THE DEVELOPMENT, PILOT, AND EVALUATION OF AN ON-LINE COURSE TITLED *NRES 410/610 TEACHING ABOUT THE ENVIRONMENT OUTDOORS*

by

Karla Lucile Lockman

A Thesis
Submitted in partial fulfillment of the
requirements for the degree

MASTER OF SCIENCE
NATURAL RESOURCES
ENVIRONMENTAL EDUCATION AND INTERPRETATION

College of Natural Resources
UNIVERSITY OF WISCONSIN
Stevens Point, Wisconsin

December 2006

ABSTRACT

Wisconsin teachers are required to teach concepts of environmental education in the K-12 curriculum. However, many teachers are hesitant to bring their students outdoors for anything except P.E. and recess, despite the growing research that shows the outdoors is good for children's health, emotional and mental well-being. Their reluctances come from a lack of teacher training in outdoor environmental education practices and techniques.

NRES 410/610 Teaching About the Environment Outdoors (TAEO) is a one-credit, on-line course developed for UW-Stevens Point and the Wisconsin Center for Environmental Education. The goal of this course is to increase participants' knowledge, skills, and confidence when teaching about the environment in the outdoors.

The aim of this research study was to develop, pilot and evaluate *TAEO*. Development of the course was completed by the researcher with help from various text, online, and personal resources. The pilot ran from July 30-August 26, 2006 with ten K-12 licensed teachers participating. A pretest-posttest evaluation showed that all participants gained knowledge of outdoor environmental education topics as a result of taking the course. Through a series of formative assessments containing both Likert-scale and open-ended questions, the researcher determined the revisions that should be made to the course. Finally, the researcher used open-ended comments on the summative evaluation to determine that TAEO was perceived as a valuable learning tool by participants.

ACKNOWLEDGMENTS

First, thank you to my graduate advisor, Dr. Randy Champeau. Your time, expertise and dedication to my project was incredible. You have helped me along every step of the way, even through the organizational disasters early on. Thank you also for giving me the amazing opportunity to teach at CWES. Through that experience, I learned so much more than just EE programming.

Thank you to my graduate committee. Dr. Dennis Yockers, you always knew the resources I needed, and most of the time, you had them on your bookshelf. Thank you for a wonderful and educational trip to Puerto Rico as part of the GET Teacher Exchange. I learned so much about EE in the classroom and was truly inspired by both the Puerto Rican and Wisconsin teachers' enthusiasm for learning. Dr. Leslie Wilson, I've learned more from you during your courses than any other Professor at the University. Your inspiration has helped me to become a better teacher. I won't ever forget the story of the red flower with the green stem.

Thank you to all the amazing people that helped to make *TAEO* a successful course. Tim Byers, Angela Lemar, and Sheila Bannister-Gross, I thank you for your enthusiastic support and help with the promotion and registration of the course. Denise Deering and Josh Steinke, I thank you for your fabulous training in "webmaster-ing." Susan Ermer and the GET program for helping with the funding of *TAEO* and for the amazing Puerto Rico trip! Thank you Carol Wake for being a liaison between Randy and me and for always taking extra time to be so friendly.

To the Central Wisconsin Environmental Station-what an amazing experience! Bobbi & Becca, thank you so much for taking me on as your graduate assistant. It was a pleasure learning from you. Scott and Tom, thank you for the encouragement, experience, and for keeping traditions alive at CWES. Thank you to all the graduate students I had the pleasure of working beside: Emily, Kate, Clarke, Gwen, Becky and Abbie. To the rest of the staff, thanks for making it so memorable and for the yummy CWES cookies!

Thank you so much to my Mom and Dad. You are the best parents in the whole world and I can't thank you enough for all the support and love you have given me. Katie and Kerry Jo, you are the greatest sisters! I thank you for all the encouragement and laughs you give me so very often. I've needed you all so much these past three years and couldn't have made it through without you!

Bryan, I am so thankful to God that you are in my life. You have supported me and my education every step of the way. You are the most dedicated husband anyone could ask for and I'm overwhelmingly in love with you. Thank you for your love, friendship, strength, and understanding. To my furry pals Dakota, Jack & Bucky, you always bring a friendly woof, meow, or purr to me just when I need it most. Thanks!

TABLE OF CONTENTS

CHAPTER THREE - METHODS

CHAPTER FOUR – RESULTS

CHAPTER FIVE - DISCUSSION OF RESULTS

LIST OF APPENDICES

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

INTRODUCTION

I. Introduction to Study

The purpose of this research study is to develop, pilot, and evaluate an online course on outdoor environmental education teaching methods for the University of Wisconsin-Stevens Point (UWSP). The online course is titled *NRES 410/610 Teaching About the Environment Outdoors (TAEO).*

Why an online course? Since December of 2001, UWSP College of Natural Resources (CNR) has offered distance-learning courses to both undergraduate and graduate students. Currently, there are 20 online courses offered by the Wisconsin Center for Environmental Education

(WCEE). Distance learning courses are offered over the internet because of advantages such as increased diversity in participants' demographics, asynchronous communication, increased instructor and learner interaction, and the ability to utilize a variety of learning modalities (Kerka 1997). Zbleski (2001) recommends "that the CNR continue to develop and market online courses" because courses on "natural resource topics are not readily available in online format and there are instructors that are interested in this type of pedagogy."

Why outdoor environmental education? "There is no more highly stimulating setting than the outdoor classroom. This classroom is equipped with expandable walls that extend as far as the learners' legs want to carry them" (Hammerman et al 1985). The outdoor environment provides an abundance of visual, auditory and physical stimuli that can help students with various learning styles learn best. The need for teacher training in the field of outdoor environmental education was found by Simmons in 1998 who determined that teachers lacked confidence in their knowledge of the environment and taking students outdoors. A course on methodology and techniques for teaching in the outdoors is needed to reach educators in an attempt to achieve the following: increase their knowledge of outdoor teaching techniques & strategies, improve group management skills, practice teaching outdoors using multiple learning styles, and increase their overall confidence with outdoor environmental education.

II. Sponsors

The development of this course is sponsored by the Wisconsin Center for Environmental Education (WCEE), Global Environmental Management (GEM), and Global Environmental

Teachings (GET). Created in 1990 by the Wisconsin State Legislature, the WCEE's mission is "to collaborate and develop partnerships with agencies and organizations, and institutions on the development, implementation, evaluation and recognition of environmental education programs" (WCEE 2003). GET is a program of the WCEE with a mission "to connect K-12 educators and students worldwide through environmental/conservation education" (GET 2004). These organizations along with the support of GEM, aided in the development of this and other online courses to accomplish their mission in creating a web of environmental/conservation educated people all over the world.

III. Aim of Study

The aim of this study is to develop, pilot, and evaluate the one-credit UWSP online course *NRES 410/610 Teaching About the Environment Outdoors (TAEO).*

IV. Goals of Study

1. To develop a one-credit online course titled *NRES 410/610 Teaching About the Environment Outdoors*.
2. To pilot *NRES 410/610 Teaching About the Environment Outdoors* for K-12 educators in UWSP's Extended Master's Program for graduate credit.
3. To evaluate *NRES 410/610 Teaching About the Environment Outdoors* to determine if participants increased their level of knowledge and confidence with teaching outdoor environmental education, gather information on what revisions that should be made to the course, and assess whether *TAEO* is perceived as a valuable learning tool.

V. Objectives of Study

1. Develop an online course according to the following objectives:

   1a. Identify course goals and objectives and develop course content and assignments

   1b. Design course homepage and D2L site

   1c. Obtain feedback from graduate committee and course approval from appropriate UWSP and CNR committees

2. Pilot the online course according to the following objectives:

   2a. Promote course to licensed K-12 teachers currently in the Extended Master's Program, Extended Master's perspective students, and graduates of the Extended Master's Program

   2b. Select applicants to participate in the experimental pilot course

   2c. Offer the one-month online course *NRES 410/610 Teaching About the Environment Outdoors* for one credit in Summer 2006

3. Evaluate the online course according to the following objectives:

   3a. Measure statistical difference in knowledge obtained after having taken the course by administering a pretest-posttest

   3b. Determine revisions to *NRES 410/610 Teaching About the Environment Outdoors* by evaluating course content, structure, design and technology

   3c. Assess the overall value of *NRES 410/610 Teaching About the Environment Outdoors* as a learning tool

VI. The Null Hypothesis

H_0: There is no increase in perceived knowledge regarding topics & techniques for outdoor environmental education after having completed *NRES 410/610 Teaching About the Environment Outdoors.*

VII. The Limitations

1. The applicants were K-12 teachers interested in the Extended Masters Program in Environmental Education at UWSP. Participants selected from the applicant pool were graduates, current students, or prospective students of the Program. Therefore, the results can only be generalized to K-12 teachers already having an interest in environmental education and looking to take an online course on outdoor environmental education.
2. The number of participants in the piloted course was limited to 10 students.
3. Participant responses to questions on the pretest-posttest evaluation rate a perceived level of knowledge and may not be an accurate reflection of actual knowledge of topics.

VIII. The Assumptions

1. There is a need for an online course on the methodologies and techniques in teaching in the outdoors.
2. Those enrolled in the course and participating in required readings, assignments, and evaluation surveys are the registered people they claim to be.

3. Participants have the required technology for the online course and it will be available to them on a weekly basis.
4. The evaluation will be used by the WCEE to determine the future offering of *TAEO*.

IX. Definition of Terms

Distance Education – Formal, institutionally-based, educational activities in which learner and educator are physically separated from each other, and interact through mediated technologies (Williams, et al 1999)

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 the challenges, and fosters attitudes, motivations, and commitments to make informed decisions and take responsible action (UNESCO, Tbilisi Declaration 1977)

Desire2Learn (D2L) – A secured internet platform used by participant to access secured information with username and password (D2L 2004)

Hyperlink – A selectable connection from one word, picture, or information object to another. In a multimedia environment such as the World Wide Web, the most common form of link is a highlighted word or picture that can be selected by the user resulting in the immediate delivery and view of another file (Wilcox 2004)

One-credit – Traditionally 800 minutes (13 hours and 20 minutes of contact time with a student.)

On-line Course – A course where all or most of the content is delivered on-line and there are typically no face-to-face meetings (Mattano 2005)

Undergraduate – The level at which individuals are in pursuit of a first or bachelor's degree from an accredited university (Zbleski 2001)

X. Abbreviations

ADHD – Attention Deficit Hyperactivity Disorder

AEE – Association for Experiential Education

CNR – College of Natural Resources

D2L – Desire 2 Learn

EE – Environmental Education

GEM – Global Environmental Management

GET – Global Environmental Teachings

IT – Information Technology

KEEP – Wisconsin K-12 Energy Education Program

OEE – Outdoor Environmental Education Program

TAEO – NRES:610 Teaching About the Environment Outdoors

URL – Uniformed Resource Locator

UWSP – University of Wisconsin-Stevens Point

WAEE – Wisconsin Association for Environmental Educators

WCEE – Wisconsin Center for Environmental Education

WWW – World Wide Web

CHAPTER TWO

THE REVIEW OF RELATED LITERATURE

I. Introduction to Related Literature

An online course on outdoor teaching methods sounds like going on a four week road trip but never setting foot outside of the car. "Many educators understand, through personal observation and experience, the enormous value EE holds in student learning" (Wilcox 2004). Outdoor Education is that component that involves hands-on, get-your-feet-wet, sound experiences that accelerates a student's vehicle for learning and his or her drive to know more. Bringing information on environmental education teaching methods and techniques to teachers and nonformal educators across the nation has shown to be successful through distance education courses offered by UWSP (Wilcox 2004). By offering an interactive, asynchronous online course on teaching methods in the outdoors, learners will have the opportunity to expand their knowledge on outdoor education and increase their skills in outdoor programming.

II. The Evolution of the Outdoor Education

The definition of Outdoor Education has changed focus and goals many times since the 1920's when the term was first introduced by theorists L.B. Sharp and Julian Smith. Outdoor education stemmed primarily from nature study, a movement in the early 1900's that encouraged the observation and documentation of natural occurrences. "Nature study and outdoor education forced an appreciation of the multiplicity of factors that the classroom tended to isolate" (Disinger 1983). In 1943, Sharp became an advocate for outdoor education and focused on camping education. In this early stage of outdoor education, instructors taught survival skills such as shelter building, fire building, outdoor cooking and so forth. Shortly thereafter, in 1955, Smith created the National Outdoor Education Project. With the

creation of this initiative, outdoor education had matured to and gained support from public schools and communities (Adkins & Simmons 2003).

There are many different ways to learn in the outdoors. Conservationists might perceive outdoor education as the management and education of natural resources. Those who use the outdoors for recreation may take outdoor education to mean an aesthetic enrichment or improving outdoor skills. Those advocating for environmentalism might be concerned with giving citizens the necessary skills to take action against environmental degradation (Hammerman et al 1985). People with a wide range of experiences and backgrounds view the outdoors from different perspectives. Likewise, because outdoor instruction can vary in purpose and scope, a specific definition for outdoor education may be impractical.

Donaldson and Donaldson (1958) first defined outdoor education as "education in, about, and for the outdoors." By examining this definition, one can determine that outdoor education can occur "in" any outdoor setting from a school yard, swamp, industrial park, meadow, desert, zoo, state or national park, rainforest, etc. "These kinds of locations are conducive to first-hand experiences, to direct contact with the topic, and to participant interaction and socialization" (Ford 1986).

"'About' explains that the topic is the outdoors itself and the cultural aspects related to the natural environment" (Ford 1986). L.B. Sharp (1943) captures this part of the definition in his statement "That which can best be taught inside the schoolrooms should there be taught,

and that which can best be learned through experience dealing directly with the native materials and life situations outside the school should there be learned" (Sharp 1943).

Disinger (1983) gives consideration to Sharp's statement with his definition of outdoor education, "Outdoor education is an educational method or approach that uses resources outside the classroom for education purposes" (paraphrased: Disinger 1983). In this definition, Disinger echoes Sharp suggesting that if an instructor is teaching material that is found in the classroom, it should be taught inside. If the subject matter is outdoors, the classes should be taught outdoors. "Immersing students in an outdoor experience helps them to understand textual abstractions… [and] can help to bridge the gap between theory and practice" (Crimmel 2003).

Thirdly, in Donaldson's definition, the purpose of outdoor education is "for" the outdoors. "'For' tells us that the purpose of outdoor education is related to implementing the … domains of learning for the sake of the ecosystem itself. It means understanding, using, and appreciating the natural resources for their perpetuation" (Ford 1986). This definition may imply that outdoor education strives to create environmentally literate, cognizant, and sympathetic citizens who might ideally take up a lifestyle that will preserve or better the environment. Some critics, however, state that this definition is too specific and doesn't take into account some types of recreation or curriculums.

Another widely accepted and broader definition of outdoor education came from Hammerman et al. (1985). They defined outdoor education simply as "education that takes

place in the outdoors." Hammerman understood that people used the outdoors in many different ways to achieve educational objectives. This definition implies that any matter of subject, literary or skill, if taught outside the classroom walls, is outdoor education. In this description, "outdoor education became more general to accommodate a wide variety of programs" (Adkins & Simmons 2003).

Dr. John Passmore of University of Toronto organized and directed the first outdoor education conference in 1967 at Geneva Park, Canada. He suggests that Outdoor Education can:

- "Offer meaningful learning situations which should be an important part of every child's education,
- Provide an opportunity for direct learning experiences,
- Stimulate students' curiosity and permit them to discover the excitement and satisfaction of learning out-of-doors,
- Enable pupils to develop new interests and skills, and
- Give them a much broader knowledge of ecological principles and their relationship to our quality of life" (Passmore 1972).

Howe, et al (1988) supports Passmore's findings by stating, "Out-of-school environmental education experiences account for a significant amount of what most people know about the environment, their attitudes and values toward the environment, their knowledge of environmental issues, and their knowledge of environmental actions."

The common thread in this variety of accepted definitions *is* an outdoor experience. Whether the goal is camping ethics, observing animal adaptations, or learning about weather, if it involves the students in an outdoor setting, it is outdoor education.

Richard Louv's 2005 book Last Child in the Woods: Saving our Children from Nature-Deficit Disorder is an eye-opening account of how the children of the millennia are no longer spending quality time in green spaces. Video games, movies, I-pods and other electronics are gripping children in an "electrical outlet mentality." Louv coined the term nature-deficit disorder. Although it is not a medically diagnosed illness, Louv claims that "based on accumulating scientific evidence… the concept – or hypothesis – of nature-deficit disorder is appropriate and useful as a layperson's description of one factor that may aggravate attentional difficulties for many children." More on this subject can be found later in this chapter.

III. Examining Disciplines related to Outdoor Education

There are three disciplines that have goals and methods of reaching those goals similar to outdoor education. Environmental education (EE) encourages learners to move from awareness to citizen action and participation in environmental issues. Experiential education (ExpEd) focuses its efforts on giving a learner a hands-on learning experience and making the experience concrete by reflecting upon their findings and generalizing to other experiences. Outdoor education, environmental education, and experiential education are often overlapped by educators (Adkins & Simmons 2003). Interpretation is also included in this literature review because it greatly utilizes the outdoors as subject matter and a tool for

creating inspiration and awe in their audience. Interpretation strives to inform an audience in an enjoyable and memorable way that is not overwhelming in facts and figures, yet seeks to connect the learners to a place or natural finding (Regnier, K. et al. 1992). Each discipline is further reviewed.

A. Environmental Education (EE)

The United Nations Educational, Scientific, and Cultural Organization (UNESCO) organized the Belgrade Working Conference on Environmental Education in 1975 and the Tbilisi Intergovernmental Conference on Environmental Education in 1977 (Tbilisi, Georgia USSR). Out of these world-wide conferences stemmed a definition and five goals for EE.

The Wisconsin Department of Public Instruction (WDPI) used the goals of the Tbilisi Declaration to define EE and the EE goals for the statewide curriculum.

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 (WDPI 1994).

The goals of EE as stated by the Tbilisi Declaration 1977 include:

1. Awareness – to help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems

2. Knowledge – to help individuals and social groups gain a variety of experiences with the total environment and to acquire a basic understanding of the environment, its associated problems and humanity's critical responsible presence and role in it
3. Attitudes – to help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement
4. Skills – to help individuals and social groups acquire the skills for working toward the solution for environmental problems and to foster a dialogue between these groups
5. Participation – to help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to help solve these problems and avoid future problems (Tbilisi 1977).

Wisconsin is fortunate to have State Academic Standards for EE that require teachers to infuse EE into their curriculum (or write their own curriculum) to assure their students reach certain benchmarks of knowledge and skills. For the past six years, UWSP has been offering online courses to teachers for professional development. Courses such as Biodiversity and Conservation, Fundamentals of EE, and Island Biogeography have been found to help educators in their professional development while getting their Masters at UWSP and in their classroom. Many of these courses help teachers infuse environmental topics and issues into their curriculum and encourage their students to become aware, gain knowledge, develop values, learn skills and act to help protect and preserve the environment. Although EE can take place outdoors and certainly has the goal of helping the environment, Hungerford (1975) warns against mislabeling outdoor education as environmental education. He writes "to deal

with the two fields as synonyms does serious injustice to both. Outdoor education… goes far beyond the domain of environmental education."

B. Experiential Education

Experiential learning can be defined simply as "learning by doing or experience" (Ford 1987). Although John Dewey first introduced the concept of learning by experience in the mid-1930's, it wasn't until 1977 with the establishment of the Association for Experiential Education (AEE) that experiential learning emerged as a recognized field of education (Hammerman et al 2001).

The AEE defines experiential education as, "a process through which a learner constructs knowledge, skill, and value from direct experiences" (Adkins & Simmons 2003). However, the experiential learning cycle only begins with an experience. Knapp (1992) states that throughout the duration of a learning experience, the participant becomes aware of different stimuli and information by way of their five senses. Once the learner mentally processes the occurrence, he or she is ready to discuss it with other individuals having a similar experience. Only upon reflection and discussion of the experience is the learner able to make judgments and conclusions. The experience is not considered concrete until it is reflected upon. The final step in experiential learning is to encourage the learner to generalize his or her findings to other occurrences or predict the turnout of a similar experience. The learner has now engaged in a concrete experience. Figure 2.1 is an adaptation of Kolb's model of the experiential learning process.

Figure 2.1 An Experiential Learning Model (adapted from Kolb 1984)

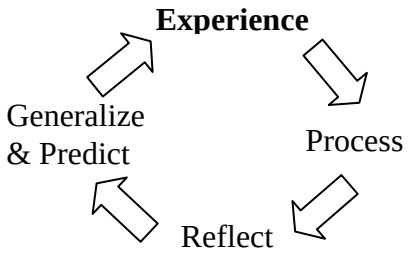


Figure 2.1 indicates that generalizing and predicting subsequently leads to another experience. The model must then assume that a learner will pursue another experience based on its anticipated outcome and/or the concept that conscious humans are experiencing something at any given moment.

C. Interpretation

Enos Mills is considered the founder of interpretation. During the early 1900's, he led nature hikes into the Rocky Mountains. Not only was he an enthusiastic nature guide, but he analyzed the techniques he used to interpret. Before his death, "he developed principles, guidelines, and the techniques which laid the foundation for modern interpretation" (Regnier et al. 1992). It wasn't until 1957 that Freeman Tilden's book *Interpreting Our Heritage* defined the profession of interpretation. Tilden laid out six principles of interpretation that interpreters at all levels adhere to today. Regnier et al (1992) states that the two broad goals for interpretation are (1) Interpret the site and (2) Involve the visitor.

