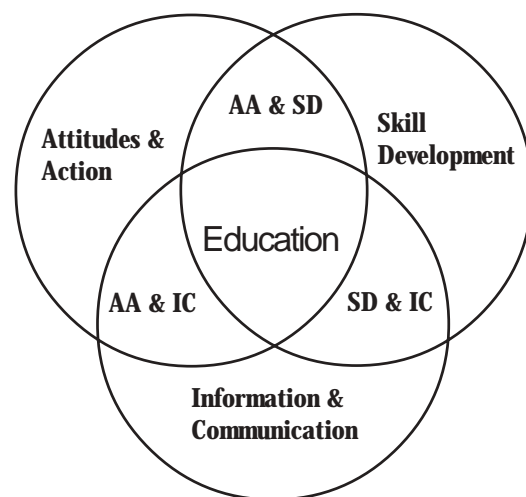
One way to approach this question is by examining the basic components of education: information and communication, skill development, attitudes and action. These three broad components are defined below.

- **Information and communication:** transferring knowledge and research findings to clients. This involves delivering general content, information updates, best management practices and results of research to people through a variety of delivery mechanisms (e.g., fact sheets, websites, reports, news releases, displays, presentations).
- **Skill Development:** becoming proficient in a broad range of skills through specialized instruction, modeling, practice and coaching. This may include skills in critical thinking, scientific processes, problem solving, decision making, communication, interpersonal relationships, teaching and research as well as specific psychomotor skills (e.g., operating equipment or tools, installing best management practices, using a dichotomous key, testing the pH of soil or water).
- **Attitudes and Action:** having the motivation and commitment to make informed decisions (supported by knowledge, skills and attitudes) that lead to responsible behaviors resulting in a sustainable environment and quality of life. This may involve personal as well as collective or community actions. In either situation, an individual's participation falls along a continuum that ranges from a relatively low-risk and personal level of involve-

ment (e.g., writing for information, recycling at home, inviting speakers to a group meeting) to a relatively high-risk and community level of involvement (e.g., speaking at a public hearing, starting a community recycling program, participating in a service learning project).

How these three components interrelate is determined by the program goal (see Figure 1). For example, if the goal is "information transfer," it may be met by mailing someone a written communication that contains only factual information. If the goal also includes "skill development," then the document would also need to describe how to perform the skill, and the reader would need to try out the skill. For a program goal to be "educational," all three components need to be explicitly present (i.e., the area where all three elements overlap). These three components together constitute the process of education, that is, a holistic approach to teaching and learning.

Figure 1
Education

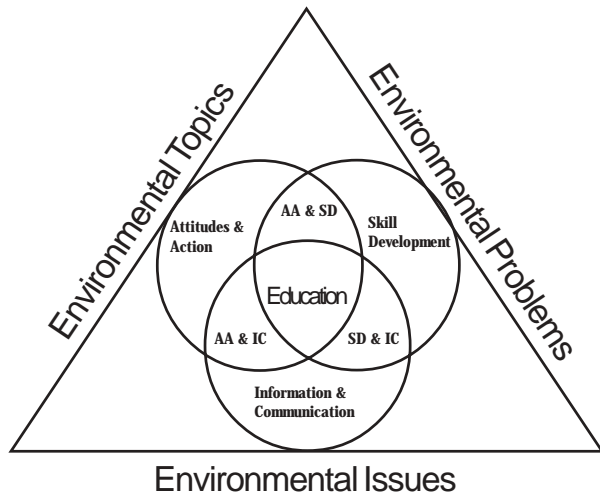


Environmental Education

Environmental education is grounded in this same educational process. What distinguishes it from general education is the focus on the natural and

socio-cultural environments. This includes environmental topics, problems and/or issues (see Figure 2).

Figure 2
Environmental Education



Environmental topics are any subjects that can be the focus of teaching and learning such as objects, organisms, systems, events, phenomena and processes.

Environmental problems are related to people, the environment, and the interaction between the two. As problems, they can and need to be fixed through a problem-solving process (e.g., gather information and data, analyze alternatives, act on a solution).

Environmental issues are *environmental problems* about which two or more parties cannot agree on how to fix them.

For example, flooding is an environmental topic. It is a process that occurs naturally in the environment. When a flood spills onto an undeveloped flood plain, it is usually not considered an environmental problem. If the flood plain is developed, the flooding can become a problem for those people affected if the floodwaters damage property or take human life. It can become an environmental issue if parties disagree about repairing the flood damage or stopping development in the flood plain in the future. Since environmental problems and issues are complex in nature, interdisciplinary approaches to problem solving and decision making are needed.

Formal Definitions of Environmental Education

The previous discussion describes the key components of environmental education; that is, the processes of education coupled with an environmental context. A review of environmental education definitions published over the last thirty years by different scholars and organizations illustrates how these key elements form a framework for defining environmental education. The bold print below highlights key words that correspond to the components and illustrate the consistency of the framework.

One of the earliest definitions was developed through a graduate seminar led by William Stapp (1969) at the University of Michigan. This definition states:

“Environmental education is aimed at producing a citizenry that is **knowledgeable** concerning the biophysical **environment** and its associated problems, aware of **how to solve these problems**, and **motivated to work** towards their solution.”

Roth (1969) expanded upon this definition in his dissertation that validated 112 concepts appropriate for environmental management education. In his view, environmental education is the process of developing a citizenry that is:

- **Knowledgeable** of the interrelated biophysical and socio-cultural **environments** of which [people are] a part;
- Aware of the associated environmental problems and management alternatives of use in **solving these problems**; and
- **Motivated to work** towards the maintenance and development of diverse environments that are optimum for living a **quality life**.

The integrity of these definitions has endured through time and is reflected in the definitions of international, national and state organizations. At the 1977 Intergovernmental Conference on Environmental Education organized by UNESCO and held in Tbilisi, USSR, the participants wrote the Tbilisi Declaration that stated:

The basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and built **environments** resulting from the interactions of their physical, biological, social, economic, and cultural aspects, and acquire the **knowledge, values, attitudes, and practical skills to participate** in a responsible and effective way in anticipating and **solving environmental problems**, and in the management of the **quality of the environment**.

(UNESCO, 1978)

This was followed two decades later by definitions from federal and state environmental protection agencies:

Environmental Education: A learning process that increases people's **knowledge and awareness** about the **environment** and associated challenges, **develops the necessary skills and expertise** to address these challenges, and **fosters attitudes, motivations, and commitments to make informed decisions and take responsible actions**.

(U.S. Environmental Protection Agency, 1996)

[Environmental education is the] learning process whereby people acquire an **awareness and scientific understanding** of the natural and built **environment**, cultivate **attitudes that value** the environment, and **develop skills** for identifying and addressing environmental issues. When effective, these lead to participation in environmental **decision making and actions** that result in a **sustainable environment, healthier people and livable communities**.

(Ohio Environmental Education Fund, 1998)

Most recently, the North American Association for Environmental Education (NAAEE) published environmental education guidelines for learning organized around four strands:

- **Knowledge** of Environmental Process and Systems
- **Questioning and Analysis Skills**

- **Skills for Understanding and Addressing Environmental Issues**
- **Personal and Civic Responsibility** (NAAEE, 1999)

These definitions and guidelines consistently demonstrate the overall scope of environmental education and its foundation in educational process.

Conclusion

OSU Extension strives to model a holistic approach to programming by addressing the three broad components of quality education. It in turn strives to model quality environmental education by addressing environmental topics, problems and issues as a primary or secondary element within its programs. Extension is committed to providing accurate and balanced information and helping individuals develop skills and attitudes to enable them to make informed decisions that lead to responsible behavior related to the environment and environmental issues.

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Environmental Education and Extension: It's Just Good Education

If proponents of educational reform were asked to critique quality environmental education practice, most would agree that it is synonymous with good education practice, both for youth and adults. While many comparisons can be made between environmental education and good education, three topics illustrate how environmental education adheres to principles of good education. Environmental education programs are designed to: 1) support how people learn best, 2) provide developmentally appropriate programs and resources for adult and youth audiences, and 3) teach people **how** to think, not what to think.

How People Learn Best

Concept Learning

In terms of learning concepts, Jerome Bruner described how people **of any age** learn concepts. Bruner states that, in order for concepts to be truly learned and understood, they must first be introduced to learners in a **concrete** way. That is, the concept must be developed by involving the learners with it through their senses, the use of manipulatives, hands-on activities, or other physical involvement. The experiential nature of environmental education provides this type of hands-on approach as it involves learners in their natural, built and social environments. For example, if a person, young or old, has never walked in a stream and collected macroinvertebrates, it is difficult for that individual to fully comprehend what these creatures are and why they are important. This is as true for a third grader in school as it is for a farmer planting crops next to a stream. After a learner has a concrete foundational understanding, the concept can be further developed in an **iconic** way; that is, through pictures, representations, or demonstrations such as field guides, dichotomous keys, and models. Only after the concept has been introduced concretely and developed iconically through second-hand approaches should it be reinforced through **abstract** learning such as written text, discussions or lecture.