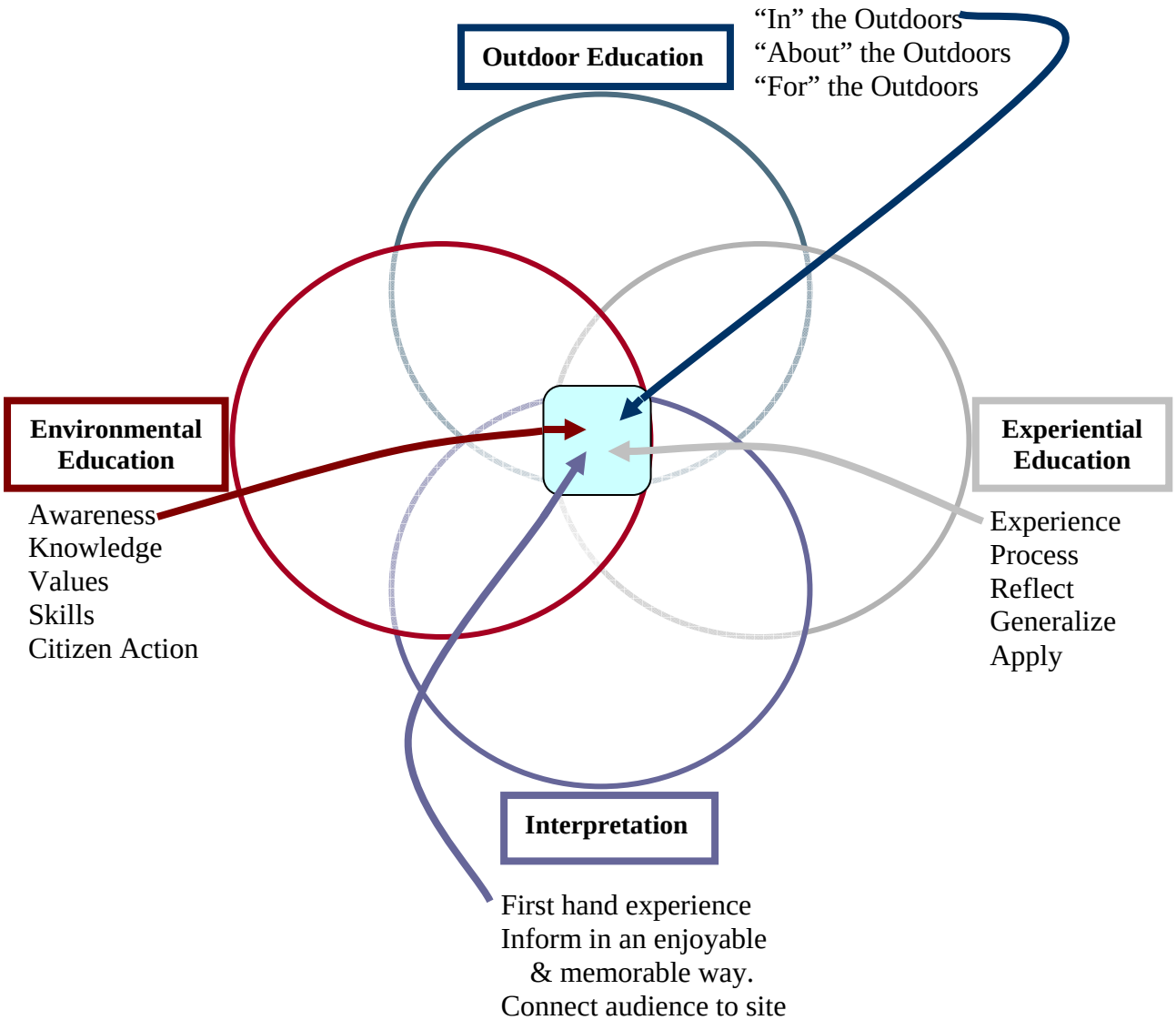
Interpreting the site is often done by drawing the connection between something an audience is familiar with, to the concept or phenomena the interpreter is trying to convey. Comparing an oak tree to a 7 story building, or an acre to a football field are just two examples. Involving the audience can be achieved in many different ways. Audience members are engaged in first-hand experiences when they are asked to answer questions, participate in a game, see, hear, taste, touch, and smell the site, role play, become inspired and curious. Tilden (1957) defines interpretation as "an educational activity which aims to reveal meanings and relationships through the use of original objects, by firsthand experience, and by illustrative media, rather than simply to communicate factual information." Along with offering audiences the chance to experience something firsthand, interpretation strives to inform audiences by making those experiences enjoyable and memorable. (Regnier et al. 1992)

IV. Commonalities among OE, EE, ExpEd, and Interpretation

Upon examining the definitions and goals of outdoor education, environmental education, experiential education, and interpretation, the one feature that stands as common ground among them all is providing learners with a first-hand experience (Figure 2.2). Whether the student is indoors studying a ground water model in a High School environmental class or outdoors taking measurements of the ground water level and watershed around their school, they are involved in a hands-on learning experience. "Instructional approaches that involve activity and direct experiences with natural phenomena have become collectively known as *hands-on science*, which we have defined as any educational experience that actively involves students in manipulating objects. Unfortunately, the use of hands-on activities is far

less frequent than lecture and discussion" (Haury et al. 1994). Most American schools offer traditional instruction in science, with relatively few schools tailoring curricula for a hands-on approach (Howe et al. 1990).

Figure 2.2 Commonalities Among OE, Exp Ed, EE, & Interpretation
(Lockman 2006)



Outdoor education, environmental education, experiential education, and interpretation are mediums for hands-on learning. The major difference is that outdoor education *must* take place outdoors using outdoor objects as the focus for the lesson. The outdoors provides physical stimuli ideal for a hands-on experience. A positive outdoor experience has the potential to help learners become aware and more knowledgeable of their natural surroundings.

V. Benefits to Learning in the Outdoors

"Not only is being outdoors pleasant, its richness and novelty stimulate brain development and function. Cognition is rooted in perception the outdoors is a prime source of perceptions" (Rivkin 2000). By using all five senses, students can't help but become aware of their surroundings.

A. Learning Modalities

The ways in which learners receive and retain information are termed learning modalities. "Learning modalities refer to the style learners use to concentrate on, process, and retain information" (Hutinger 2001). Learning modalities include learning by seeing or visual, learning by hearing or audible, and learning by doing or kinesthetic. Many learners utilize a combination of all three.

Visual learners learn best through observing visual stimuli through their sense of sight. Learners prefer to read, silently observe, and look at illustrations or pictures, and or watch a demonstration rather than listening to directions. Visual learners often make lists and can be

extremely organized and neat. Ways in which visual learners learn best are illustrative displays including pictures, charts, diagrams, videos, demonstrations, guided imagery, and highlighting (Learning Curve 2004).

Auditory learners learn best through observing audible stimuli through their sense of hearing. Learners prefer to be active in listening activities, group discussions, read out loud or be read to, listen to the radio while working or reading, and tend to have an outgoing personality. Ways in which auditory learners learn best are oral instructions, lectures, repetition, rhythmic sounds, poems, group discussions and audio/visual equipment (Learning Curve 2004).

Kinesthetic learners learn best through observing physical stimuli through their sense of touch. Learners prefer to be extremely hands-on orientated, to use hand gestures when talking, enjoy problem solving activities, and manipulate tangible objects. Ways in which kinesthetic learners learn best include experiments, investigative activities, games, field trips, making lists, and role-play (Learning Curve 2004).

Richard Felder in his 1996 article *Learning Matters* gives, "some strategies… that appeal to a range of learning styles:"

- *Teach theoretical material by first presenting phenomena and problems that relate to the theory*. Don't jump directly into in-depth concepts before first showing the student some type of connection with the real world. Describe examples associated with the theory, and perhaps give the students some problems and see how far they can go before they get all the tools for solving them.
- *Balance conceptual information with concrete information*. Begin with something familiar to the student or something tangible that students can visually, audibly, or physically observe, and work towards abstractness.

- *Make extensive use of sketches, plots, schematics, vector diagrams, computer graphics, and physical demonstrations in addition to oral and written explanations and derivations in lectures and readings.* Showing, speaking, and demonstrating information helps students to remember and process the content in the way in which each student learns best.

(Paraphrased from Felder 1996)

The outdoors provides many visual, audible, and physical stimuli. By exploring these things using physical senses, students will receive and retain information in the manner in which they learn best.

B. Multiple Intelligences

"The theory of multiple intelligences was developed in 1983 by Dr. Howard Gardner, professor of education at Harvard University. It suggests that the traditional notion of intelligence, based on I.Q. testing, is far too limited. Instead, Dr. Gardner proposes eight different intelligences to account for a broader range of human potential in children and adults" (Armstrong 2006).

These intelligences are:

- Linguistic intelligence - word smart
- Logical-mathematical intelligence - number/reasoning smart
- Spatial intelligence - picture smart
- Bodily-Kinesthetic intelligence - body smart
- Musical intelligence - music smart
- Interpersonal intelligence - people smart

- Intrapersonal intelligence - self smart
- Naturalist intelligence - nature smart

The outdoors is a great location to ask students to showcase their unique combination of intelligences. For example, a child with the naturalist intelligence excels at “sensing patterns in and making connections to elements in nature” (Wilson 1998). This child may know the name of every bird that flies overhead, or be looking under logs for salamanders. Her classmate, on the other hand, may be journaling quietly, sketching his observations of the morning dew on a leaf.

“Developing the naturalist intelligence is no different than teaching math or reading skills. Teachers must provide the opportunity for this intelligence to grow” (Meyer 1998). However, many teachers have reservations about teaching science and a phobia of taking their class outdoors. A course on environmental topics, teaching strategies, and conducting activities could help many teachers find the confidence they need to take the first step to positive outdoor learning. By varying assignments and classroom activities, such as with outdoor excursions, students who typically struggle in a classroom atmosphere can thrive and show that they are indeed “successful” or “intelligent” at something.

C. Decreased Behavioral Problems

Research found that kids having trouble in school with both behavior and grades actually benefit from getting outside. Since the integration of an outdoor education program, a number of students with behavior disorders improved their self-concept, social behavior,

academic effort and group cohesion (Lappin 1984). Reasons for these results include a refocus of energy, and exposure to variety of stimuli and learning activities that deviate from the traditional in-class lecture.

Not only does the outdoors provide great learning opportunities, it also offers emotional wellbeing. Unlike some aspects of the traditional classroom that inhibit the emotional growth, exposure to the outdoors encourages creativity in students and a break from the day-to-day norm of classroom school. The change in environment can facilitate learning by removing behavior-disordered students from the classroom setting which they may already identify with failure (Lappin 1984). Most education programs are not primarily designed for this reason. Instead, programs are designed to enhance outdoor or athletic skills. Programs that are designed specifically to enhance emotional growth are typically carefully planned with specific, measurable objectives (Berman & Davis-Berman 1995).

Richard Louv (2005) documents several cases where parents observe changes in their children when they are exposed to more time outdoors. He writes, “My son is still on Ritalin, but he’s so much calmer in the outdoors that we’re seriously considering moving to the mountains.” Louv also reports on the research of Nancy Wells. “In 2000, Wells conducted a study that found that being close to nature, in general, helps to boost a child’s attention span. When children’s cognitive functioning was compared before and after they moved from poor- to better-quality housing adjacent to natural, green spaces, ‘profound differences emerged in their attention capacities even when the effects of the improved housing were taken into account.’”

Andrea Faber Taylor, Frances Kuo, and William Sullivan are researchers with the University of Illinois and have conducted research on the effect of green spaces on children diagnosed with Attention Deficit Hyperactivity Disorder (ADHD). Taylor, Kuo, and Sullivan, "have found that green outdoor spaces foster creative play, improve children's access to positive adult interaction – and relieve the symptoms of attention-deficit disorders" Louv (2005). A study these researchers published in *Environment and Behavior* compared symptoms of attention-deficit of children who participated in outdoor "green" activities, to those who remained primarily indoors. "They found that greenery in a child's everyday environment… specifically reduces attention-deficit symptoms… Green settings were far more likely to leave ADD children better able to focus, concentrate" (Louv 2005).

VI. Barriers to Teaching Outdoors

A study by Simmons (1998) found that reasons teachers didn't bring their students on outdoor field trips included a lack of confidence with environmental and ecological concepts, and group management including student safety.

Simmons found that when teachers were asked what the benefits were to teaching in the outdoors, "For many teachers, the benefits are clear. Providing students direct contact with nature is good education and an essential part of the curriculum." However, many of the teachers she surveyed were apprehensive to bring their class into an outdoor setting because, "the teachers' level of confidence and sense of being well prepared to teach EE" was lacking (Simmons 1998).

Another finding from the 1998 study was that teachers have a great concern about student safety and their ability to manage a large group of students in an environment where the only boundaries are roads. Many days, the only time students get to go outside is at recess. Recess can be "defined as a break period, typically outdoors, for children. Compared to the rest of the school day, recess is a time when children have more freedom to choose what they want to do and with whom" (Jarrett 2003). Teachers have concerns with their ability to focus students' attention and energy, and create an environment conducive to learning.

VII. Online Teacher Training

Teachers in most states are not required to get formal training in environmental education, outdoor education, or environmental studies (McKeown-Ice 2000). The Environmental Education Training and Partnership (EETAP 2004) understands there is a lack of EE programming. In May 2004, EETAP claimed that a "lack of EE faculty and EE certification requirements" were to blame. "Additionally, teachers have reported a lack of confidence in their pre-service training for developing knowledge and skill in affective educations methods and environmental action strategies" (EETAP 2004). A study done in 1995 by Lane et al, showed that Wisconsin teachers after having attended a workshop or otherwise hands-on learning opportunity, were more likely to infuse those activities in their own classrooms. Teachers who had no training or have only read the activities were less likely to infuse the activities into their current curriculum.

In response to this study, Wisconsin, among other states, has developed EE training programs for teachers and nonformal educators for professional development, graduate credit,

certification, and non-credit options. Educators can't afford to "spend countless hours in professional development activities," so Barnett (2003) suggests "designing your professional development activities in a way that ensures that teachers' time and your investment in time and money pay off in increased student achievement. Distance learning has the advantage of allowing teachers to access professional development at a time and location convenient for them" (Barnett 2003). UWSP College of Natural Resources and the Wisconsin Center for Environmental Education offers online courses anyone can take to get a sound foundation in, or expand their knowledge about environmental education or natural resources.

Online courses provided by the University give educators the flexibility of working on assignments and required readings at their own pace, and in the comfort of their home or school. UWSP online courses have been very successful in giving educators additional training in natural resources. The first online course was developed by Bobbi Zbleski Kubish in 2000 on biodiversity and conservation education. Six years later, UWSP's CNR in cooperation with UW-Extension, offer over twenty online courses to participants located all over the country.

VIII. Overview of Distance Education

"Online learning is the future of education" (Canning-Wilson 2000). Because of Distance Education's "anyone, anywhere, anytime" feature, learners can take part in asynchronous class discussions from work or home at a time convenient for him or her. "Experts predict that over the next few decades that over 50% of student populations will be educated using

on-line learning and/or technology" (Canning-Wilson 2000). "The terms "distance education" or "distance learning" have been applied interchangeably by many different researchers to a great variety of programs, providers, audiences, and media" and will therefore be used interchangeably throughout this document (Sherry 1996).

A. Advantages and Disadvantages of Distance Learning

Several research studies show that cognitive learning can be done *better* on the internet than in a traditional lecture (Draves 2000). Draves provides his Top 10 Reasons for why he feels this is true.

> "Number 10: You can learn at your own peak learning time of day.
> Number 9. You can learn at your own speed.
> Number 8. You can learn faster.
> Number 7. You can interact more with the teacher.
> Number 6. There is more discussion online.
> Number 5. Participants come from around the world.
> Number 4. You can learn from the foremost authorities and experts.
> Number 3. Online learning is less expensive and thus more accessible.
> Number 2. Internet links provide more resources.
> Number 1. You can form a virtual community."

Other studies support Draves's claim. For example, a 1997 article by Sandra Kerka stated seven advantages to distance learning on the World Wide Web, many of which echo Draves's reasons.

"Advantages of delivering distance learning on the Internet include the following

1. Time and place flexibility;
2. Potential to reach a global audience;
3. No concern about compatibility of computer equipment and operating systems;
4. Quick development time, compared to videos and CD-ROMs;
5. Easy updating of content, as well as archival capabilities;
6. Usually lower development and operating costs, compared to satellite broadcasting, for example;

7. Can enhance interactivity between instructors and learners and among learners, which is a serious limitation of some distance learning formats."

Kerka (1997) also examines some of the disadvantages to distance learning on the World Wide Web.

"As with any medium, there are disadvantages.

1. At present, limited bandwidth (the capacity of the communications links) and slow modems hamper the delivery of sound, video, and graphics, although the technology is improving all the time
2. Reliance on learner initiative can be a drawback for those who prefer more structure
3. Learner success also depends on technical skills in computer operation and Internet navigation, as well as the ability to cope with technical difficulties
4. Information overload is also an issue; the volume of e-mail messages to read, reflect on, and respond to can be overwhelming, and the proliferation of databases and websites demands information management skills
5. Access to the Internet is still a problem for some rural areas and people with disabilities."

Distance Education deviates from synchronous face-to-face interaction in many ways. Face-to-face lectures require all students to be present at the same place, at the same time. The delivery method of information is primarily oral although thanks to digital visual presenters and PowerPoint, there are visual representations. Distance education allows a student to complete the assigned course material and correlating assessment over the course of a week, or all in one day according to their own personal schedule. The delivery method is primarily written information, but may be supplemented with photographs, videos, and sound bites.

In a face-to-face lecture, the lecturer is the expert on topic and teaches the principles of the topic to a listening audience. Distance education is very much learner-based. Instead the instructor, who does the organization of the class, takes a back-seat to student discussion and learning. The instructor thus becomes the facilitator in adult online education.

There are three types of interaction necessary for successful distance education:

1. Learner-content interaction
2. Learner-instructor interaction
3. Learner-learner interaction (Smith, G et al. 2001)

Some researchers have criticized distance education stating that it alienates the student from the instructor and learners from one another. However, a study was done with the State Universities of New York with 21 teachers who had both taught face-to-face and distance format. The data was collected through Likert scale email surveys, open ended telephone and email surveys. Researchers found that there are a number of educational opportunities, advantages over traditional classes, and easily accessible and integrated informational resources. One drawback researchers found was with information on the internet being fake or phony. When doing the project or report, students need to know how to look for information (Smith, G et al. 2001).

Online learner motivation and dropout rates were examined by Carr in 2000. Carr noted “that dropout rates are often 10 to 20 percentage points higher in distance education courses than in traditional courses.” Reasons leading to this statistic may include the learner being disconnected with the content, instructor, or other learners. He or she may feel disconnected or alienated from the class or not motivated to do the work. Research provides evidence that strong feelings of community may not only increase persistence in courses, but may also increase the flow of information among all learners, availability of support, commitment to

group goals, cooperation among members, and satisfaction with group efforts (Carr 2000). A community of learners may be any group that has similar learning interests or sharing similar experiences. Regardless of the size of the group, the online learning environment must nurture the concept of community (Rovai 2002).

B. The Online Learning Modalities

In the past, distance courses were primarily lectures channeled through audio tapes, cable television or via a VHS tape. Another tool was to simply assign readings and at the end of each reading right a short essay. Today, with the help of Discussion Boards and Chat Rooms, Quicktime and Media Player, online educators have the ability to reach learners of all types of learning modalities.

For the visual learner, online courses can offer 3-D pictures and topographical maps. There is still a fair amount of reading; however, there are pictures and video clips to reduce ambiguousness of words. For the auditory learner, there are sound bites and video clips. There are ways for the kinesthetic learner to do hands-on learning such as completing an assignment out in their own community or interviewing a co-worker or a friend who takes a specific action to benefit of the environment (Johnson 2000).

Johnson, after reviewing literature, contends “that powerful online learning environments need to contain a combination of these principles: (1) address individual differences, (2) motivate the student [and allow for individual locus of control], (3) avoid information overload, (4) create a real-life context, (5) encourage social interaction, (6) provide hands-on activities, and (7) encourage student reflection .”

IX. Considerations for the Development and Implementation of an Online Course

In 1997 McGreal advised that all online courses include the basic components and webpages listed here:

1. Homepage (following these will be a short description)
2. Introduction to instructor
3. Course overview, goals, and learner objectives
4. Course requirements
5. Outline of instructor and student expectations
6. Resources
7. Glossary
8. Discussion area (D2L) where class memos and assignments (and responses) will be posted.
9. FAQ – frequently asked questions document that the students can refer to themselves, or that the instructor can cut and past from when answering questions.

McGreal advises considering the following questions before developing an online course.

1. Which computer system are you using for the server?
2. What kind of software will you be using for the server? For development? For students?
3. What degree of security is required? Who can access how much? What controls are needed?
4. How innovative do you want to be?
5. How much does the instructor wish to control the development of the course?
6. How much can be spent to develop the course?
7. How much control will students have?
8. How much preparation time do you have before the course starts?
9. Who is your target audience and what are their needs?

X. Evaluation Strategies

The evaluation of an online course can happen in several ways. To ascertain if there was a perceived increase in participant knowledge after having taken the online course, a pretest-posttest design is suitable. To assess the quality of the course including content, structure, design and technology, formative evaluation surveys would be suitable. A summative evaluation in the form of a follow-up survey could be utilized to evaluate overall value of

course. “This diagnostic use of assessment to provide feedback to teachers and students over the course of instruction is called *formative assessment*. It stands in contrast to *summative assessment*, which generally takes place after a period of instruction and requires making a judgment about the learning that has occurred” (Boston 2002).

A. Pretest-Posttest Design

The Pretest-Posttest design is an example of a Quasi-Experimental research design (Gribbons 1999). Because the experimental group was selected according to some criteria, there are threats to external validity. Randomly selected groups have a greater degree of representation in the sample as compared to the greater population. However, one of the limitations of this study is that the results are only generalizable to those already having some interest in environmental education and looking to further their education. A two-tailed t-test is often used in pretest-posttest designs to statistically determine the difference between two means using means and standard deviations.

B. Formative Evaluation

“Assessments become formative when the information is used to adapt teaching and learning, to meet student needs” (Boston 2002). By administering short assessments throughout the duration of the experiment, the collected data is fresh and uncompromised by future events or time. The information can be used to update or revise the experiment already in progress. This feedback is valuable because it makes the instructor or learner “aware of any gaps that exist between their desired goal and their current knowledge, understanding, or skill” (Boston 2002).

One type of formative evaluation includes an interval continuum chart such as a Likert Scale. A Likert Scale asks participants to rate how they feel about a statement on a range of possible choices.

An example of a Likert Scale question would include:

Bringing students outdoors is important to me.

1 (strongly disagree) – 2 (disagree) – 3 (neutral) – 4 (agree) – 5 (strongly agree)

The participant would then determine to what degree he or she agreed or disagreed with the statement and to what degree.

Other formative evaluations consist of one or more open-ended questions. Chances are, a participant will not be able to express all of their feelings through the Likert Scale format. Open-ended questions give participants the opportunity to go into detail about their comments or suggestions. Examples of open-ended questions include:

- *What do you suggest the course instructor change about the content in Unit 1?*
- *What material did you find most valuable when considering the content of Unit 1?*

C. Summative Evaluation

The summative evaluation provides information on how efficient the experiment is and if the actual outcomes were similar to what was intended. “Summative evaluation is conducted upon course completion and is used to determine the overall effectiveness of the class or instructional product. Summative evaluation usually focuses on student performance, course relevancy, learner attitudes towards the delivery methods used, and the instructor's teaching style and effectiveness” (Willis 1992).