Learning Styles

This sequence for learning concepts works well for people of all ages. In addition, individuals have **preferences on how they learn best**, or their learning style. In general, people favor one of four different ways of receiving and processing information. The first learning style can be called **friends**. These people want personal involvement and engagement with other people. They need to find personal meaning and daily relevancy in a topic. Time to reflect and express personal feelings, beliefs and opinions is necessary. They need to process “what I know” and answer the question “so what” during their learning experience. Presenters need to attend to their audience’s feelings. Teaching strategies that work well include using personal hooks, small group sharing, discussion, brainstorming, personal inventories, journaling, and hands-on activities (especially with new information and skills).

The **professors** represent the second learning style. They thrive on receiving new and accurate information, want to know what the experts know, and enjoy learning about and formulating theories. Efficient information transfer is preferred over time-consuming processing and discovering facts and data. They ask “what” and want presenters to engage them with facts. Teaching strategies that work well include lectures, audio-visuales, demonstrations, tours, textbooks, fact sheets and other printed and visual materials.

Next are the **scientists** who want to understand how things work and test what the experts say. They enjoy discovery activities and step-by-step investigations that involve them in hands-on learning. Their favorite question is “why,” so educators need to involve them in formulating ideas. Teaching strategies that work well include practicing skills, hands-on activities, decision making, problem solving, and field investigations.

Finally, the **inventors** connect things together, arrange information in new and different ways, improve upon what is already working to make it better, teach others, and take risks. In response to “what if” questions, educators need to encourage flights of fantasy. Teaching strategies that work well include sharing how they will use new information and skills, giving peer presentations, engaging in opportunities to make new applications, and developing action projects.

While people learn to some extent in all four categories, they have strong preferences for one over the others. Therefore, good education facilitates learning that moves from the concrete to abstract and honors individual differences in learning style. Since any group of people with whom Extension works includes all four learning styles, **it is critical to use a variety of teaching and learning strategies to better assure effective learning**. The strength of quality environmental education initiatives is the incorporation of these learning theories directly into programs and projects.

Age appropriate for Adults and Youth

While people share similarities in how they learn best, educators must address the developmental differences that exist among learners. Effective environmental education efforts are age appropriate, recognizing stages of development from young children to adults.

Adult Audiences

Adult learning theory offers specific suggestions on ways to work with adult audiences to meet their needs and fit their developmental stage. The following outlines some practical ways to work with adult audiences.

- Adults are self-directed and want others to see them that way. Therefore, targeted audiences or their representatives should be involved in planning, implementing and evaluating programs and products to assure that these efforts address their needs. This includes

objectives, content, teaching strategies, timing and/or schedules.

- Adults bring a lifetime of experiences and a wide range of familiarity with subject matter to the learning situation. Effort should be made to build on prior knowledge and experience, respect their views, use appropriate vocabulary and teaching strategies, draw upon learners as a resource, and provide opportunities for individualization.
- Adults are highly motivated to learn and want learning to be relevant, immediately applicable to their situation, and problem-centered. They need to see practical examples, participate in discussion, experience hands-on activities and field experiences, practice skills in real-life settings, and receive a useable product or skill.
- Adults need to be actively engaged in learning through interaction with each other (one-on-one and/or in groups) and through a variety of teaching and learning strategies.
- Adults respond well to programs and materials that are divided into logical segments, allowing them time and opportunity to assimilate chunks of information before moving on to new topics and ideas. They may lack confidence in their ability to learn and need opportunities for success and positive reinforcement.
- Adults need a learning environment that attends to their physical, emotional, social as well as intellectual needs. For example, this might include temperature, lighting and acoustic control, comfortable furniture, high quality and fun food, get-acquainted activities, humor and spontaneity, opportunity to make mistakes, free exchange of ideas with acceptance of differences, and opportunity to set own pace of learning and personal objectives.
- Adults, as they age, may experience more barriers to learning. These can be physical (e.g., need larger print, better acoustics) or intellectual (e.g., have to unlearn old information to assimilate new).

Youth Audiences

While some of these ideas may also apply to youth (e.g., need comfortable learning environment, need variety of teaching and learning strategies), children have different learning needs than adults. For example, they often do not see how they can immediately use what they have learned and they bring less experience to the learning situation. More importantly, children's learning is directly tied to their stages of development: physical, cognitive, social and emotional. For each of these areas, children progress through predictable patterns of growth that correlate to clearly defined age ranges. Depending on the need for specificity, child development materials describe very narrow ranges (e.g., 3 year olds, 9 to 10 year olds) or broader ranges (e.g., preschool, adolescent). The characteristics of each stage of development are widely accepted generalizations for an "average" child, recognizing that some individuals may develop ahead of or behind their age group.