Two ways to evaluate an online course upon its completion are follow-up questionnaires and telephone interviews. Follow-up questions can be quantitative using Likert Scale type questions or open-ended. Both types of questions, give the researcher valuable information about the overall success of the course. Examples of questions are as follows:

#1. I would recommend taking this online course to a colleague or friend.

1 (strongly disagree) – 2 (disagree) – 3 (neutral) – 4 (agree) – 5 (strongly agree)

#2. Do you plan to use the information you have gained throughout the course in your classroom?

1 (strongly disagree) – 2 (disagree) – 3 (neutral) – 4 (agree) – 5 (strongly agree)

#3. If so, how do you plan to use the information you have gained throughout the course in your classroom? Please explain.

CHAPTER THREE

METHODS

I. The Online Course Development

- **A. Course Goals, Objectives, Content and Assignments**
- **B. Course Homepage and D2L Site**
- **C. Committee Feedback and Course Approval**

II. The Online Course Pilot

- **A. Promoting Course**
- **B. Selecting Applicants**
- **C. Piloting *NRES 410/610 Teaching About the Environment Outdoors***

III. The Online Course Evaluation

- **A. Pretest-Posttest**
- **B. Course Revisions**
- **C. Course Value**

The aim of this research was to develop, pilot, and evaluate the online course titled *NRES 410/610 Teaching About the Environment Outdoors (TAEO).* The content and webpage design was created by the researcher with assistance from her advisor, committee members and UWSP staff. The pilot course was offered Summer of 2006 to ten K-12 teachers and nonformal educators who were graduates, current students, or prospective students in UWSP's Extended Master's program. The course was evaluated using a Pretest-Posttest, formative and summative evaluation surveys.

I. The Online Course Development

The online course was inspired by the director of the Wisconsin Center for Environmental Education (WCEE), Dr. Randy Champeau. Dr. Champeau received funding from the Global Environmental Management (GEM) for the development of this course in April 2004. The following objectives guided the course development:

1a. Identify course goals and objectives and develop course content and assignments

1b. Design course homepage and D2L site

1c. Obtain feedback from graduate committee and course approval from appropriate UWSP and CNR committees

Timeline:

Spring 2004
The WCEE Director along with other members of WCEE discussed idea of an online course on teaching methods in the outdoors.

September 2004
Development of the aim, goals and objectives for the development, pilot, and evaluation of an online course on teaching methods and techniques in the outdoors.

October 2004-December 2004
Research of related literature and research methods

December 2004
Project approval by graduate committee

January-March 2006
Meeting with UWSP IT Web Designer
Course development and review

April-May 2006
First round review of course by committee members
Course design finished by UWSP IT Web Designer

May-June 2006
Revise course
Market to K-12 and nonformal educators as graduates, current students, and perspective students in the Extended Masters Program.

July-August 2006
Pilot *NRES 410/610: Teaching About the Environment Outdoors*
Collect data

September-November 2006
Compile and assess data
Make conclusions

November-December 2006
Make revisions to course

A. Course Goals, Objectives, Content and Assignments

The goal of *TAEO* is to increase participants' knowledge and confidence with teaching environmental topics outdoors. Participants were given the opportunity to use the practical assignments, helpful and engaging readings, along with authentic experience, to accomplish this goal. Goals and objectives specific to each of the four units were developed in November 2004, modified in February 2006 and again in April 2006.

The framework for the four-unit course was created in February 2006 by the researcher after reviewing a variety of text and online references on techniques and methods for teaching in the outdoors in addition to meeting with her advisor. For a complete list of resources, refer to Appendix A. Course content was selected from various online resources, quoted texts, and actual experiences. The units progressed from a broad introduction to outdoor education and effective pedagogy, to requiring participants to examine a specific technique and practice that technique. Participants also worked to identify online and community educational resources.

Three types of assignments were used in each of the four units to evaluate learners' perceived increase in knowledge and skills when teaching about the environment in the outdoors. The assignments were called Head Outside, Reading Reflection, and Online Discussion.

B. Course Homepage and D2L Site

The course design template for *TAEO* was constructed by a UWSP IT Web Designer along with a work study student. The Web Designer used Dreamweaver software to create the design template. The researcher met with the Web Designer on a number of occasions for help and instruction with website design and maintenance. Microsoft Frontpage software was exclusively used by the researcher to create additional introductory and unit pages, and insert the course content.

The design and technology of the *TAEO* course website is similar to other courses offered by UWSP in the College of Natural Resources. Similar elements include the UWSP logo and title in the header, link to the secured webpage Desire2Learn, and footer links to the UWSP homepage (http://www.uwsp.edu), Wisconsin Center for Environmental Education homepage (http://www.uwsp.edu/CNR/wcee/index.htm), Extended Masters in EE Program homepage (http://www.uwsp.edu/natres/msnree/), the Wisconsin Center for Environmental Education telephone number (715-346-4973), and a Contact Us link to the researchers email (klockman@uwsp.edu).

The course webpage consisted of the following components:

1. Course Home – Provides general information including description, credit, intended audience, evaluations regarding the research of this thesis, and justification for the course using a quote from Richard Louv's book Last Child in the Woods: Saving our Children from Nature-Deficit Disorder
2. Goals and Objectives – Contains course goals and unit objectives
3. Course Syllabus – Gives a general outline of units and learning topics with links to each unit, unit assignments, and grading scale and assignment rubrics
4. Assignments – Explains the three types of assignments, gives details on the fourth unit assignment, and provides links to all assignments, grading scale and rubrics
5. Instructor Info – Contains instructor's background information and teaching philosophy
6. Computer Requirements – Provides basic recommendations for computer needs to take an online course, access readings and complete assignments
7. Links – Includes all referenced materials and links that contributed toward the content or found within the course *TAEO*

All photos used for *TAEO* were taken by the researcher and compressed or modified by a UWSP IT work study student. The instructor was responsible for editing and evaluating the course content on a bi-weekly basis to monitor links and remove those that were not working immediately. The instructor was also responsible for grading assignments, communicating with students, and answering any questions.

Desire2Learn (D2L) is a secured web page that UWSP (and other Wisconsin Colleges) use for many online & face-to-face college classes. The D2L page for *NRES 410/610: Teaching About the Environment Outdoors* was managed by the researcher with the advice and suggestions from the UWSP Information Technology and D2L specialist for UWSP. All student personal information such as assignments, grades, student information, and surveys were password protected in D2L.

The D2L Course Home (Appendix B) was used by the researcher to post news, additional information or answer frequently asked questions. Students had access to the course homepage (http://www.uwsp.edu/natres/nres610taeo/index.html) and each week-long unit through the Content link. Students could view classmates' student information and tell whether they were currently online by clicking on Classlist. Students had the opportunity to instant message or page classmates to chat. Students could view only their own progress and grade in the course by clicking on Grades. The instructor updated grades weekly and gave feedback on assignments. The Grades page was set up into the four units with each of the three assignments under each unit.

The three assignments for each unit were submitted in D2L. The Discussion board was used for the Online Discussion assignment. Participants posted a reply to a prompted question or statement with personal thoughts, reflections, or experiences. Participants are also required to reply to at least one other classmate's response. Online and distance learning has been criticized for a lack of instructor-student and student-student interaction. The discussion board allowed the participants to carry on a dialogue of theory, exchange of ideas, and the

sharing of stories at a time that was convenient to them. This type of asynchronous communication has been shown to be a strong tool for online learning.

Reading Reflection and Head Outside assignments were also submitted to D2L. These assignments however, were uploaded into the Dropbox. Contents of the dropbox are only visible to each participant, not to the entire class. The instructor was able to view the time and date each assignment was submitted and give feedback.

C. Committee Feedback and Course Approval

The first draft of *TAEO* was submitted to the researcher's committee members Dr. Randy Champeau, Dr. Dennis Yockers, and Dr. Leslie Owen Wilson on March 27th, 2006. After meeting with each committee member regarding suggestions for revision, the researcher made adjustments based on their recommendations and resubmitted to her major advisor.

All research at UWSP that is done with human subjects is required to complete an online tutorial and submit an application to the Internal Review Board (IRB). The IRB application form, Letter of Consent, and evaluation tools (formative evaluations, summative evaluations, and pretest-posttests) were submitted to Dr. Sandra Holmes, chair of the IRB on May 4th, 2006.

II. The Online Course Pilot

UWSP offered the pilot of *NRES 410/610: Teaching About the Environment Outdoors* July 30th – August 28th 2006. The following objectives were accomplished in doing so:

2a. Promote course to K-12 and nonformal teachers currently in the Extended Master's Program, Extended Master's perspective students, and graduates of the Extended Master's Program

2b. Select applicants to participate in the experimental pilot course

2c. Offer the one-month online course *NRES 410/610 Teaching About the Environment Outdoors* for one credit in Summer 2006.

A. Promoting the Course

The four-week online course was promoted through the WCEE and the UW-Extension to perspective, current and completed graduate students of the Extended Masters in Environmental Education Program. Because the WCEE has been working to give teacher professional development credits in EE for nearly 15 years, it seemed logical to continue marketing to the audience already identified by WCEE.

TAEO was able to offer an incentive to attract teachers to take this course during the summer months. The researcher was able to waive the fee of one-graduate credit (Approximately $300) per participant with funds from Global Environmental Teaching (GET), a program of the WCEE and UWSP's Global Environmental Management (GEM) Program. This funding was authorized in exchange for participants' assistance in evaluating *TAEO* according to the researcher's evaluation objectives.

B. Selecting Applicants

Upon advice from committee members and WCEE staff, the researcher chose ten participants according to their previous background in EE. Those with more experience with UWSP online courses and knowledge of environmental education would be beneficial in evaluating this course and giving suggestions for revision and change.

An initial email notifying participants that they were accepted to take the pilot course was sent on June 30th, 2006 (Appendix C). After the selected participants replied to the email confirming their acceptance, they were registered by the UWSP Continuing Education Specialist.

C. Piloting *NRES 410/610: Teaching About the Environment Outdoors*

The *TAEO* Course Packet was sent out to participants July 14th, 2006. It included the course schedule and timeline, website links, information on D2L, information on the Unit 4 assignment, IRB consent form, and the pretest. The researcher asked participants to print the IRB consent form and pretest, complete each, and mail to the WCEE office c/o the WCEE Outreach Program Manager. This was done so the researcher would not see the pretest before the course was complete.

UWSP offered the pilot of *TAEO* July 30th – August 28th 2006. Although the course instruction was four-weeks in length, participants were given access to the *TAEO* and D2L websites one week prior to the start of the course as well as one extra week (at the end) to complete the intensive Unit 4 assignments.

The course timeline is as follows:

July 23rd-July 30th	Introductory Pages open
July 30th	Course Opens
Jul. 30th – Aug. 5th	Unit 1
August 6th – August 12th	Unit 2
August 13th – August 19th	Unit 3
August 20th – August 26th	Unit 4
August 27th – September 2nd	Last week for Unit 4 assignment
September 3rd	Course Closes

Units ran from Sunday 12:00am to Saturday 11:59pm. Although students could access any part of the course at anytime, assignments need to be submitted to the D2L Dropbox by the Saturday deadline to be accepted without penalty.

III. The Evaluation of the Online Course

There were three tools used to evaluate the following objectives:

3a. Measure statistical difference in knowledge obtained after having taken the course by administering a pretest-posttest.

3b. Determine revisions to *NRES 410/610 Teaching Abut the Environment Outdoors* by evaluating course content, structure, design, and technology.

3c. Assess the overall value of *NRES 410/610 Teaching About the Environment Outdoors* as a learning tool

A. Pretest-Posttest Design

A Pretest-Posttest Design was implemented to ascertain if perceived increase of knowledge occurred in participants after having completed *TAEO*. "The One-Group Pretest-Posttest Design is a type of experiment where a single group has a pre-experimental evaluation, then is influenced by the variable, and, finally, is evaluated after the experiment" (Leedy 1993).

Like many Pretest-Posttest Design studies, the pretest consisted of the exact same questions and format as the posttest (Appendix D). The pretest-posttest used for this research study was broken down into categories by Unit. Categories included, Teacher and Learner Considerations, Topics to Teach, Teaching Strategies and Activities, and Planning and Conducting Outdoor EE. Participants were asked to rate their knowledge in the various categories according to Likert Scale values 1 through 5 (1 being no knowledge and 5 being very knowledgeable.) There were also three open-ended questions. Students were asked to list additional environmental topics, EE strategies, and considerations for planning and conducting outdoor EE. The open-ended questions were intended to gather ideas for what could be included in the course in future offerings.

The participants officially enrolled in *TAEO* were emailed the pretest July 14th, 2006 and were required to mail it to the WCEE Outreach Program Manager prior to July 30th, 2006. The posttest was emailed to participants September 11th, 2006 after grades had been submitted to the University. Participants were required to reply to the email with the completed posttest by September 16th, 2006.

The two-tailed t-test assesses whether the means of the pretest and posttest are statistically different from one another. This analysis was appropriate for comparing the means of these two sets of data, and was used in testing the null hypothesis:

H_0: There is no increase in perceived knowledge regarding topics & techniques for outdoor environmental education after having completed *NRES 410/610 Teaching About the Environment Outdoors.*

B. Course Revisions

To determine the revisions that should be made to TAEO, the researcher implemented five formative evaluation surveys and one summative evaluation survey. These surveys used Likert Scale and open-ended questions to gain information on course content, structure, design, and technology. The five formative evaluation surveys were titled 'Course Introductory Pages,' 'Unit 1,' 'Unit 2,' 'Unit 3,' and 'Unit 4.' The summative evaluation survey was titled 'Overall Course Evaluation'. All surveys were designed on D2L and were completed by participants within a specified timeline in D2L. Originally, the researcher allowed only one attempt at each survey, but upon recommendation of students, increased the number of survey attempts by each student to two. Many of the survey questions were taken from previous UWSP graduate students Zbleski (2001), Wilcox (2004), and Mattano (2005).

The Course Introductory Pages survey asked eleven Likert scale questions (5 being strongly agree and 1 being strongly disagree) and ten open-ended comments on topics such as the course homepage, goals and objectives, syllabus, assignments, instructor information, computer requirements, links, course evaluations, and navigating D2L. (Appendix E)

Participants could complete this survey anytime throughout the duration of the course (July 23rd, 2006 – September 3rd, 2006).

The four unit surveys asked identical questions (Appendix F). Each unit survey asked ten Likert scale questions (5 being strongly agree and 1 being strongly disagree), two open-ended questions and one open-ended comment. Likert scale questions include topics such as sound goals and objectives, clarity of unit readings and assignments, ease of navigation and flow of content. The open-ended questions asked students to describe something they liked and something they disliked regarding each specific unit. Participants had two weeks to complete each survey. The time periods given for completing each unit evaluation are listed below.

Unit 1: July 30th – August 12th, 2006
Unit 2: August 6th, 2006 – August 19th, 2006
Unit 3: August 13th, 2006 – August 26th, 2006
Unit 4: August 21st, 2006 – September 9th, 2006 (one week after the Unit 4 assignment is due)

The Overall Course Evaluation Survey was the summative evaluation given to students after they had completed all course work and assignments (Appendix G). This survey was broken up into categories. The categories pertaining to this objective were, content, structure, design and technology, and personal perspectives. Participants could complete this survey after having completed all required readings and assignments and between August 27th and September 9th, 2006.

The course content section asks ten Likert scale question (5 being strongly agree and 1 being strongly disagree) and one open-ended comment. Likert scale questions include topics such as helpfulness of assignments, use of internet resources, and clarity and flow of content.

The course structure section asks seven Likert scale question (5 being strongly agree and 1 being strongly disagree) and one open-ended comment. Likert scale questions include design and layout, organization of website, organization of material, and interaction between students and instructor.

The design and technology section asks seven Likert scale questions (5 being very successful and 1 being very unsuccessful) and one open-ended comment. Likert scale questions include topics such as content accessibility, ease of navigation, ability to communicate online, and speed and ease of downloading course material.

The personal perspectives section asked three open-ended questions that helped to determine revisions to the course.

Descriptive statistics were used to report results of the surveys. These include calculations for means and standard deviations for the Likert Scale questions. Open-ended comments were listed and categorized.

C. Course Value

The Overall Course Evaluation Survey was the summative evaluation given to students after they had completed all course work and assignments. This survey was broken up into categories. The category pertaining to this objective was the personal perspectives section. Participants could complete this survey after having completed all required readings and assignments and between August 27th and September 9th, 2006.

The personal perspectives section asks seven Likert scale question (5 being strongly agree and 1 being strongly disagree), two open-ended comments, seven open-ended questions and two choice questions. Likert scale questions include topics such as online vs. face-to-face course, satisfaction, workload, and depth of topics. Open-ended questions include topics such as perceived value of the course, confidence with teaching outdoors, usefulness of information, likes, and dislikes. The two choice questions asked about individual time commitment and occupation.

CHAPTER FOUR

RESULTS

I. The Development of *NRES 410/610 Teaching About the Environment Outdoors*

II. The Pilot of *NRES 410/610 Teaching About the Environment Outdoors*

III. The Evaluation of *NRES 410/610 Teaching About the Environment Outdoors*

A. Pretest-Posttest

B. Course Revisions

i. Course Introductory Pages

ii. Unit 1

iii. Unit 2

iv. Unit 3

v. Unit 4

vi. Overall Course Evaluation

C. Course Value

The aim of this study was to develop, pilot, and evaluate the one-credit UWSP online course *NRES 410/610 Teaching About the Environment Outdoors (TAEO).* The course was developed between September 2004 and July 2006 and piloted July 30th – September 2nd, 2006. Evaluation of the pilot included a pretest-posttest, formative evaluation surveys and a summative evaluation survey.

I. The Development of *NRES 410/610 Teaching About the Environment Outdoors*

The objectives for developing this online course included:

1a. Identify course goals and objectives and develop course content and assignments

1b. Design course homepage and D2L site

1c. Obtain feedback from graduate committee and course approval from appropriate UWSP and CNR committees

TAEO provides teachers with means for effective outdoor pedagogy, environmental topics, outdoor environmental strategies, internet resources, and experience leading or observing environmental programs in the outdoors. The goal of *TAEO* is to increase participants' knowledge and confidence with teaching environmental topics outdoors. The unit goals and objectives were developed by the researcher and her advisor.

TAEO Goals and Objectives:

Unit 1: Teacher and Learner Considerations

Goal: Unit 1 will give course participants an introduction to outdoor education and how outdoor environmental education can enhance effective pedagogy by using a variety of learning styles and the theory of multiple intelligences.

Objectives for Unit 1:
1. Discuss the definition and brief history of outdoor education
2. Explain reasons for why OEE is important in education
3. Evaluate which outdoor educator competencies are personal strengths and weaknesses
4. Evaluate how you learn best
5. Provide an original example of how the theory of Multiple Intelligences could be achieved in an outdoor learning experience
6. Become aware of characteristics of these age groups as it relates to outdoor environmental education

Unit 2: Topics to Teach

Goal: Course participants will examine many environmental topics that can be effectively taught outdoors.

Objectives for Unit 2:
1. Identify environmental topics often taught outdoors.
2. Brainstorm specific ways to could teach these topics using the theory of multiple intelligences or learning styles.
3. Evaluate where you find aesthetics (joy and pleasure) in nature.
4. Describe ways you can use the theory of multiple intelligences or learning styles, to encourage students to identify their own feelings towards something in the natural world.

Unit 3: Teaching Strategies and Activities

Goal: Course participants will research eleven strategies and techniques for teaching environmental education outdoors and locate lesson plans using internet resources.

Objectives for Unit 3:
1. Become aware of different strategies and activities when teaching about the environment in the outdoors.
2. Gain experience doing a nature journaling activity outdoors.
3. Locate outdoor environmental education lesson plans on the internet and share findings on the discussion board.
4. Specifically explain how you would adapt any one of the eleven teaching strategies and activities to meet a variety of learning styles or intelligences.

Unit 4: Planning and Conducting Outdoor Environmental Education

Goal: After exploring the considerations for planning and conducting outdoor environmental education, course participants will have the opportunity to teach a lesson found in the previous chapter to the audience of their choice, or attend an outdoor environmental education program and reflect on the experience.

Objectives for Unit 4:
1. Become aware of the steps for preparing an outdoor activity, logistics, and safety concerns.
2. Become aware of assessment techniques that follow the theory of multiple intelligences and creative outdoor learning.
3. Become aware of the importance for pre- and post-visit activities in building a concrete learning experience
4. Become aware of techniques for group management for the outdoor classroom
5. Gain practice with outdoor environmental education either observing or conducting a field experience
6. Submit a summary or lesson plan and detailed reflection including strengths, weaknesses

and overall achievement of the activity as it relates to teacher/learner needs, environmental topics, outdoor teaching strategies, and planning and preparation

The content for *TAEO* was taken from a variety of online resources and written texts. The researcher assembled the content according to the goals and objectives listed above. Revisit Appendix A for the list of resources and links used for content.

The unit outlines are as follows:

Unit 1: Teacher & Learner Considerations
I. Teaching Outdoor Environmental Education (OEE)
  A. What is Outdoor Education?
  B. Reasons for Teaching Outdoors
  C. Competencies of Outdoor Educators
II. Teaching & Learning Styles
  A. Learning Modalities
  B. Multiple Intelligences
III. Learner Characteristics
  A. Early Elementary
  B. Five-Nineteen Year Olds

Unit 2: Topics to Teach
I. Environmental Topics
  A. Adaptations
  B. Habitats
  C. Four Elements of Life
  D. Life's Interconnections
  E. Energy Flow
  F. Phenology
  G. Taxonomy
  H. Sustainability
II. Likely Outdoor Topics
  A. Teachable Moments
  B. Sense of Wonder & Place
  C. Aesthetics

Unit 3: Teaching Strategies & Activities
I. Strategies & Activities
  A. Leading a Hike
  B. Storytelling
  C. Creative Drama

D. Sensory Learning
E. Experiments
F. Games
G. Data Collection
H. Gardening
I. Nature Journaling
J. Scavenger Hunts
K. Field Trips

Unit 4: Planning & Conducting Outdoor EE
I. Teacher Planning
A. Preparing the Activity
B. Logistics & Safety
C. Assessment
II. Student Preparation
A. Pre- and Post-visit Activities
B. The Respect Rule

Three types of assignments were used to evaluate learners' perceived increase in knowledge and skills when teaching about the environment in the outdoors. There was one Head Outside, one Reading Reflection, and one Online Discussion required for each of the four units. Individual unit assignments are found in Appendix H.

The following includes a brief description of each assignment type:

1. Online Discussion assignments ask students to post a response to a given question or statement on the D2L discussion board. Participants are required to also respond to at least one other classmate's post with personal impressions, reactions, or reflections.

2. Head Outside assignments ask students to complete a task outdoors and report observations to the D2L secured assignment drop box.

3. Reading Reflection assignments ask students to recall, analyze, generalize, predict, or evaluate information in a research article or other document and report reflections to the D2L secured assignment drop box.

Grading the above assignments was done according to the rubrics found in Appendix I. Grades are based on a 4.0 scale (where 4.0 is the maximum). There are 100 total points available for the course. The points are awarded as follows:

- 4 Online Discussion assignments x 5 points each = 20 points
- 4 Head Outside assignments x 10 points each = 40 points
- 4 Reading Reflection assignments x 10 points each = 40 points

Total = 100 points

The UWSP online course *NRES 410/610: Teaching About the Environment Outdoors* is the most obvious product of this research. *TAEO* was given the URL address http://www.uwsp.edu/natres/nres610taeo/index.html and put online in June 2006. See Appendix J for the website map. All course information, syllabus, content, and assignments are found at this free website and available to anyone with an internet connection. Examples of the Homepage, Syllabus, Instructor Info and Unit pages can be found in Appendix K.

The researcher met with her advisor and committee members regarding their recommendations for the course. Some of the positive aspects of the course were said to be the integration of the multiple intelligences theory and ideas for assignments. A common criticism was that there was too much information and too many assignments for a one-credit course. The wording of a few assignments seemed unclear and vague. The flow between units was also an issue as it seemed to lack a logical order. These and other comments helped immensely to improve *TAEO*. The course content gained final approval on June 6th, 2006.

The Internal Review Board (IRB) at UWSP requires all researchers using human subjects to complete a tutorial. This researcher successfully completed the Human Subject Protection Training Tutorial on May 3rd, 2006. The application form, Letter of Consent (Appendix L), and evaluation tools were submitted to the IRB on May 4th, 2006. Dr. Holmes and the other members of the review board recommended that the researcher not include names of research participants in her written thesis or seminar presentation. The researcher made the adjustments and was granted IRB approval on May 9th, 2006.

II. The Pilot of *NRES 410/610 Teaching About the Environment Outdoors*

The objectives for piloting this online course were:

2a. Promote course to K-12 and nonformal teachers currently in the Extended Master's Program, Extended Master's perspective students, and graduates of the Extended Master's Program

2b. Select applicants to participate in the experimental pilot course

2c. Offer the one-month online course *NRES 410/610 Teaching About the Environment Outdoors* for one credit in Summer 2006.

The four-week online course was promoted through the WCEE, UW Continuing Education and the Extended Masters in Environmental Education Program. Educators in the program are typically K-12 licensed teachers. The researcher and her committee decided to promote *TAEO* to perspective students, current students and graduates of the program because this is the audience *TAEO* was designed to target.

Educators were first contacted by the WCEE Program Specialist, by email on June 6th, 2006. The Program Specialist was asked to send the initial email because she was a familiar name with the teachers in the Extended Master's Program. A letter explaining the goals for the course and a little about the pilot process was attached to the email. The WCEE Outreach Programs Coordinator co-signed the letter with the researcher to add familiarity and credibility to the course (Appendix M). By June 21st, 2006, 16 people responded to the email expressing serious interest in taking the pilot course.

Sample size was limited to 10 for the pilot course. The graduate faculty coordinator of the EE Extended Master's Program assisted with the selection due to familiarity with the students. Applicants were selected based on the extent of their EE background. Those with more experience with UWSP courses and knowledge of EE would be beneficial in evaluating the course and giving suggestions for revision and change. Four individuals selected were graduates of the Extended Master's in EE program. Four individuals selected were current students of the program ranging from 18-29 graduate credits already taken. Two students were MS Prospects each having taken more than four credits. Each participant was required to sign the research consent form.

Table 4.1 shows the participant's responses to questions on their application. This information was used to help determine who was selected for the pilot course.

Table 4.1: *TAEO* Participant Application Questions

Student	*Grades currently taught*	*# of UWSP online classes completed*	*# of years doing EE*	*# of times per semester students go outside*	*# of UWSP graduate credits obtained*
1	7-12	3 or 4	16	15	4
2	7-8	2	4	5-20	11
3	12	6	6	10-15	25
4	3	0	9	25	30+
5	9-12	Several	7	5-12	30+
6	9 & 12	4	15	15-20	18
7	9 & 11-12	4	12	5-6	30+
8	7	5	6	1	22
9	K-6	6	6	6	30+
10	9-12	7	3	8	24

An electronic course packet was sent out to all selected participants on July 14th, 2006. The course packet contained a welcome from the instructor, information on how to access the site, course timeline, D2L log-on information, and information on the Unit 4 assignments. The course packet can be found in Appendix N.

Students enrolled in the class were also given a username and password by the University to access the password-protected D2L site. At the D2L site, students were able to submit assignments, view grades, and participate in asynchronous discussions.

UWSP offered the pilot of *TAEO* July 30th – August 28th 2006. Although the course began July 30th, 2006, the *TAEO* website and D2L site was made available to participants one week prior.

Participants were encouraged to familiarize themselves with navigating the site, assignments, grading scale & rubrics, and logging on to D2L. Once logged onto D2L, participants had the opportunity to locate the Content links, Discussion, Classlist, Grades, Dropbox, and Surveys.

The researcher was also the developer and instructor for the course. She was responsible for grading, responding to participant inquiry and site maintenance throughout the pilot.

Every student finished the course and all assignments within the given time. As expected, all ten students did well in the course (A, 4.0). All students also took each unit evaluation survey (n=10) except for 3 questions (n=9) that are noted with an (*) throughout this chapter.

III. The Evaluation of *NRES 410/610 Teaching About the Environment Outdoors*

The objectives for evaluating the online course are:

3a. Measure statistical difference in knowledge obtained after having taken the course by administering a pretest-posttest

3b. Determine revisions to *TAEO* by evaluating course content, structure, design and technology

3c. Assess the overall value of *NRES 410/610 Teaching About the Environment Outdoors* as a learning tool

A. Pretest-Posttest

NRES 410/610: Teaching About the Environment Outdoors was evaluated using the Pretest-Posttest Design. The researcher administered a pretest before the first week of class and a posttest upon completion of all required readings and assignments to all ten participants. This evaluation tool was used to gather information on the change in perceived knowledge of outdoor environmental education topics as a result of taking this course.

The hypothesis being tested is,

> H_0: There is no increase in perceived knowledge regarding topics & techniques for outdoor environmental education after having completed *NRES: 410/610 Teaching About the Environment Outdoors.*

The Pretest-Posttest asked participants to rank their knowledge on different subjects. The Likert scale range was: 5-very knowledgeable; 4-somewhat knowledgeable; 3-neutral; 2-little knowledge; 1-no knowledge. Revisit Appendix C for to view the questions on the pretest-posttest.

The means were calculated for all of the twenty-five questions for both the pretest and posttest. This was done to see if there were specific sections of *TAEO* that had large increases (or no increases at all) of participant knowledge. The difference between the pretest and posttest means was then made into a percent and is reported in Table 4.2. Table 4.2 and Figure 4.1 on the following pages illustrate that each question had at least some improvement on the posttest as compared to the pretest. The section with the greatest improvement in

perceived knowledge was *I. Teacher & Learner Considerations* with an average increase of 15%. Those with modest improvement included *IV. Planning & Conducting Outdoor EE* and *III. Teaching Strategies & Activities* with an average increase of 12% and 11.6% respectively. The section with the least improvement was *II. Outdoor Environmental Topics* with an average increase of only 6%.

The single greatest increase on the pretest-posttest was III.4 Sensory Learning in *Section III*. This question increased 23% among participant responses. The questions with the least amount of improvement included II.5 Energy Flow and II.7 Sustainability from *Section II*, and III.5 Experiments from *Section III*. Although each question did improve, the difference between the pretest and posttest was only 2%.

Table 4.2: Pretest – Posttest Percent Increase by Question

I. Teacher & Learner Considerations (n=10)

Questions	Pre-Test Mean	Post-Test Mean	Difference	% Increase
What is Outdoor Environmental Education (OEE)?	4.00	4.80	.80	16%
Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE	3.40	4.40	1.00	20%
Teaching and learning styles	4.30	4.60	.20	10%
Environmental sensitivity	4.20	4.90	.70	14%

II. Outdoor Environmental Topics (n=10)

Questions	Pre-Test Mean	Post-Test Mean	Difference	% Increase
Adaptations	4.50	4.80	.30	6%
Habitats	4.70	4.90	.20	4%
Four Elements of Life (sun, air, water & soil)	4.30	4.50	.20	4%
Life's Interconnections	4.50	4.80	.30	6%
Energy Flow (i.e. food chain)	4.60	4.70	.10	2%
Phenology (cycles)	3.80	4.70	.90	18%
Sustainability	4.50	4.60	.10	2%

III. Teaching Strategies & Activities (n=10)

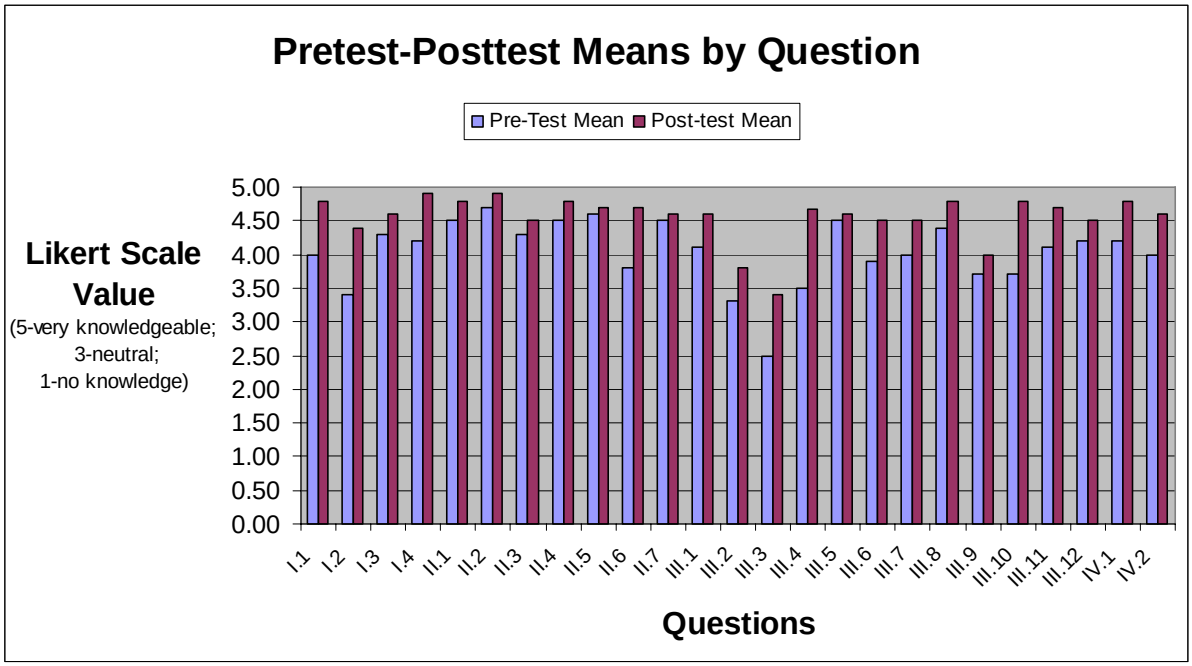
Questions	Pre-Test Mean	Post-Test Mean	Difference	% Increase
Leading a hike	4.10	4.60	.50	10%
Storytelling	3.30	3.80	.50	10%
Creative drama	2.50	3.40	.90	18%
Sensory learning	3.50	4.67	1.17	23%
Experiments	4.50	4.60	.10	2%
Games	3.90	4.50	.60	12%
Simulation	4.00	4.50	.50	10%
Data Collection	4.40	4.80	.40	8%
Gardening	3.70	4.00	.30	6%
Nature Journaling	3.70	4.80	1.10	22%
Scavenger Hunts	4.10	4.70	.60	12%
Field Trips	4.20	4.50	.30	6%

IV. Planning & Conducting OEE Programs (n=10)

Questions	Pre-Test Mean	Post-Test Mean	Difference	% Increase
Resources and activity guides for OEE activities	4.20	4.80	.60	12%
Internet websites on the topic of OEE	4.00	4.60	.60	12%

Figure 4.1 illustrates the pretest mean (left bar) as compared to the posttest mean (right bar). For each question (listed on the X-axis) there was some increase. The means used in this figure is actually a mean of the ten participant responses for each question.

Figure 4.1: Pretest – Posttest Means by Question



Participant responses to the individual questions, means, and standard deviations, and open-ended question responses for the pretest can be found in Appendix O. The posttest responses are found in Appendix P. The statistical comparative analysis of means and standard deviations for the pretest-posttest are found in Appendix Q.

The means were calculated for each of the ten students for both the pretest and posttest. The difference between the means was converted to a percent and reported in Table 4.3. Table 4.3 and Figure 4.2 on the following pages illustrate that each student gained some knowledge as a result of completing *TAEO*. Three participants (#5, #7, and #10) had an improvement of

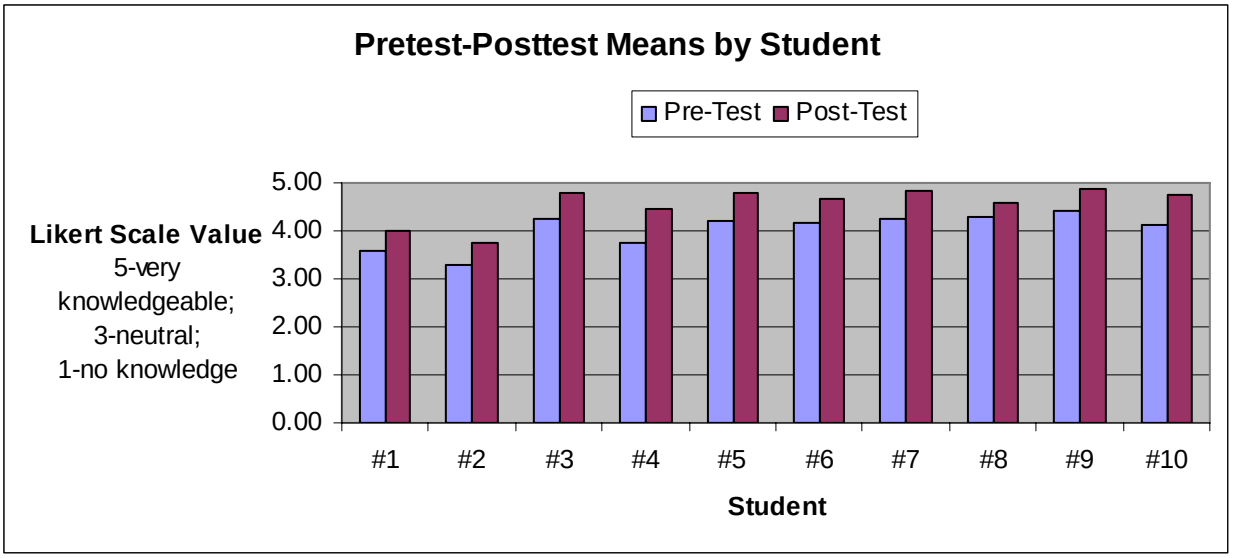
12% or greater while the least improvement was 6.4% by participant #8. Although participant #8 had the least improvement overall, they boasted a 60% increase for the question *IV.2 Internet websites on the topic of OEE,* posting a 2 (little knowledge) for question *IV.2* on the pretest and a 5 (very knowledgeable) on the posttest. On the other hand, there were students whose Likert Scale means decreased on specific questions on the posttest. Student #1 posted a 4 (somewhat knowledgeable) for every question on the posttest, indicating that she perceivably lost knowledge about question *II.3 Four Elements of Life* and *II.7 Sustainability* which she had previously indicated a 5 (very knowledgeable).

Table 4.3: Pretest – Posttest Percent Increase by Student

Student	Pre-Test Mean	Post-Test Mean	Difference	% Increase
#1	3.60	4.00	.40	8%
#2	3.28	3.76	.48	9.6%
#3	4.24	4.80	.56	11.2%
#4	3.76	4.46	.70	14%
#5	4.20	4.80	.60	12%
#6	4.16	4.68	.52	10.4%
#7	4.24	4.84	.60	12%
#8	4.28	4.60	.32	6.4%
#9	4.40	4.88	.48	9.6%
#10	4.12	4.76	.64	12.8%

Figure 4.2 illustrates the pretest mean (left bar) as compared to the posttest mean (right bar). For each student (listed on the X-axis) there was some increase. The means used in this figure is actually a mean of all 25 pretest-posttest question responses for each participant.

Figure 4.2: Pretest - Posttest Means by Student



Participant responses to the individual questions, means, standard deviations, and open-ended responses for the Pretest and the Posttest are found in Appendices O and P respectively.

The researcher calculated the means for each student's pretest and posttest. She then collapsed the means; in other words, she found one mean for the pretest by using the individual student pretest means and one mean for the posttest by using the individual student posttest means. Therefore the data used for the t-test is the mean of the means of student responses to the pretest and posttest. Results indicate that there was a significant difference in student performance between the pretest (M = 4.03, SD = .36) and the posttest (M = 4.56, SD = .57), t(9) = 2.94, p = .05. See Appendix Q for complete calculations.

B. Course Revisions

TAEO was evaluated using five formative evaluations and a summative evaluation to help determine revisions to the course. The researcher implemented a formative evaluation for the course introductory pages and at the conclusion of each week-long unit in the pilot study. The summative evaluation was administered after students had completed all required readings and assignments. These evaluation tools were used to gather information about course content, structure, design, and technology. The Likert Scale questions considered for course revisions had means of less than 4.0. The open-ended questions and comments that were considered for course revisions were found in at least two different surveys and were reported at least three times. Assume all ten students completed each survey (n=10) unless otherwise noted.

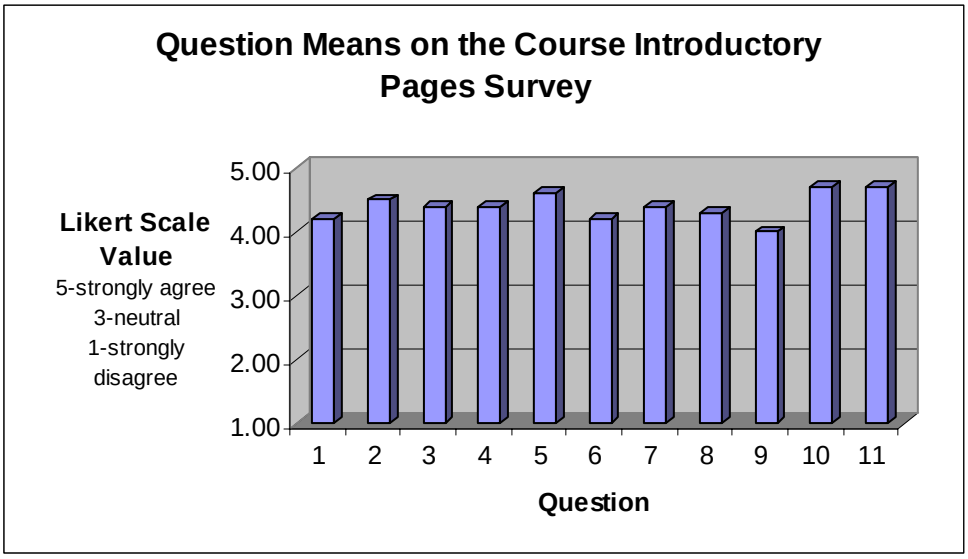
i. Course Introductory Pages

All Course Introductory Pages surveys were completed by August 10th, 2006. The survey can be found in Appendix E. The Course Introductory Pages survey asked eleven Likert scale questions (5 being strongly agree and 1 being strongly disagree) and ten open-ended comments on topics such as the course homepage, goals and objectives, syllabus, assignments, instructor information, computer requirements, links, course evaluations, and navigating D2L. Likert Scale statistical results including means and standard deviations are found in Appendix R and open-ended comments are found in Appendix S.

The means for each question are illustrated in Figure 4.3. The means in this figure were taken

from a compilation of all individual participant means. All topics had very positive Likert scores and comments. Means ranged from 4.0 – 4.7 with 5.0 being the highest possible score.

Figure 4.3: Question Means on the Course Introductory Pages Survey



The results show that four participants felt neutral (3) or disagreed (2) that logging into D2L was no problem at all (Question 9). The responses in the open-comment section did not indicate what the problems were with the log-on process.

ii. Unit 1

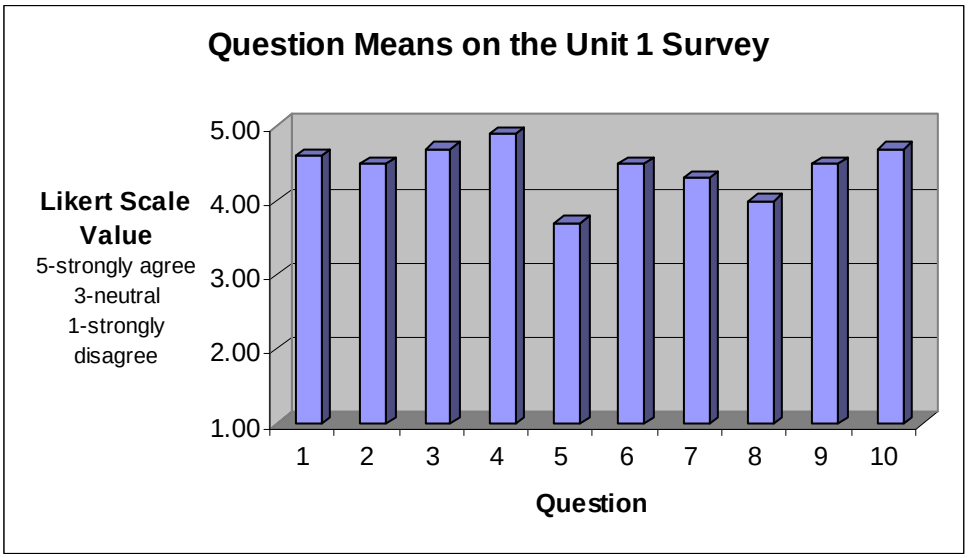
All Unit 1 surveys were completed by August 12th, 2006. The survey can be found in Appendix F. The Unit 1 survey asked ten Likert scale questions (5 being strongly agree and 1 being strongly disagree), two open-ended questions and one open-ended comment. Likert scale questions include topics such as sound goals and objectives, clarity of unit readings and assignments, ease of navigation and flow of content. The open-ended questions asked

students to describe something they liked and something they disliked regarding Unit 1. Likert Scale statistical results including means and standard deviations are found in Appendix T and open-ended comments are found in Appendix U.