Understanding these stages enables educators to design programs and services that are tailored to the general characteristics of any given age group. Knowing what to expect and identifying the educational implications is critical to successful programs. For example, five year olds are very active and have short attention spans. Educators should provide adequate opportunity for movement (both large and small motor skills) and frequently change activities or the pace of activities. They also have limited social skills and find "two" a crowd. On the other hand, adolescents can focus on one task for a longer period of time (although they also like change) and have a strong need for peer acceptance. Working in cooperative groups provides necessary and valuable social interaction and helps to build interpersonal relationship skills.

Before working with youth, it is important to understand their stage of development and tailor educational experiences accordingly. Child development books that describe different stages are readily available in libraries and bookstores. Chapter 7, "Youth Development," in the *Ohio 4-H Program Agent's Handbook* provides an outline of the physical, emotional, cognitive and social stages

of development of youth from 6-19 years of age and provides guidance for working with them in learning situations.

Whether working with youth or adults, knowing the audience and how people learn is basic to any teaching and learning situation. One of the strengths of environmental education is that it models how programs and materials can be carefully designed to meet specific audience needs.

Education versus Advocacy

A concern that sometimes arises is that people often blur the lines between environmental education and environmental advocacy; yet, there is a distinct difference between the two. Many educators are familiar with the expression, "Teach people how to think, not what to think." This concept is critical to understanding what is meant by "good" education. The focus for teaching and learning is placed more on process rather than product. For example, individuals are encouraged to:

- Analyze environmental issues,
- Identify the stakeholders,
- Examine attitudes, values and beliefs that support different perspectives,
- Consider strengths and weaknesses of alternatives,
- Choose an informed course of action, and
- Follow through with their personal behaviors.

This process, which teaches people "how to think," differs significantly from advocacy where individuals promote a specific perspective and course of action, or "what to think."

Extension's mission is clearly aligned with education, not advocacy. Programs and materials present current research findings, well-documented facts, and a balanced presentation of differing viewpoints to enable citizens, young and old, to make informed decisions and take responsible actions.

Enhancing Environmental Education in Extension

In summary, environmental education already has a presence in Extension because of the topics and issues addressed by agents and their demonstration of sound educational practice. As with any arena, opportunities for improvement abound. Agents can make relatively minor modifications in programs and materials that elevate the environmental education dimension and enrich the learning experience. For example, an agent doing a program on how to shop economically and nutritionally can easily incorporate information on shopping packaging, genetic engineering and pesticides. 4-H clubs can add an environmental action component by participating in a “green” community service project such as planting a hummingbird garden at a nursing home or starting a storm drain stenciling program in their neighborhood. Agents can broaden their pond clinics and field days by not only lecturing on key topics but also providing participants with the opportunity to try out new skills and design action plans to take home. On issues of community development, agents can assure that current, factual information is available and that diverse perspectives are honored and considered during decision making.

Enhancing environmental education in Extension enhances Extension and its capacity to deliver quality education to the citizens of Ohio. For more program ideas, see “Enhancing Your Extension Program with Environmental Education.”

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Environmental Education and Extension: Turning Missed Opportunities into Golden Education Programs

“My plate is already full!” is a lament that many Extension educators feel they live daily. Agents seldom identify a shortage of new ideas for programs and projects as a concern. Client needs abound, as do strategies for meeting these needs. The idea of integrating environmental education into the current workload may be viewed as one more thing to do or as a golden opportunity. In many situations, environmental education methods and resources provide a way to do what you are already doing but doing it more effectively.

Think about your existing programs and/or consider a newly developed one you are preparing to implement. Based upon the ideas presented in “Environmental Education and Extension,” check for missed opportunities by answering the following questions:

1. Is there an environmental topic, problem or issue that you could address? Would including it enhance the program and further meet client needs? To what extent should you address the environment-related topic?
2. If you choose to include an environmental topic, problem or issue, is your approach going to be environmental education or environmental advocacy?
3. Are your program goals comprehensive? Do they include information and communication, skill development, and/or attitudes and action? If one component is missing, should it be included?
4. Are you meeting the individual learning needs of your audience? Do you provide the opportunity for people to engage in the way they learn best? Do you address their developmental needs?

Based upon your answers to these questions, determine if you have missed an opportunity and how to change it into a golden program. This transformation can be as simple or as complex as is appropriate considering client needs, time, available resources and personnel.

The following outlines different approaches for incorporating environmental education into existing programs and/or developing new programs. How you incorporate environmental education can be described using two continua.

Scale



Small Scale

Large Scale

Scale refers to several criteria such as time, resources, and personnel that determine whether an initiative is viewed as small or large in scope. For example, a small-scale effort may address an identified need, take very little time to prepare or implement, and require no new materials, resources or staff. On the other hand, a large-scale initiative may meet several needs, take a substantial amount of time to develop and implement, and use considerable resources and personnel. Perceptions of what constitutes small, medium or large scale may differ from one person to another, and, therefore, is difficult to operationally define. The more critical concept is that varying degrees of implementation exist, each having strengths and weaknesses. Selecting the most appropriate scale, based on your time, resources and personnel, is important.

Development



No Development

Full Development

Development refers to how much preparation is necessary to incorporate environmental education into a program, project or other initiative. For example, you may already have or can easily locate a ready-to-use resource that requires no modification to meet your needs. You can use the resource without changes by adding it on or including it in your existing program. Another approach is to incorporate environmental education by substantively adapting an existing program – one devel-

oped by you or someone else. This may involve modifying part of something or substituting another resource that you change to meet your needs. Finally, you can design an environmental education program for a specific audience and need.

The following matrix gives examples of different approaches to incorporating environmental education into Extension based on these two continua.

Incorporating Environmental Education in Extension: Different Approaches

Scale → Development ↓	1) Small Scale	2) Medium Scale	3) Large Scale
a) Incorporate Ready-to-Use Programs	1a) Find an existing EE resource that enhances a current program by adding it on or including it in what you are already doing (e.g., take 3-5 minutes to read a news article on a related environmental topic or issue; engage learners in a 5-minute hands-on activity)	2a) Similar to “1a” but takes more time and/or resources and may replace a part of what you were doing (e.g., build a personal action component into a program and follow-up to see results)	3a) Replace a current or implement a new program by using resources that have already been developed (e.g., <i>Give Water a Hand, Master Watershed Steward</i> training program)
b) Adapt Existing Programs	1b) Find an existing EE resource that you can adapt to enhance a current program by adding it on or including it in what you are already doing (e.g., modify a K-12 hands-on activity to use with adults)	2b) Similar to “1b” but takes more time and/or resources and may replace a part of what you were doing (e.g., model a significant portion of your program on another successful program using, for example, part of its implementation strategies or materials format)	3b) Completely model a program after another program (e.g., adapt <i>Give Water a Hand</i> to <i>Give Forests a Hand</i>)
c) Develop New Programs	1c) Develop your own EE resource that enhances a current program by adding it on or including in what you are already doing (e.g., develop your own list of examples of how people can shop in an environmentally friendly way as they shop economically and nutritionally)	2c) Similar to “1c” but takes more time and/or resources and may replace a part of what you were doing (e.g., redesign a significant portion of your pond clinic to include more effective teaching strategies)	3c) Add to your repertoire a totally new program which you or your team design, pilot test and implement (e.g., develop a series of fact sheets and consumer workshops on an environmental topic or issue related to your client’s needs)

How you incorporate environmental education into your Extension programs will vary depending on the nature of your program. You may simply add a few comments on how your topic relates to an environmental issue or you may develop a completely new program. Or you may

choose an approach somewhere between these such as redesigning a favorite program. The following illustrates one way to transform a traditional pond management clinic into one that reflects more of an environmental education approach:

Transforming an Existing Program: Pond Management Clinic

Planning Components	As Currently Conducted	Transformed Using an Environmental Education Approach
Topic	Pond Management	Pondering Your Pond
Audience	Adults, plus a few children that accompany their parents	Adults – for immediate application Youth for high school environmental classes or clubs Teachers for subject matter update
Purpose	To teach pond owners how to manage their pond to achieve desired uses.	To teach pond owners about aquatic ecosystem processes To instruct participants on how to evaluate management options based on natural processes To discover the environmental consequences of various choices
Teaching Strategies	Lecture – information transfer	Lecture Sharing experiences Inquiry Problem solving Peer teaching Discussion Questioning
Location	Sitting/standing at a place on the pond bank; in a room with a slide show or PowerPoint presentation.	Moving around the pond site and stopping at various locations to explore and discuss topics and applications to real situations (e.g., farm, retention pond in urban development)
Time Considerations	2 hours	3 hours, in order to provide enough time for participants to engage and discover

Conclusions

OSU Extension currently uses environmental education as an integrative approach to teaching and learning across the four program areas. “Environmental Education and Extension” illustrates why this is important and supports on-going efforts.

In addition it encourages Extension educators to examine their own practices to determine how they might enhance their existing programs and initiate new ones that incorporate environmental education.