Question 5 on the Unit evaluation survey asked participants if they felt the course was redundant. In this case, a low score would be good indicating that participants did **not** feel the course was redundant. However, for the presentation of data, the Likert scale responses for question 5 were reversed. For example, a response of "5" is portrayed in Figures 4.4 and 4.5 as a "1" and a mean of 2.0 is portrayed as 4.0 on a scale where 5.0 is the highest score.

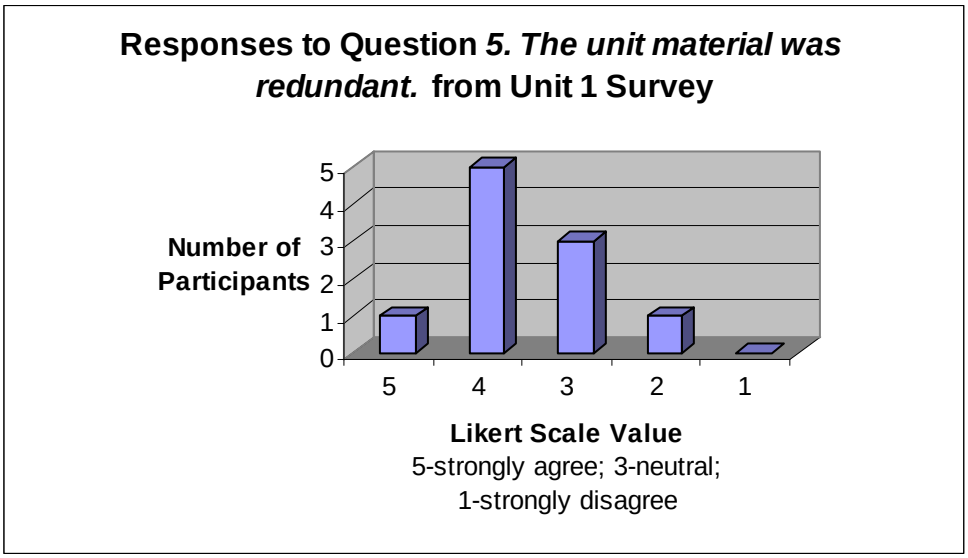
The means for each question in Unit 1 are illustrated in Figure 4.4 below. The means used in this figure are a compilation of all individual participant mean scores. Means ranged from 3.70 – 4.90 on a scale where 5.0 is the highest possible score.

Figure 4.4: Question Means on the Unit 1 Survey



There was one Likert Scale question and three comments from Unit 1 the researcher considered for revising the course. The responses to question *5. The unit material was redundant.* is found in Figure 4.5. The graph shows the number of participants (Y-axis) that chose each Likert Scale option (X-axis). Question 5 had an adjusted mean of 3.7 (where 5.0 is the highest).

Figure 4.5: Responses to Question *5. The unit material was redundant.* from Unit 1 Survey.



The participant open-ended comments on the Unit 1 survey that were considered for revision included:

- *"Slightly redundant per the reading reflection and the teacher and learner considerations. I felt like I had to review my competencies as an outdoor educator a few times."*

- *"I feel as though most of us have talked the multiple intelligence angle to death. It was nice to revisit, but I felt as though I already know tons about this subject."*
- *"I wish the online intelligence test would have included the natural intelligence. Is there an updated web version available?"*

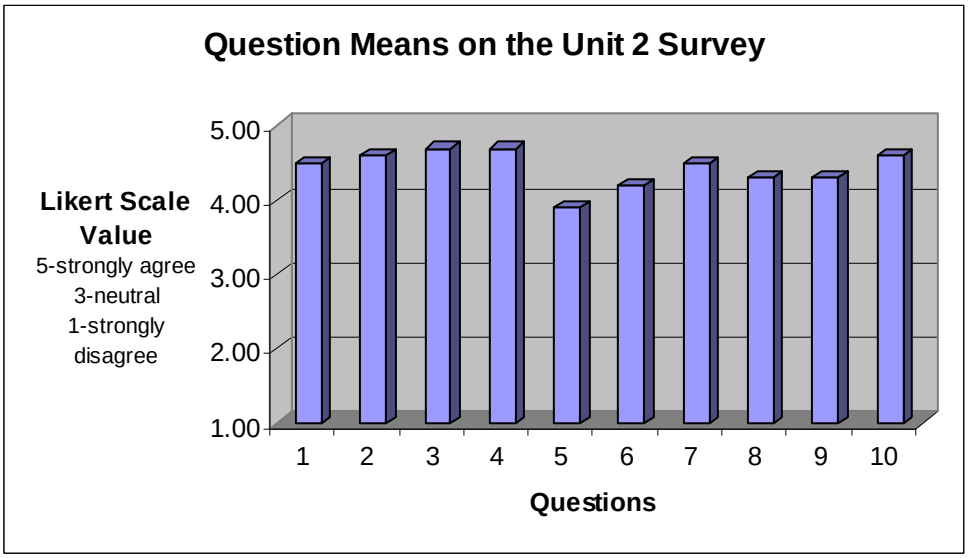
iii. Unit 2

All Unit 2 surveys were completed by August 12th, 2006. The survey can be found in Appendix F. The Unit 2 survey asked ten Likert scale questions (5 being strongly agree and 1 being strongly disagree), two open-ended questions and one open-ended comment. Likert scale questions include topics such as sound goals and objectives, clarity of unit readings and assignments, ease of navigation and flow of content. The open-ended questions asked students to describe something they liked and something they disliked regarding each specific unit. Likert Scale results including means and standard deviations are found in Appendix V and open-ended comments are found in Appendix W.

Similar to Unit 1, the Likert scale responses for question 5 were reversed. For example, a response of "5" is portrayed in Figure 4.6 as a "1" and a mean of 2.0 is portrayed as 4.0 on a scale where 5.0 is the highest.

The means for each question in Unit 2 are listed in Figure 4.6. Means used in this figure are a compilation of all individual participant means. Means ranged from 3.90 – 4.70 on a scale where 5.0 is the highest.

Figure 4.6: Question Means on the Unit 2 Survey



Again the question with the lowest mean of 3.9 was number *5. The unit material was redundant.* This item was considered for a revision in the course. Comments also indicated that participants felt there was redundancy in content and also with the continued theme of the multiple intelligences theory.

The open-ended comments on the Unit 2 survey that were considered for revision included:

- *"Leave the multiple intelligences and learning styles in Unit 1. The number of teaching subject areas was enough to reflect on. The rehashing of learning styles, etc. was redundant and unnecessary."*
- *"I didn't like having to brainstorm how to teach the units using different learning styles – as I teach so many different concepts it was hard for me to generate the ideas without actually being in the classroom."*

- *"I already knew quite a bit about adaptations, habitats, energy flow, etc. Many of us are quite a ways through our Master's program and have touched on these concepts many, many times."*
- *"I wish that the content for this course's webpage was not all quoted from other sources."*

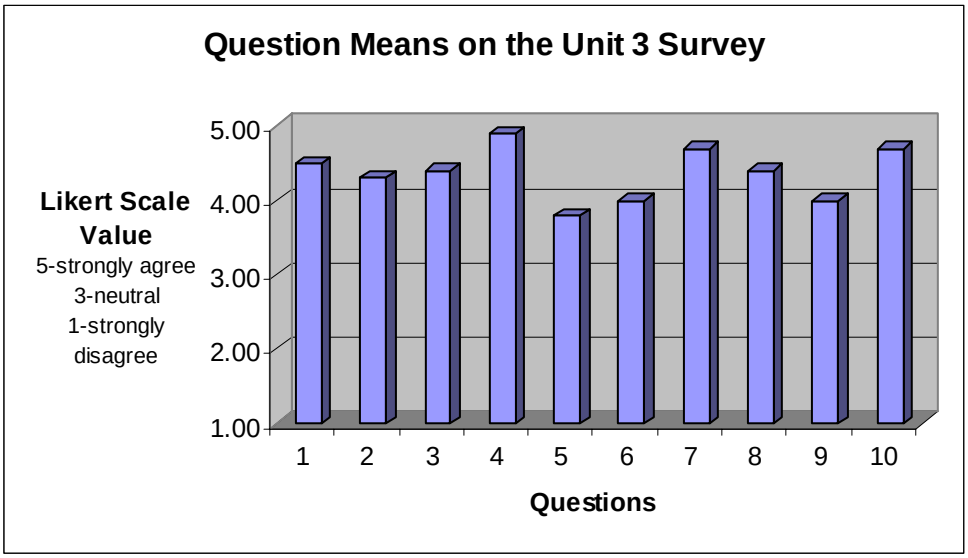
iv. Unit 3

All Unit 3 surveys were completed by August 30th, 2006. The survey can be found in Appendix F. The Unit 3 survey asked ten Likert scale questions (5 being strongly agree and 1 being strongly disagree), two open-ended questions and one open-ended comment. Likert scale questions cover topics such as goals and objectives, clarity of unit readings and assignments, ease of navigation and flow of content. The open-ended questions asked students to describe something they liked and something they disliked regarding each specific unit. Likert Scale results including means and standard deviations are found in Appendix X and open-ended comments are found in Appendix Y.

Similar to previous unit evaluations, the Likert scale responses for question 5 were reversed. Therefore if a participant indicated a "1" on the survey, it is presented in Figure 4.7 as a "5."

The means for each question in Unit 3 are listed in Figure 4.7. The means used for this figure are a compilation of individual participant means from Unit 3 survey. Means ranged from 3.80 – 4.70 no a scale of 5.0 where 5.0 is the highest score. Responses were still good overall; however, there were three specific areas that were not as good as previous Units.

Figure 4.7: Question Means on the Unit 3 Survey



There were three questions in Unit 3 that were considered for course revisions. The questions with means lower than 4.0 included:

5. The unit material was redundant. with a mean of 3.8

6. The unit assignments were clear and had specific instructions. with a mean of 3.9

9. The directions for the required readings and assignments were clear. with a mean of 3.9

The student responses for these questions can be found in Figures 4.8, 4.9, and 4.10 respectively. The graphs show how many students (Y-axis) chose each Likert Scale value (X-axis).

Figure 4.8: Responses to Question *5. The unit material was redundant.* from Unit 3 Survey

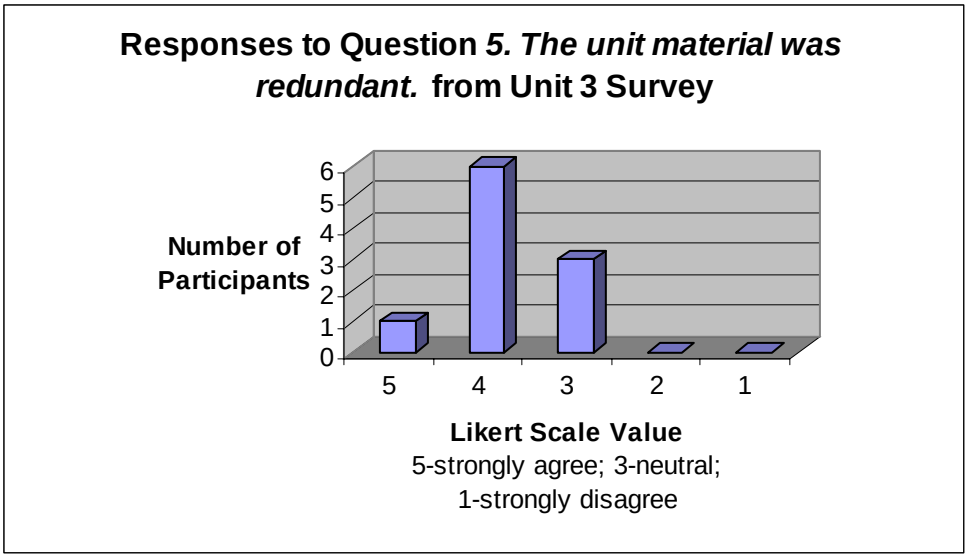


Figure 4.9: Responses to Question *6. The unit assignments were clear and had specific instructions.* from Unit 3 Survey.

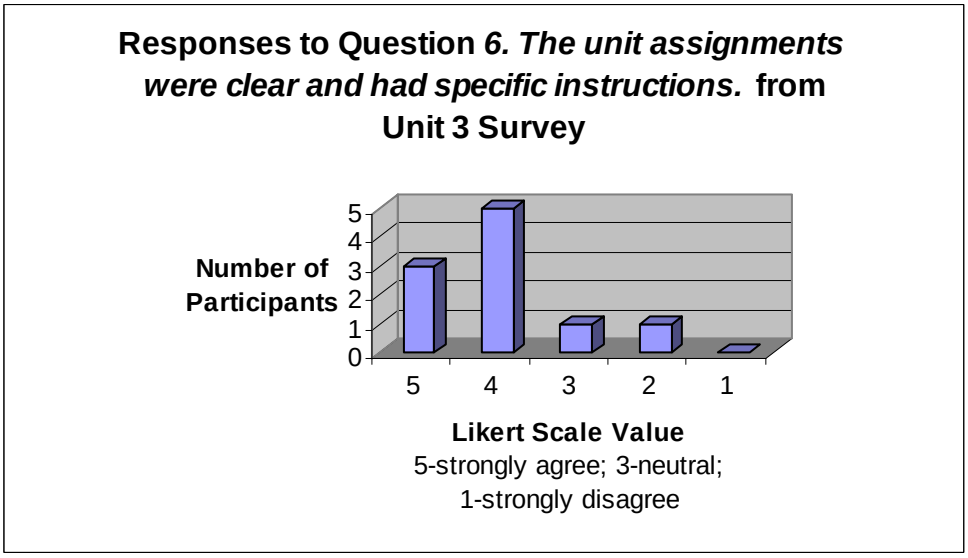
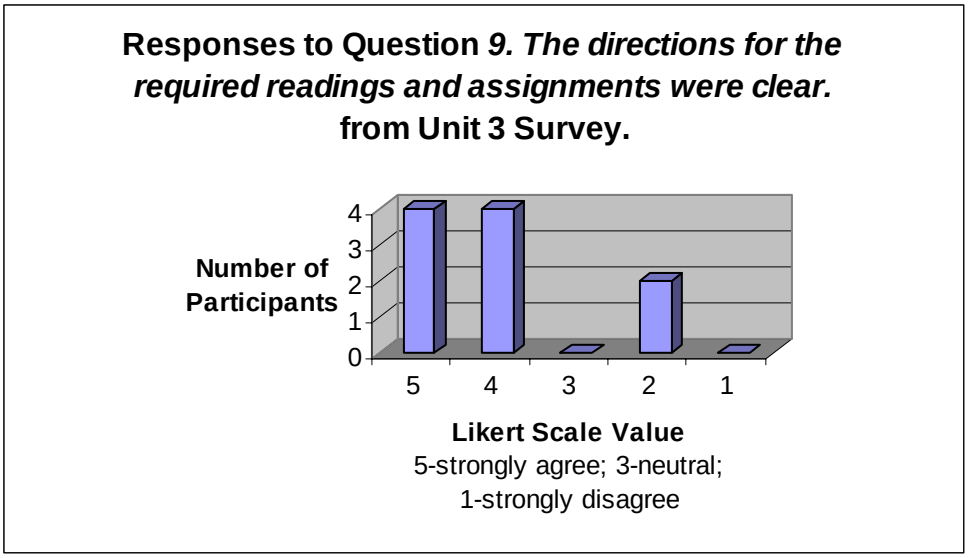


Figure 4.10: Responses to Question *9. The directions for the required readings and assignments were clear.* from Unit 3 Survey.



Along with these Likert Scale questions, there were four open-ended comments on the Unit 3 survey that were considered for revision. These include:

- *"Continued overkill on the learning styles/multiple intelligences."*
- *"I didn't understand the reading reflections assignment at all. What 11 teaching strategies?"*
- *I didn't understand the reading reflection – but after someone asked the same question I was thinking, I was able to put together some thoughts on adapting an activity that I currently use in class to meet a variety of learning styles."*
- *"Too much quoted text in readings."*

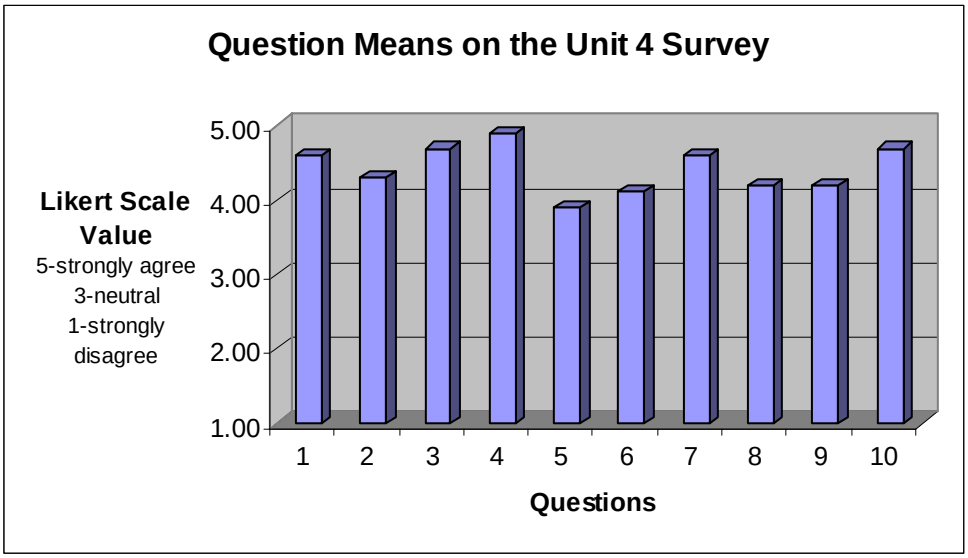
v. Unit 4

All Unit 4 surveys were completed by September 5th, 2006. The survey can be found in Appendix F. The Unit 4 survey asked ten Likert scale questions (5 being strongly agree and 1 being strongly disagree), two open-ended questions and one open-ended comment. Likert scale questions include topics such as sound goals and objectives, clarity of unit readings and assignments, ease of navigation and flow of content. The open-ended questions asked students to describe something they liked and something they disliked regarding each specific unit. Likert Scale results including means and standard deviations are found in Appendix Z and open-ended comments are found in Appendix AA.

Just like previous unit evaluation surveys, the Likert scale responses for question 5 were reversed. For example, a mean of "2.0" is portrayed in Figure 4.11 as a "4.0" on a scale where 5.0 is the highest possible score.

The means for each question on the Unit 4 survey are listed in Figure 4.11. The means for this figure are a compilation of all individual participant means on the Unit 4 survey. Means ranged from 3.90 – 4.89 on a scale of 5.0 where 5.0 is the highest possible score.

Figure 4.11: Question Means on the Unit 4 Survey



The questions with the lowest means were again questions *5. The Unit material was redundant.* (mean = 3.9) and question *6. The unit assignments were clear and had specific instructions.* (mean = 4.11). There were two participants who indicated that there was still some redundancy in Unit 4 and two others indicated that some of the assignments were confusing. The remaining 70% of participants who responded to this question found they strongly agreed that the assignments were worded clearly. The questions of redundancy and wording of assignments were considered for revision along with the following two comments.

The comments on the Unit 4 survey that were considered for revision:

- *"I felt as though the directions were very unclear. A better distinction needs to be made between the Head Outside portion and the Reading Reflection portion."*

- *Contained basic material that I seemed to have picked up along the way in all the master's courses dealing with the outdoors.*

vi. Overall Course Evaluation

All surveys were completed by September 5th, 2006. The survey can be found in Appendix G. The Overall Course Evaluation survey was broken up into four sections. The sections evaluated for this objective include:

i. course content
ii. course structure
iii. design & technology
iv. personal perspectives

There were a total of 31 Likert scale questions (5 being strongly agree or very successful and 1 being strongly disagree or very unsuccessful), five open-ended comments, seven open-ended questions and two choice questions. Likert Scale statistical results including means and standard deviations are found in Appendix BB and open-ended comments are found in Appendix CC.

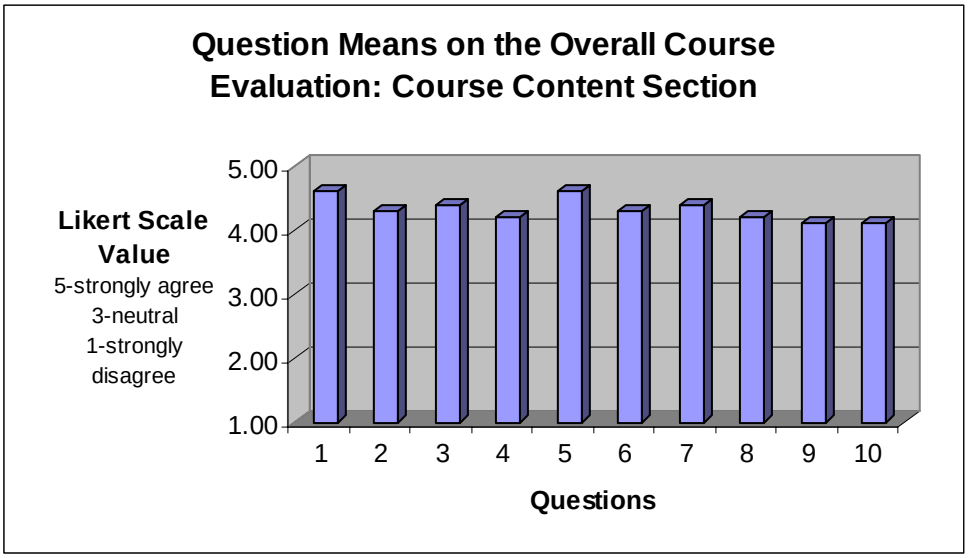
a. Course Content:

Overall, the course content section had very positive responses. The responses to question *10. There were obvious gaps in content.* had low scores indicating that participants did not feel there were obvious gaps in the content. However, for presentation of data, the Likert scale

responses for question 10 were reversed. For example, a mean of 2.0 is portrayed in Figure 4.12 as a 4.0 on a 5.0 scale where 5.0 is the highest possible score.

The means for each of the ten question are listed in Figure 4.12. Means for this figure are a compilation of all individual participant means. Means ranged from 4.1 – 4.6 on a scale of 5.0 where 5.0 is the highest score.

Figure 4.12: Question Means on the Overall Course Evaluation: Course Content Section



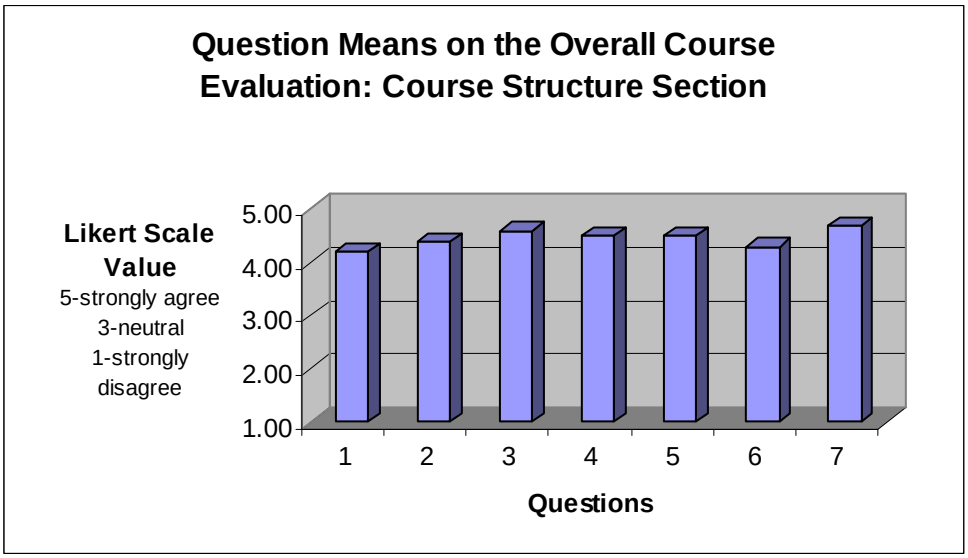
There were two open-ended comments from this section that were considered for revising the course:

- *"Well put together, some unnecessary repetition."*
- *"I also feel as though the final assignments should have been laid out much more specifically."*

b. Course Structure

The course structure section boasts the highest of all survey scores. The means for each of the seven questions are listed in Figure 4.13. Means for this figure are a compilation of all individual participant means and range from 4.20 – 4.70 on a 5.0 scale where 5.0 is the highest possible score.

Figure 4.13: Question Means on the Overall Course Evaluation: Course Structure Section.

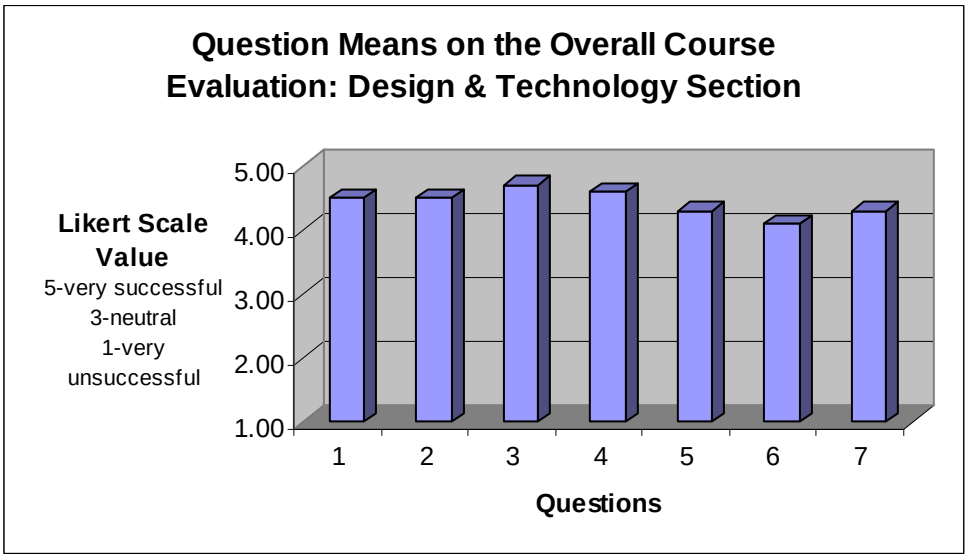


The researcher did not consider any of the responses in this section for revision. All participants strongly agreed or agreed that the structure of the course was fine.

c. Design & Technology:

The design and technology section also received positive scores from participants. The means for each of the seven questions are listed in Figure 4.14. Means for this figure are a compilation of all individual participant means. Means ranged from 4.10 – 4.70 on a 5.0 scale where 5.0 is the highest possible score.

Figure 4.14: Question Means on the Overall Course Evaluation: Design & Technology Section.



There was only one comment from the design and technology section that was considered for revising the course:

- *"This class was fine, but redundant for someone who graduated from the program."*

d. Personal Perspectives

Although there were no Likert Scale questions used from this section to determine revisions that should be made to *TAEO*, there were four open-ended comments.

- *"In terms of recommending to others…only if they have no knowledge of EE."*
- *Some of the "reading reflections" were repetitive.*"
- *"I thought some of the assignment descriptions and requirements to earn certain points on an assignment were vague."*
- *"Less quoted material in the content pages."*

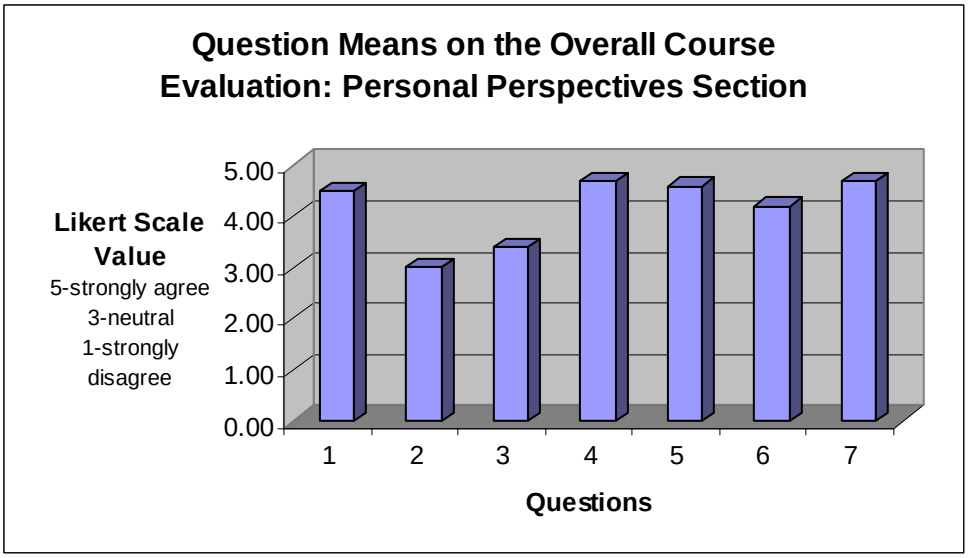
C. Course Value

The overall value of *NRES 410/610: Teaching About the Environment Outdoors* was evaluated using questions from the summative evaluation; specifically, from the personal perspectives section of the Overall Course Evaluation survey.

All surveys were completed by September 5th, 2006. The survey can be found in Appendix G and complete results including student answers and standard deviations can be found in Appendix CC.

The means for each question in the personal perspectives section are listed in Figure 4.15. Means for this figure are a compilation of mean scores from individual participant surveys. Means ranged from 3.00 – 4.70 on a 5.0 scale where 5.0 is the highest possible score.

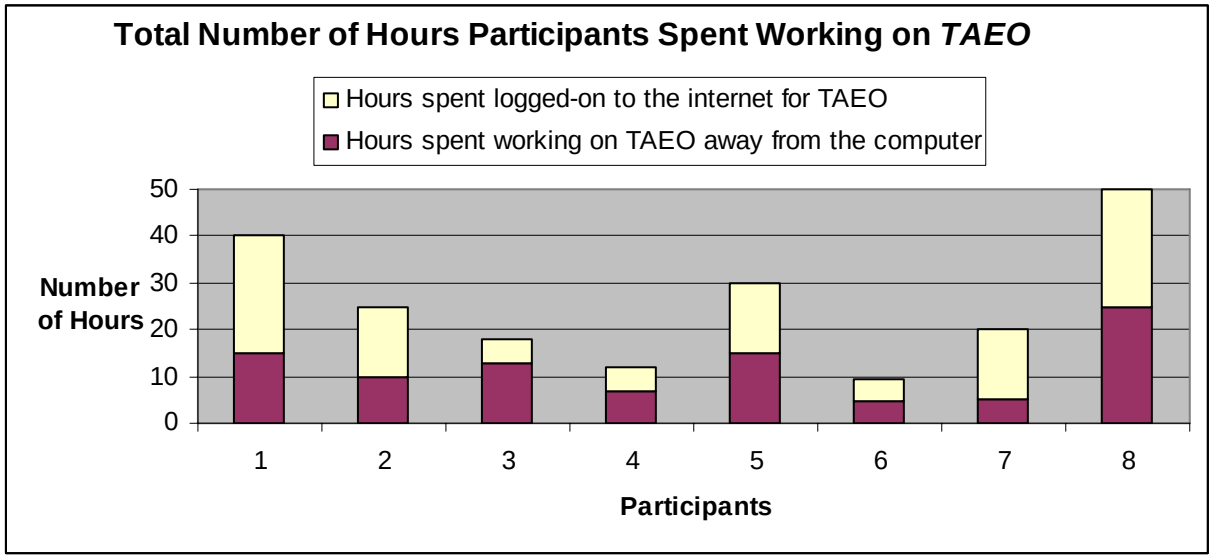
Figure 4.15: Question Means on the Overall Course Evaluation: Personal Perspectives Section.



Questions 1, 4, and 5 from Figure 4.15 showed that participants were glad they took the course, would take another online course as a result of this experience, and would recommend *TAEO* to others.

Participants indicated that they were logged onto the internet an average of 14 hours total, but spent an average of 25.6 hours working on the course throughout the four weeks. Only eight students responded to both questions (number of total hours spent working on *TAEO* and number of hours spent logged-on to the internet). Refer to Figure 4.16. The total number of hours is represented by each bar. The dark-shaded portion of the bar represents the amount of hours that each participant spent working on *TAEO* away from the computer. The light-shaded portion of the bar represents the amount of hours that each participant spent logged-on to the internet.

Figure 4.16: Total Number of Hours Participants Spent Working on *TAEO*



The Overall Course Evaluation survey also asked three open-ended questions that specifically addressed this objective. The questions were:

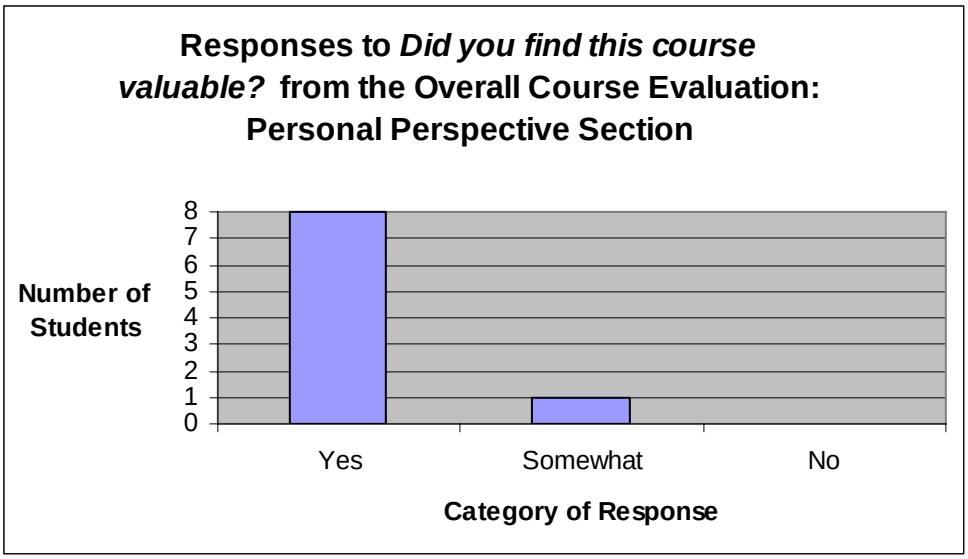
1. **Did you find this course valuable? Please explain.**
2. **Do you feel your confidence with teaching outdoors has increased as a result of this course? Please explain.**
3. **If you are an educator, do you intend to use the information and activities from this course with your students? Please explain.**

The researcher grouped each comment into one of three different categories: Yes, Somewhat, No. For each question, the participant comments are listed according to category. Figures 4.17, 4.18, and 4.19 illustrate Questions 1, 2, and 3 respectively.

1. Did you find this course valuable? Please explain.

Results indicate that 89% of participants who responded to this question found *TAEO* to be a valuable learning tool. The remaining 11% felt the course was somewhat of a valuable learning tool. These results are summarized in Figure 4.17.

Figure 4.17: Responses to *Did you find this course valuable?* from the Overall Course Evaluation: Personal Perspective Section (n=9)



The Yes Category:

- *Yes. I feel more confident incorporating outdoor ed into my Biology curriculum.*
- *Yes, when I find another teaching job, I will incorporate a lot of ideas, especially if the website is still accessible.*
- *Yes, it inspired me to try more outdoor education in my classroom.*
- *It was very valuable in that it gave me new methods and strategies to use with my students, not just theories and facts.*

- *Yes I did. The course gave me more resources to use with my class.*
- *YES – I found an outdoor camp in Almond, and I am going to use it with my classroom. I also found some very useable websites that I can go to in a hurry and pull off environmental information to use in class.*
- *Yes – many classroom ideas and information!*
- *Yes, It provided good ideas for my classes.*

The Somewhat Category:

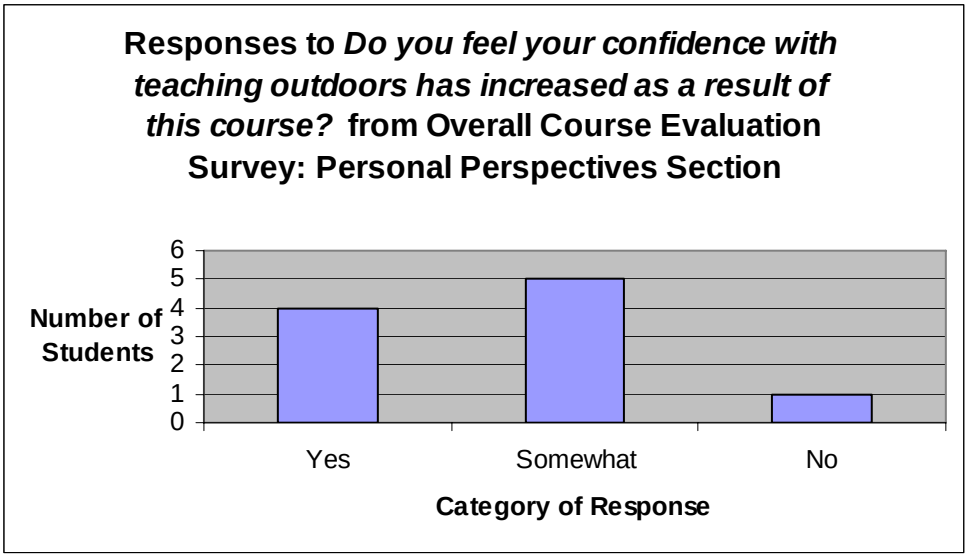
- *I found this course somewhat valuable. It was a review of much that I had already learned in the EE master's program at UWSP, but I did find some good resources to add to my collection. It seems like it would best fit early in the master's program or for someone who doesn't have a lot of experience with teaching EE or a great undergrad course.*

There were no comments that fell into the No category.

2. Do you feel your confidence with teaching outdoors has increased as a result of this course? Please explain.

Results indicate that 40% of participants felt that their confidence with teaching outdoors increased as a result of having taking *TAEO.* There were 50% of participants who concluded that the course somewhat increased their confidence, and 10% indicated that they were already quite comfortable teaching outdoors. These results are summarized in Figure 4.18.

Figure 4.18: Responses to *Do you feel your confidence with teaching outdoors has increased as a result of this course?* from the Overall Course Evaluation: Personal Perspectives Section



The Yes Category:

- *Yes. I will use the outdoor activity as a kick off to the environmental science class that I am teaching this year.*

- *Yes - in the fact that I picked up new ideas to use outdoors. The journaling activity was what I was looking for – not necessarily a game or activity to do while outside, but a chance to observe nature and utilize one's senses and thoughts. It is valuable to go outside and sit and observe – you don't always have to have a strenuous agenda planned!*
- *Yes, I feel as though I have more knowledge and more resources at my fingertips for teaching about the outdoors.*
- *I think so. Not only did we read about it, we actually experienced it with Unit 4.*
- *Now that I have new activities, I think my confidence has increased.*

The Somewhat Category:

- *I have a couple more tricks to add to my bag.*
- *Somewhat. After completing the master's program, I felt pretty confident, so this was basically a review.*
- *I feel like I had already been very comfortable in the outdoors, but teaching more of a variety of ways to accommodate all learning styles is something I certainly took with me from this class.*
- *Sure. I already felt comfortable.*

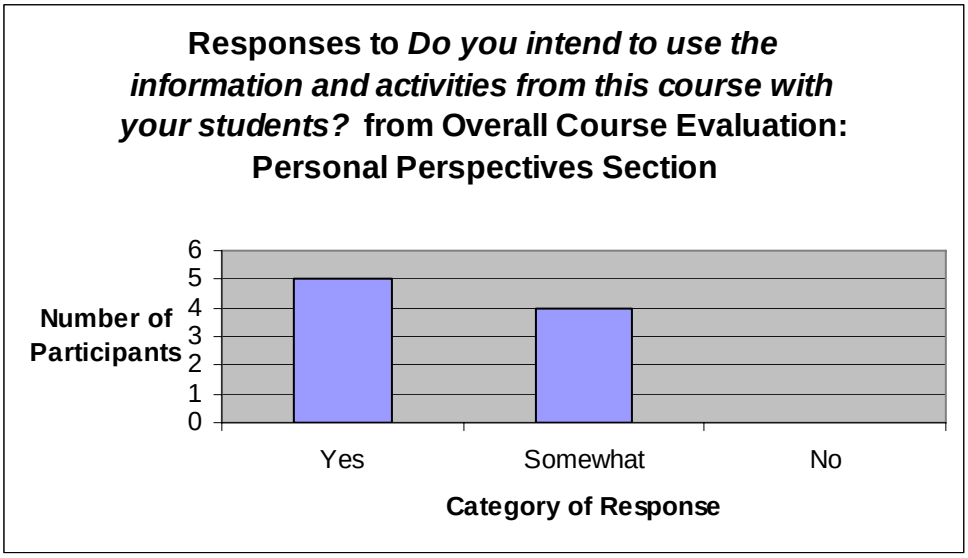
The No Category:

- *No, I was perfectly comfortable teaching outdoors.*

3. If you are an educator, do you intend to use the information and activities from this course with your students? Please explain.

The results indicate that 78% of participants who responded felt that they will use the information and activities with their students. The remaining 22% point out that they may use the information learned in *TAEO* in their own classrooms. These results are summarized in Figure 4.19.

Figure 4.19: Responses to *Do you intend to use the information and activities from this course with your students?* from Overall Course Evaluation: Personal Perspectives Section (n=9)



The Yes Category:

- *Yes, I love incorporating the outdoors. Now I have more ways to do that and meet different benchmarks.*
- *I will use some of the websites for some of my units.*

- *I plan on taking them out to do journaling and gardening in the courtyard. I plan on using sensory learning outdoors.*
- *I will infuse this information not only into my environmental science class by my 9th grade physical science class as well*
- *Yes, I have already made notes of activities that I will try this fall in my natural resources class. Journaling, the mapping idea, and hopefully we will visit the nature camp in Almond and go cross country skiing this winter.*
- *Yes. I got many new ideas from this course!*
- *Yes. Good ideas.*

The Somewhat Category:

- *I found a few ideas and activities that I liked. It also has me thinking about multiple intelligences.*
- *I will try to incorporate at least one additional activity this year in Biology. It's hard because we have a tight schedule and topics like human genetics don't lend themselves well to outdoor activities.*

There were no comments that fell into the No category.

Comments from other evaluations (such as Unit 1, 2, 3, and 4 surveys) that were also used as additional information in determining the value of *TAEO* include:

- *Very well done. I've had many online courses, and this format is quite user-friendly*
- *Non-computer savvy people can still figure it out – very good.*

- *I really liked the list of learning characteristics for 16-19 year olds.*
- *I liked that actual tests were included to find your own multiple intelligences and learning styles.*
- *I liked the phenology assignment very much. I'd like to incorporate phenology into my curriculum in the future.*
- *I felt inspired after working through this unit. It sparked me in wanting to use these topics throughout my upcoming year.*
- *I loved the exposure to different ways to use instruction outdoors. I'm definitely going to use some of these ideas this year!*
- *I really enjoyed the Head Outside assignment…it is fun to do something different!*
- *I enjoyed this lesson. I think when you make assignments applicable to a teacher's daily work, it makes sense!!*
- *I thought that it was a good eye-opener as a teacher, that just because you feel that you teach in a way YOU might understand, you still need to keep in mind that your students have multiple learning styles. A teacher needs to hit on a variety of strategies to accommodate all of his/her students.*
- *It made me reflect on my teaching and it brought new ideas to me on how to incorporate visual learning.*
- *This has been one of my more useful grad courses.*
- *Karla, I think overall this course has great value. I hope that it inspires more outdoor education within every classroom!*

See Appendices S, U, W, Y, AA, and CC for complete list of open-ended question responses.

CHAPTER FIVE

DISCUSSION OF RESULTS

I. Overview of Course Development

The aim of this study was to develop, pilot, and evaluate the one-credit UWSP online course *NRES 410/610: Teaching About the Environment Outdoors (TAEO).* The course was developed by first identifying goals and learner objectives, assembling curriculum and appropriate assignments, designing the homepage and D2L site and finally gaining approval from the researcher's graduate committee and university.

TAEO is a four-week, one-credit online class on practical strategies and activities for teaching about environmental-related topics in the outdoors. *TAEO* can be found on the internet at http://www.uwsp.edu/natres/nres610taeo/index.html . The content and

assignments are all found on the free web. The password protected website, D2L, is used exclusively by enrolled participants to chat on the discussion board, access grades, submit assignments and view the class list.

There are four units (one unit per week) that make up the content framework. Unit 1: Teacher and Learner Considerations provides background information on outdoor environmental education and shows how teaching outdoors can satisfy a variety of learning styles and multiple intelligences. Unit 2: Topics to Teach gives participants some ideas and knowledge on several environmental topics often taught outdoors. Unit 3: Strategies and Techniques examines eleven different ways to engage students in outdoor learning. Unit 4: Planning and Conducting OEE focuses on what to do with your students before, during, and after an outdoor excursion.

Because the course topic is outdoor environmental education, some may feel the method of online learning to be a contradiction. The researcher worked hard to create assignments that would encourage participants to leave their computer and try activities outdoors. Assignments for the four units did indeed show to be engaging and practical. Participant comments support this claim: *"I loved the exposure to different ways to use instruction outdoors. I'm definitely going to use some of these ideas this year!", "I really enjoyed the Head Outside assignment… it is fun to do something different!"* and *"This was a great Head Outside assignment. It is definitely something I could duplicate with my students."*

The course homepage and D2L site proved to be *"easy to follow"* and *"clear and understandable"* to participants in the course. By having similar components as other UWSP courses, continuing students did not run into any unexpected problems or surprises when navigating the course. Assistance from UWSP's IT department and CNR staff helped the course to be considered *"Very well done. I've had many online courses, and this format is quite user-friendly."*

II. Overview of the Pilot Course

NRES 410/610 Teaching About the Environment Outdoors was piloted July 30th-September 3rd, 2006 at UWSP through the College of Natural Resources. Ten K-12 licensed educators participated in the study. The participants were completed graduates, perspective, and current students of the WCEE's Extended Master's in EE program. There were three assignments for each unit. Participants had one week to complete and submit them to a password protected website (D2L). In addition to the course workload, participants were required to complete a pretest, posttest, five formative evaluations and a summative evaluation. In compensation for this extra work, the WCEE (specifically the GET and GEM programs) waived the tuition in the amount of one-graduate credit at UWSP (Summer 2006 rate).

The researcher was also the developer and instructor for the course. The main form of communication between instructor and participants was email. One participant commented, *"Communication was just as important in the learning process as the information provided."* Another avenue for communication was the discussion board. One student commented, *"The discussion board was a great way to share information."* Downloading some of the

attachments/links and uploading assignments was a challenge for one or two people. This could be due to their internet connection speed or internet service provider.

III. Interpretation of Evaluation Results

TAEO was evaluated according to three objectives:

3a. Measure statistical difference in knowledge obtained after having taken the course by administering a pretest-posttest

3b. Determine revisions to *NRES 410/610 Teaching About the Environment Outdoors* by evaluating course content, structure, design and technology.

3c. Assess the overall value of *NRES 410/610 Teaching About the Environment Outdoors* as a learning tool

A. Pretest-Posttest

The Pretest-Posttest design was chosen by the researcher to measure statistical difference in perceived knowledge about outdoor environmental education after having taken *NRES 410/610 Teaching About the Environment Outdoors.* This evaluation method was used to test the null hypothesis:

H_0: There is no increase in perceived knowledge regarding topics & techniques for outdoor environmental education after having completed *NRES 410/610 Teaching About the Environment Outdoors.*

The pretest and posttest results were determined in two ways; percent increase by test question and percent increase by individual.

Percent increase by test question:

On the pretest, there was only one question with a mean score lower than 3.0 which again meant that most students already felt somewhat or very knowledgeable about the topics. Even so, each question had an increased value on the posttest.

The topics with the least amount of change were those in section II: Outdoor Environmental Topics. The Section II *pretest* means were between 4.30 and 4.70 (with the exception of phenology that had a mean of 3.80). These means indicate that this audience was already very knowledgeable in environmental topics before taking *TAEO*. This result is most likely attributed to the fact that the participants in this study have many years of EE teaching experience. The Section II questions therefore showed the least amount of increase; between 2% and 6% (with the exception of phenology that increased 18%).

The section with the greatest increase was I: Teacher & Learner Considerations. Section I increased between 10% and 16%. The result may be due to the fact that many of the assignments throughout the entire course emphasized or related to the multiple intelligence theory and other learning styles. Sections III Teaching Strategies & Activities and IV Planning & Conducting OEE increased between 2% and 23%. The average increase in each section was 11.6% and 12% respectively. Among the questions that increased the most were *II.6 Phenology* (18%) and *III.10 Nature Journaling* (22%). These two topics were used as

assignments in Unit 2 and Unit 3. Therefore, the greatest increase seemed to be in areas where the participants were required to explore the content further and actually put it into practice or reflect on the readings in order to complete the assignment.

Percent increase by individual students:

The audience for this study had a great deal of EE background. Three students had over a decade of EE experience and half had six years or more. Therefore, it should be no surprise that over two-thirds of the student's pretest scores averaged above 4.0 which meant they already felt somewhat or very knowledgeable about the topics. Nonetheless, the results show that all ten students increased their knowledge on outdoor environmental education. The posttest showed that 90% of the students felt somewhat or very knowledgeable about the topics (4.0 or better) after having completed this online course.

t-Test

The means of all ten student pretests were collapsed and compared against all ten student collapsed posttest means. Therefore the data used for the t-test is the mean of the means of student responses to the pretest and posttest. Results indicate a significant difference in student performance between the pretest (M = 4.03, SD = .36) and the posttest (M = 4.56, SD = .57). The researcher found the t-value to be 2.94 which lies outside the +/-2.26 range for 9 degrees of freedom on the t-test table. See Appendix R for complete calculations. Because the calculated t-value falls outside the range, the researcher can say that the pretest and posttest results are statistically different.

Based on these results, *NRES 410/610 Teaching About the Environment Outdoors* did increase participant's perceived knowledge regarding topics and techniques for outdoor environmental education. Therefore, the researcher rejects the Null Hypothesis (H_0).

B. Course Revisions

TAEO was evaluated using five formative evaluations and one summative evaluation to help determine revisions to the course. The researcher implemented a formative evaluation for the course introductory pages and at the conclusion of each week-long unit in the pilot study. The summative evaluation was implemented after students had completed all required readings and assignments. These evaluation tools were used to gather information about course content, structure, design, and technology.

Likert Scale questions that were considered for revisions had a mean lower that 4.0 on a scale where 5.0 is the highest. Nine of the ten questions on the Unit 1, 2, 3, and 4 surveys were 4.0 or higher on the Likert Scale (out of 5.0). However, the results show that a fair amount of participants felt the recurring theme of learning styles and multiple intelligences was redundant. One or two participants felt that the unit assignments in Units 2, 3, and 4 were not clear and did not have specific instructions. Others felt that assignments were clear or very clear. All nine open-ended comments asking students to list one thing they liked about Unit 4 said the authenticity of the final assignment. Some comments did however, indicate that the final assignment was bad timing as it fell the week before public school started in many districts.

Overall, the comments were very positive and Likert Scale values ranged from 4.20 to 4.70 where 5.0 is the highest possible score. The average mean for this course structure was the highest of all sections in this overall course evaluation at 4.46

The revisions for the course were based on nearly 200 comments from course participants. Comments that were criticisms in nature were generally lumped into categories. The comments used to make the categories for suggested revisions to *TAEO* were found in at least two different surveys and had a frequency of three or more comments within the category. The categories include: Too many Links, Multiple Intelligences as a Theme, Check for Redundancy, and Wording of Assignments.

Too many links

Overall, the comments on course structure were very positive. If fact, course structure was the highest of all sections on the Overall Course Evaluation (M=4.46). There were however, comments on Unit 1, Unit 2 and Unit 3 evaluation surveys stating that a participant didn't like the amount of content for *TAEO* linked out to websites other than the course homepage. The course developer decided to use the websites because they were not limited to only a page of information. In Unit 2, for example, students were directed to the website "Phenology, the Study of Nature's Cycles of Life" found at http://sws-wis.com/lifecycles/. The homepage, "What is Phenology," and "How to Start" pages gave a great introduction to the whole concept. The researcher could have obtained permission to put this information directly on her website, or reworded it in a way that only quoted this website, however the other links found there, the public forum, and the phenology database would all go

undiscovered. If a participant had an interest in a topic such as phenology, this gave them a way to explore further. Because there were three comments on the formative evaluations pertaining to too many links, the researcher makes the following recommendation.

Recommendation: The instructor should take a look at ways to reduce the number of links and still maintain the quality of the course.

Multiple Intelligences as a Theme

The Multiple Intelligences (MI) theory was introduced in the first chapter. It was the intension of the instructor to show how outdoor education is a great way to accomplish the goals of the theory and keep it as a theme throughout the assignments in the course. There were, however, seven comments on different evaluations that indicated participants felt the MI theory was stressed too much. The comments that fall into this category were not in Unit 1, but in the following unit evaluation surveys. For example, *"Leave the multiple intelligences and learning styles in unit 1. The number of teaching subjects areas was enough to reflect on. The rehashing of the learning styles, etc. was redundant and unnecessary."* The researcher's concern, however, is that people may take the course with very little knowledge of the MI theory. *TAEO* provides the opportunity not only to learn about the theory, but to put it into practice.

As a result of the frequency of these comments, the researcher makes the following recommendation.

Recommendation: The instructor should discuss the assignments with a review committee. Adjustments may be made to reduce or eliminate the Multiple Intelligence theory as a theme throughout Unit 2, 3, and 4 assignments. Multiple Intelligence theory will not be eliminated from Unit 1 as there was over 50% of the class who indicated that they enjoyed that section.

Check for Redundancy

NRES 410/610: Teaching About the Environment Outdoors is a one credit-course. The intended audience for the pilot was graduates, perspective students and current students of the Extended Master's program. Half of the applicants for the pilot course were graduates or had over 15 UWSP graduate credits. The decision was made to select those with a large amount of EE background and experience to better evaluate the course. Those with more experience would have a more accurate understanding of the technology involved as well as the assumed knowledge of the goals of EE and some experience. Even though the pretest-posttest showed that each student increased their knowledge about outdoor environmental education as a result of *TAEO,* there were four comments on different evaluation surveys indicating that some individuals felt there was a degree of redundancy between *TAEO* and other graduate courses offered by the University.

- *[The course] was a review of much that I had already learned in the EE master's program at UWSP, but I did find some good resources to add to my collection. It seems like it would best fit early in the master's program or for someone who doesn't have experience with teaching EE or a great undergrad course.*

Likert scale question 5 on the Unit evaluation surveys also suggest there was some overlap in course material. Refer to Figures 4.5 and 4.8 for those results. Although it is not the intention of the researcher to include superfluous redundancy, some overlap in the content (pedagogy, topics, etc.) is necessary to give context for new material.

Furthermore, the audience for this pilot course was a narrow group of individuals who had similar backgrounds in EE. Future offerings of the course may include an audience with a wide variety of backgrounds and depth of experience in EE. In this case, a mild degree of overlap would be helpful to participants both in completing assignments and contributing to the online discussions.

As a result of the comments in this category, the researcher makes the following recommendation.

Recommendation: The instructor should review the course content of *TAEO* and compare it to other online courses offered by UWSP and the UW Continuing Ed checking for unnecessary redundancy.

Wording of Assignments

In the open-ended responses of the unit evaluations and summative evaluation, it was apparent that there was confusion on the wording of the assignments. The wording seemed to be a problem for two people in Units 2 and 3, and one person in Unit 4. However, the summative evaluation asked specifically to provide at least one recommendation for

improving the assignments. There were nine comments; all were different and none of them referred to the confusing wording of the assignments. When asked about things they liked about the course, six of the nine comments were about the different assignments. The remaining three were about the ease and asynchronous nature of a web-based class. Comments in the Course Content Section of the Overall Course Evaluation supported this conclusion as 80% of participants strongly agreed that the Head Outside assignments were helpful in advancing their learning. Only one individual thought the Head Outside assignments were not helpful. Nonetheless, there were five comments from three different surveys concerning the wording of assignments.

Therefore, as a result of these comments the researcher makes the following recommendation.

Recommendation: The instructor should revise the wording, but not change the goals of the assignments. As stated in the previous section, the multiple intelligence aspect in Units 2, 3, and 4 may be removed, but the idea of a Reading Reflection, Head Outside, and Online Discussion assignment should remain.

C. Course Value

The overall value of *TAEO* as a learning tool was assessed using the Personal Perspectives section of the Overall Course Evaluation survey and by open-ended comments on the various formative surveys.

Many of the questions in the personal perspectives section yielded a variety of answers. All participants were glad that the course was offered on the internet and over half would have most likely not commuted to a campus to take it face-to-face. All participants indicated they would participate in another online course as a result of their experience taking this course and 90% would recommend *NRES 410/610 Teaching About the Environment Outdoors* to others. Most thought the course workload was appropriate, although 20% thought it was too much for a one-credit graduate course. Open-ended comments such as "*The workload was appropriate for a one-credit class. It wasn't just read this and write a paper about it. It had real things we could use in our classroom."* and *"We actually had to move away from the computer to complete the assignments and go outside, just like the class suggests"* support this claim.

Of the ten course participants, 80% found *TAEO* to be valuable and 20% indicated the course was somewhat valuable. Other comments throughout the formative evaluations and summative evaluation support this.

- *I thought that it was a good eye-opener as a teacher, that just because you feel that you teach in a way YOU might understand, you still need to keep in mind that your students*

have multiple learning styles. A teacher needs to hit on a variety of strategies to accommodate all of his/her students.

- *It made me reflect on my teaching and it brought new ideas to me on how to incorporate visual learning.*
- *This has been one of my more useful grad courses.*
- *Karla, I think overall this course has great value. I hope that it inspires more outdoor education within every classroom!*

Participants were also asked questions specifically asking if they felt their confidence with teaching outdoor environmental education increased as a result of *TAEO.*

Of the ten course participants, 40% felt that their confidence did increase, 50% felt their confidence somewhat increased and 10% felt their confidence did not increase. When taking into account the fact that this group of ten individuals has a combined 84 years of EE experience, this result is not surprising. However, nine individuals (of the nine who responded to this question) indicated that they will use the information and activities they learned in *TAEO* in their classrooms. This demonstrates confidence in teaching environmental topics outdoors. Other comments throughout the formative and summative evaluations support this increase in confidence.

- *…it is definitely something I could duplicate with my students.*
- *It sparked in me wanting to use these topics throughout my upcoming year.*
- *I loved the exposure to different ways to use instruction outdoors. I'm definitely going to use some of these ideas this year!*

Based on these results, *NRES 410/610 Teaching About the Environment Outdoors* was perceived by participants as a valuable learning tool.

IV. Recommendations for *NRES 410/610: Teaching About the Environment Outdoors*

Richard Louv's book Last Child in the Woods: Saving our Children from Nature-Deficit Disorder inspired many parents and teachers to bring their students outdoors. It is an old idea revisited in this day and age of electronic frenzy. *TAEO* is meant as an introduction to the teaching techniques and activities that teachers (and parents) can do with their children outdoors. **It is the recommendation of this researcher that UWSP continue offering *NRES 410/610: Teaching About the Environment Outdoors* and promote the course to a wider audience.** Parents, grandparents, day care supervisors, as well as teachers have the responsibility and the privilege to show children the amazing outdoors. According to many of the comments, a strong EE knowledge base is not required for this course as it is an introduction to outdoor environmental education. Offer the course to undergraduate students in any education program, graduate students in EE, and also for a non-credit option.

The Global Environmental Teachings Program is connecting educators all over the world. It is the recommendation of this researcher that **this course be offered internationally to teachers as part of an exchange program** or as **partial fulfillment of a certificate in environmental education.**

The researcher recommends that a DVD be made to accompany the online course information. **A future project could include developing the DVD and re-piloting *TAEO* with the use of the DVD.** A DVD video gives participants another way of learning about outdoor environmental education (providing visual and audio stimuli) whereas information found on the internet is primarily visual.

The researcher also recommends that ***TAEO* be offered to undergraduate education and natural resource majors pursuing environmental education**. This may give undergraduates the preparation they need before entering into their practicum semester at the Central Wisconsin Environmental Station (CWES). Theory, topics, teaching techniques, and planning and preparation covered in *TAEO* are responsibilities of a practicum student at CWES. Some extra preparation may benefit both the student and the facility.

V. Recommendations for Future Research

As a result of this research in determining that this online course was indeed perceived as a valuable learning tool that increased participant knowledge, **this researcher recommends that the CNR develop, pilot, and evaluate more online courses specifically for environmental education and experiential teaching strategies and techniques**. Online courses have been shown to be a good learning tool for teachers. If the developer can somehow bridge the theory and experience through authentic assessments, teachers will be more likely to infuse environmental education into their curriculum.

Recommendations for future research of *TAEO* would include **using an audience with very little knowledge of EE** but still having an interest in the outdoors. **It is also recommended that the researcher use a True-Experimental Pretest-Posttest Control Group Design** and that he or she select from the applicant pool at random. This would increase the validity of the experiment and present more generalized results.

Another recommendation for future research could include **a survey to past course participants inquiring about whether they are actually using the resources and activities from *NRES 410/610: Teaching About the Environment Outdoors* in their classrooms or taking their students out more frequently for outdoor lessons.** It might also be beneficial to know which resources and activities are being used the most by different age groups.

References Cited

Adkins, Carol and Bora Simmons. [2003] *Outdoor, Experiential, and Environmental Education: Converging or Diverging Approaches?* ERIC Digest. November 2004. <http://www.ericdigests.org/2003-2/outdoor.html>

Armstrong, Thomas. [1994] Multiple Intelligences in the Classroom. Association for Supervision and Curriculum Development. Alexandria, VA

Barnett, Harvey [2003] *Technology Professional Development: Successful Strategies for Teacher Change.* ERIC Clearinghouse on Information and Technology: Syracuse, NY. ERIC Identifier: ED477616

Berman, Dene and Jennifer Davis-Berman [1995] *Outdoor Education and Troubled Youth.* ERIC Clearinghouse on Rural Education and Small Schools: Charlestown, WV. ERIC Identifier: ED395425

Boston, Carol. [2002] *The Concept of Formative Assessment.* ERIC Clearinghouse on Assessment and Evaluation: College Park, MD. ERIC Identifier: ED470206

Canning-Wilson [2000] *E-learning with the E-teacher: Considerations for On-line Course Design.* Center for Excellence in Applied Research and Technology. CERT College.

Carr, S. [2000]. *As distance education comes of age, the challenge is keeping the students.* The Chronicle of Higher Education, 46 (23), A39-A41.

Crimmel, Hal [2003] *Teaching in the Field.* The University of Utah Press: Salt Lake City, UT

Dewey, J. [1938] *Experience and education*. NY Collier Books: New York City, NY

Disinger, John F. [1983] *Field Instruction in School Settings.* ERIC Clearinghouse for Science Mathematics and Environmental Education: Columbus OH. ERIC Identifier: ED25993

Donaldson, G. E., & Donaldson, L. E. [1958]. *Outdoor education: A definition.* Journal of Health, Physical Education and Recreation, 29(17), 63.

Draves, William. [2000] Teaching Online. LERN Books. River Falls, WI

EETAP [2004] Environmental Education Training and Partnership. November 2004. <http://eetap.org>

Felder, Richard [1996] *Matters of Style.* ASEE Prism 6 (4) December 1996. North Carolina State University, NC.

Ford, Phyllis. [1986] *Outdoor Education: Definition and Philosophy*. ERIC Clearinghouse on Rural Education and Small Schools: La Cruces, NM. ERIC Identifier: ED267941

GET. [2004] Global Environmental Teachings. September 2004. <http://www.uwsp.edu/get>

Hammerman, Donald, William Hammerman, and Elizabeth Hammerman. [1985] *TEACHING IN THE OUTDOORS*, 3rd edition. Interstate Printers and Publishers: Danville, IL

Haury, David & Peter Rillero. [1994] *Perspectives of Hands-on Science Teaching.* The ERIC Clearinghouse for Science, Mathematics and Environmental Education: Columbus, OH

Howe, Robert and John Disinger. [1988] *Teaching Environmental Education Using Out-of-School Settings and Mass Media Source*. ERIC Clearinghouse for Science Mathematics and Environmental Education: Columbus, OH. ERIC Identifier: ED320759

Howe, R. W., Blosser, P. E., Helgeson, S. L. & Warren, C. R. [1990] *Trends and issues in science education: Curriculum and instruction.* Columbus, OH: ERIC Clearinghouse for Science, Mathematics, and Environmental Education. ERIC Identifier ED335236

Hungerford, Harold. [19--] *Myths of Environmental Education.* Essential Readings in Environmental Education.

Hutinger, Patricia. [2004] *Learning Modalities: Pathways to Effective Learning.* The Issues: Learning Modalities. November 2004. <http://www.pbs.org/teachersource/prek2/issues/1101issu.shtm>

Jarrett, Olga S. [2003] *Recess in Elementary School: What does Research Say?* ERIC Digest. November 2004. <http://www.ericdigests.org/2003-2/recess.html>

Johnson, Scott & Steven Aragon. [2000] *An Instructional Strategy Framework for Online Learning Environments.* University of Illinois, IL.

Kerka, Sandra. [1997] *Distance Learning, the Internet, and the World Wide Web.* ERIC Digest. November 2004. <http://www.ericdigests.org/1997-1/distance.html>

Knapp, Clifford. [1992] *Thinking in Outdoor Inquiry*. ERIC Clearinghouse on Rural Education and Small Schools: Charleston WV. ERIC Identifier: ED348198

Kolb, David A. [1984] Experiential Learning: Experience as the Source of Learning and Development. New York: Prentice-Hall.

Lane, Jennie, Rick Wilke, Daniel Sivek, Randy Champeau. [1995] *Strengths and Weaknesses of Teacher Environmental Education Preparation in Wisconsin.* Journal of Environmental Education, 27:1. (EJ 528323)

Lappin, Edward. [1984] *Outdoor Education for Behavior Disordered Students.* ERIC Clearinghouse on Rural Education and Small Schools Las Cruces NM. ERIC Identifier: ED261811

Learning Curve, The. [2004] *Learning Modalities*. November 2004. <http://library.thinkquest.org/C005704/content_hwl_learningmodalities.php3>

Leedy, Paul. [1993] *Practical Research: Planning and Design 5th edition.* MacMillan Publishing Company, NY.

Louv, Richard. [2005] *Last Child in the Woods: Saving our Children from Nature-Deficit Disorder.* Algonquin Books of Chapel Hill, Chapel Hill, NC.

Mattano, Rebecca [2005] *The Development and Evaluation of a K-12 Land Use Environmental Education Conceptural Guide and On-line Course.* Master's Thesis. University of Wisconsin-Stevens Point: Stevens Point, WI

McGreal, Rory. [1997] *The Internet: A Learning Environment.* New Directions for Teaching and Learning, 71, 67-74

McKeown-Ice, R. [2000] *Environmental Education in the United States: A Survey of Preservice Teacher Education Programs.* Journal of Environmental Education. 32 (1): 4-11

Meyer, Maggie. [1998] *Teaching and Learning through the Naturalist Intelligence.* New Horizons. April 2006. <http://www.newhorizons.org/strategies/environmental/meyer.htm>

Passmore, J. [1972] *Outdoor Education in Canada*. Ontario Institute for Educational Studies. Toronto, Ontario, Canada

Regnier, Kathleen, Michael Gross, and Ron Zimmerman. [1994] *The Interpreter's Guidebook: Techniques for Programs and Presentations.* 3rd Edition. UWSP Foundation Press: Stevens Point, WI

Rivkin, Mary S. [2000] *Outdoor Experiences for Young Children.* ERIC Clearinghouse on Rural Education and Small Schools. ERIC Digest. November 2006. <http://www.ael.org/page.htm?&id=237&pd=99&scope=oe&pub=x >

Rovai, Alfred P. [2002] *Building a Sense of Community at a Distance.* International Review of Research in Open and Distance Learning. School of Education. Regent University, VA. ISSN: 1492-3831

Simmons, Bora. [1998] *Using Natural Settings for Environmental Education: Perceived Benefits and Barriers.* Journal of Environmental Education. Spring98, Vol. 29 Issue 3

Sharp, L. B. [1943] Outside the classroom. The Educational Forum, 7(4), 361-368.

Sherry, L. [1996] Issues in Distance Learning. *International Journal of Educational Telecommunications, 1* (4), 337-365.

Smith, Glenn Gordon, David Ferguson, Caris Mieke. [2001] *Teaching College Courses Online vs. Face-to-Face.* November 2006. <http://www.thejournal.com/magazine/vault/articleprintversion.cfm?aid=3407>

UNESCO Tbilisi Declaration. [1977] Final report: Intergovernmental Conference on Environmental Education: Tbilisi, USSR. 14-16 October 1977

Tilden, Freeman. [1957] Interpreting our Heritage. Chapel Hill: University of North Carolina Press: NC

Wilcox, Sarah. [2004] *Summative Evaluations and Resulting Revisions of an Online Course entitled Fundamentals of Environmental Education.* Master's Thesis. University of Wisconsin-Stevens Point: Stevens Point, WI

Willis, Barry. [1992] *Instructional Development for Distance Education.* ERIC Clearinghouse on Information Resources Syracuse NY. ERIC Identifier: ED351007

Wilson, Leslie. [1998] *The Eighth Intelligence: Naturalistic Intelligence.* Journeys: Inside Out, Outside In. Zephyr Press. Tucson, AZ

WCEE. [2004] Wisconsin Center for Environmental Education. September 2004. <http://www.uwsp.edu/cnr/wcee>

WDPI. [2004] Wisconsin Department of Public Instruction. November 2004. <http://www.dpi.state.wi.us >

Williams, M.L., K. Paprock, and B. Covington. [1999] *Distance Learning: The Essential Guide.* Sage Publications Inc. Thousand Oaks, CA

Zbleski, Bobbi. [2001] *The Development, Implementation, and Evaluation of a One-credit, Undergraduate/Graduate Level On-line Course titled NRES 358/558 Biodiversity and Conservation Biology.* Master's Thesis. University of Wisconsin-Stevens Point: Stevens Point, WI

APPENDIX A
***TAEO* LIST OF LINKS AND REFERENCES**

Links & References

Unit 1:

References:

Adkins, Carol and Bora Simmons. [2003] Outdoor, Experiential, and Environmental Education: Converging or Diverging Approaches? ERIC Digest. November 2004. <http://www.ericdigests.org/2003-2/outdoor.html>

Armstrong, Thomas. [1998/2006]. "Multiple Intelligences – An overview." February 2006. <http://www.thomasarmstrong.com/multiple_intelligences.htm>

Bowden, Marcia. [1989] Nature for the Very Young. John Wiley & Sons, Inc. New York.

Carlson, Steve & Carrie Hartz. [2002] Exploring your Environment: Helper's Guide. Regents of Minnesota. St. Paul, MN.

Donaldson, G. E., & Donaldson, L. E. [1958] Outdoor education: A definition. Journal of Health, Physical Education and Recreation, 29(17), 63.

Ford, Phyllis. [1986] Outdoor Education: Definition and Philosophy. ERIC Clearinghouse on Rural Education and Small Schools: La Cruces, NM. ERIC Identifier: ED267941

Hoffman, Kate. [2004] Nature Journaling: A Creative Path to Environmental Literacy. Stevens Point, WI

Hutinger, Patricia. [2004] Learning Modalities: Pathways to Effective Learning. The Issues: Learning Modalities. November 2004. <http://www.pbs.org/teachersource/prek2/issues/1101issu.shtm>

Lappin, Edward. [1984] Outdoor Education for Behavior Disordered Students. ERIC Clearinghouse on Rural Education and Small Schools Las Cruces NM. ERIC Identifier: ED261811

Learning Curve, The. [2004] *Learning Modalities.* November 2004. <http://library.thinkquest.org/C005704/content_hwl_learningmodalities.php3>

Passmore, J. [1972] Outdoor Education in Canada. Ontario Institute for Educational Studies. Toronto, Ontario, Canada

Sharp, L. B. [1943] Outside the classroom. The Educational Forum, 7(4), 361-368.

Sivek, D. J. [2002] Environmental sensitivity among Wisconsin high school students. Environmental Education Research, 8(2), 155-170

Links:
Multiple Intelligences Self-Quiz. March 2006.
<http://ddl.dyc.edu/~hsa/learningstylesmar7.htm>

Simmons, Deborah and Michelle Richardson. 1996. "Recommended Competencies for Outdoor Educators." November 2004. <http://www.ericdigests.org/1996-3/outdoor.htm>

VARK learning modalities test. March 2006. http://www.vark-learn.com/english/index.asp

WEAC Convention. [1997] Howard Gardner, Keynote Speaker. February 2006.
<http://www.weac.org/aboutwea/conven97/audio1.htm>

Unit 2

References:

Almeras, B. G., David Heath [2001] Access Nature. National Wildlife Federation

Blocksma, Mary. [1992] *Naming Nature: A Seasonal Guide for the Amateur Naturalist.* Penguin Books, NY

Carlson, Steve & Carrie Hartz. [2002] *Exploring your Environment: Helper's Guide*. St. Paul, MN, Regents of Minnesota.

Carson, Rachel. [1956] The Sense of Wonder. New York: Harper & Row

Commoner, Barry. [2006] A lecture based on The Closing Circle. April 2006.
<http://classweb.gmu.edu/erodger1/prls533/Welcome/Commoner.PDF>

Goodall, Jane. [1990] Through a Window: My Thirty Years with the Chimpanzees of Gombe. London: George Weidenfeld & Nicolson

Hammerman, D. R., Hammerman, W. M., & Hammerman, E. L. [2001] *Teaching in the Outdoors, 5th edition*. Danville, IL: Interstate Publishers.

Leopold, Aldo. [1977] *A Sand County Almanac*. Madison, WI: Tamarack Press

Louv, Richard. [2005] *Last Child in the Woods.* New York, NY: Algonquin Books of Chapel Hill

Webster's II New Riverside Dictionary. [1996] Boston, MA: Houghton Mifflin Company

Links:

All About Birds. [2006] Cornell University Online Field Guide. March 2006.
<http://www.birds.cornell.edu/programs/AllAboutBirds/BirdGuide/>

Biodiversity Institute [2006] April 2006. <http://www.bdi.org/>

The Butterfly Lab. Peggy Notebaert Nature Museum. April 2006. <http://www.chias.org/online/thebutterflylab/fieldguide/native.html>

E-Nature Online Field Guide. March 2006. <http://www.enature.com/home/>

Folstad, Jason, Kate Hofmann, & Joe Heimlich. [2002] Environmental Education and Sustainable Development: Concepts for Sustainability. March 2006. <http://eelink.net/eetap/info108.pdf>

Guide to Freshwater Invertebrates. King County Regional Water Quality Block Grant. June 2006. <http://www.seanet.com/~leska/Online/Guide.html>

K-12 Energy Education Project Publications. University of Wisconsin – Stevens Point. March 2006. <http://www.uwsp.edu/cnr/wcee/keep/Resources/Publications/ElementarySupplement/ElementarySupplement.htm>

Kriesberg, Daniel. [2000] *A Sense of Place*. BookLinks. April 2006. <http://www.ala.org/ala/booklinksbucket/senseplace.htm>

Online Field Guide for Reptiles & Amphibians. New Jersey Fish & Wildlife Service. March 2006. <http://www.njfishandwildlife.com/ensp/fieldguide_herps.htm>

Orr, David. [2006] *A Sense of Wonder.* Ecoliteracy. April 2006. <http://www.ecoliteracy.org/pdf/wonder.pdf>

Phenology, The Study Of Nature's Cycles Of Life. March 2006. <http://sws-wis.com/lifecycles/>

Reed, David, Wm. [2006] *Plant Taxonomy & How to Identify Plants.* Texas A & M University. May 2006. <http://generalhorticulture.tamu.edu/YouthAdventureProgram/Taxonomy/Taxonomy.html>

Zoological Society Website. March 2006. <http://www.zoosociety.org>

Unit 3:

References:

Hammerman, D. R., Hammerman, W. M., & Hammerman, E. L. [2001] Teaching in the Outdoors, 5th edition. Danville, IL: Interstate Publishers.

Hoffman, Kate. [2004] Nature Journaling: A Creative Path to Environmental Literacy. Stevens Point, WI

Links:

Canadian Parks and Wilderness Society. March 2006. <http://cpawscalgary.org/education/topics/index.html>

Composting. Cornell University. March 2006. <http://ei.cornell.edu/biodeg/composting/>

EE-Link. November 2004. <http://eelink.net/pages/Teachers>

EE-Link. *School Gardens*. March 2006. <http://eelink.net/pages/EE+Activities+-+School+Gardens>

EEK Teacher Pages. Wisconsin Department of Natural Resources. March 2006. <http://dnr.wi.gov/org/caer/ce/eek/teacher/index.htm>

Environmental Education and Biology. Fun Science Gallery. March 2006. <http://www.funsci.com/fun3_en/exper1/exper1.htm>

EPA Curriculum Resources. March 2006. <http://www.epa.gov/teachers/teachresources.htm>

Five-Minute Field Trips. [2002]Global, Environmental & Outdoor Education Council. March 2006. <http://www.geoec.org/lessons/5min-fieldtrips.pdf>

Global Environmental & Outdoor Education Council. General Lessons. March 2006. <http://www.geoec.org/lessons/>

Global Learning and Observations to Benefit the Environment Program. June 2006. <http://www.globe.gov/globe_flash.html>

Hoherz, Brianne, Joe Heimlich & Liz Barringer-Smith. [2002] *Using Field Trips for Educational Outcomes*. EETAP Info Sheet. May 2006. http://eelink.net/eetap/info100.PDF

Introduction to Role-Play. Carlton College. March 2006. <http://serc.carleton.edu/introgeo/roleplaying/index.html>

Moon Related Links: NASA <http://nssdc.gsfc.nasa.gov/photo_gallery/> and In Constant Moon <http://www.inconstantmoon.com/>

Nature. Wisconsin Public Television. March 2006. <http://www.pbs.org/wnet/nature/teach.html>

Nature Net. Wisconsin Nature and Environmental Center Directory. May 2006. <http://www.naturenet.com/directory.asp>

Project WILD Sample Activity "Oh Deer." Colorado Division of Wildlife. March 2006. <http://wildlife.state.co.us/Education/TeacherResources/ProjectWild/OhDeer.htm>

Storytelling for the Environment: Module 4. Griffith University Department of Environmental Sciences. April 2006. <http://www.ens.gu.edu.au/ciree/LSE/mod4.htm#res1>

UW-Extension. Upham Woods 4-H Environmental Education Center. *Bat Program*. March 2006. <http://4h.uwex.edu/uphamwoods/programs/documents/bat.pdf>

Unit 4:

References:

Almeras, B. G., David Heath [2001] Access Nature. National Wildlife Federation

Bowden, Marcia. [1989] Nature for the Very Young. John Wiley & Sons, Inc. New York.

Carlson, Steve & Carrie Hartz. [2002] Exploring your Environment: Helper's Guide. St. Paul, MN, Regents of Minnesota.

Knapp, Clifford E. [1996] Just Beyond the Classroom Clearinghouse on Education and Rural Schools. Charleston, WV

University of Wisconsin – Stevens Point. Central Wisconsin Environmental Station Website. March 2006. <http://www.uwsp.edu/cnr/cwes>

Links:

American Lyme Disease Foundation Website. March 2006.<http://www.aldf.com/>

Ellison, Launa. *The Goal is Excellence*. New Horizons to Learning. February 2006. <http://www.newhorizons.org/strategies/assess/ellison.htm>

Kids Health. March 2006. <http://kidshealth.org/Features.jsp?lic=1&feature=100>

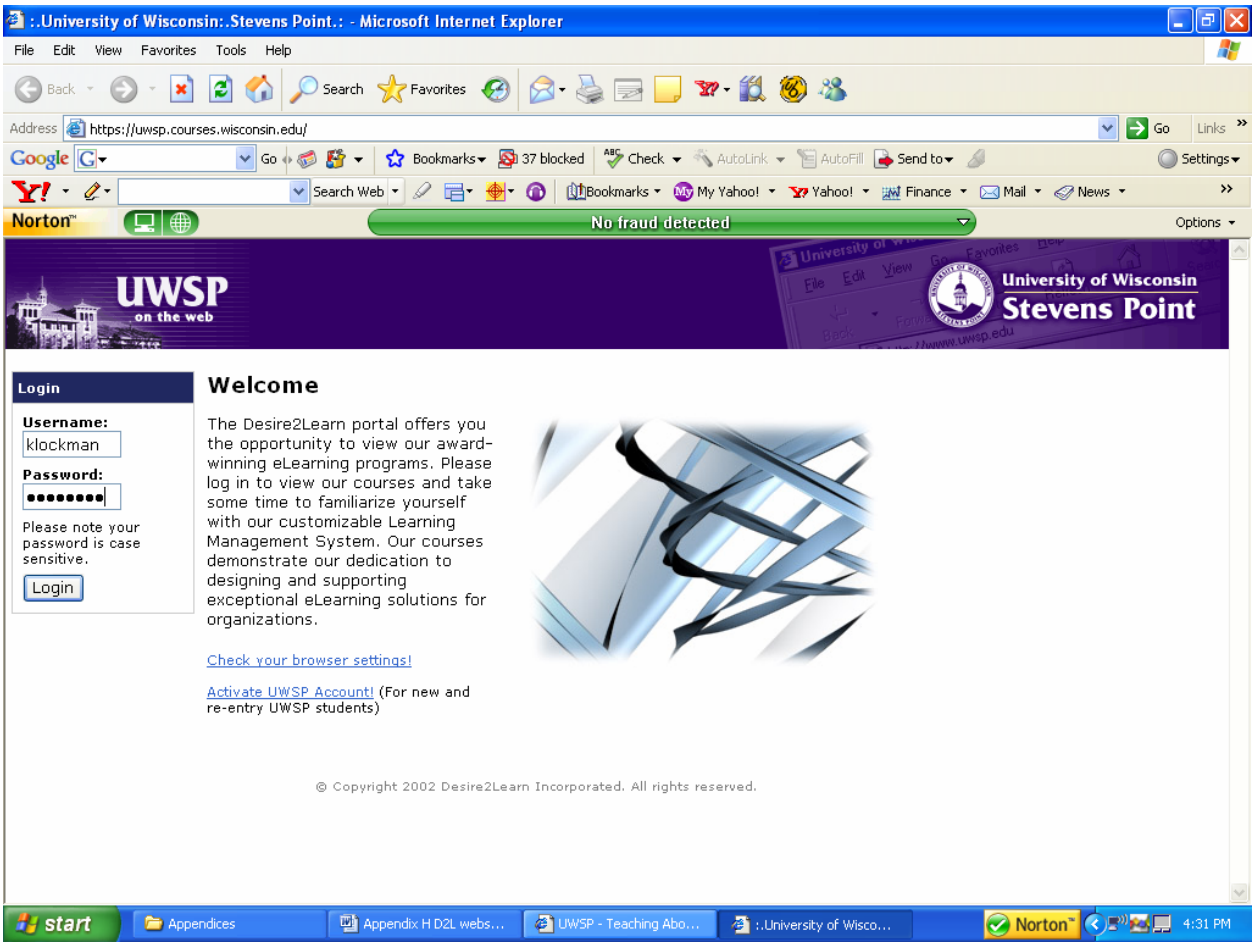
Meyer, Maggie & Glock Jennifer. *Learning Celebrations are Authentic Assessments of Student Understanding.* New Horizons to Learning. February 2006. <http://www.newhorizons.org/strategies/assess/meyer_glock.htm>

New Horizons to Learning. February 2006. <http://www.newhorizons.org/>

Poison Ivy Organization. March 2006. <http://www.poison-ivy.org/>

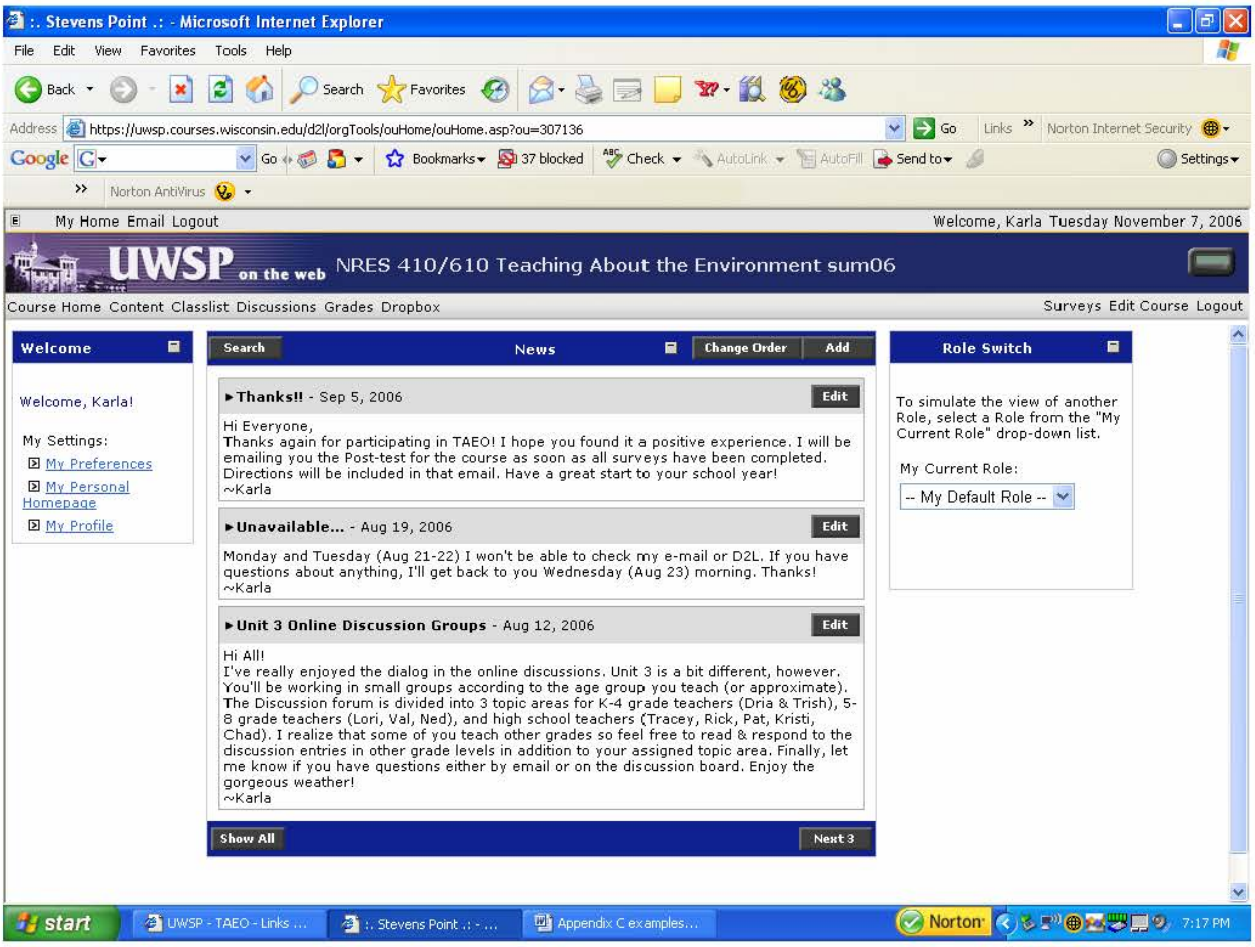
APPENDIX B
TAEO DESIRE2LEARN WEBSITE

D2L Log-on Webpage



https://uwsp.courses.wisconsin.edu/

TAEO D2L Course Home



APPENDIX C
E-MAIL TO SELECTED *TAEO* PARTICIPANTS 6.30.06

Greetings!
You have been selected to participate in UW-Steven Point's newest online course *NRES 610 Teaching About the Environment Outdoors (TAEO)*. The course officially begins July 30th and runs through August 26th. Because this is a pilot course, you will be asked to complete surveys on the introductory webpages, each of the four units, overall course, and pre- and post-tests. The surveys and pre/post-test are separate from the course and will in no way affect your grade. For your extra time & effort in helping to evaluate the course, you will receive on UW-SP graduate credit for *free*. In the next couple weeks you will electronically receive a course information packet. In the meantime, if you have any questions about the course, please send me an email.

Please reply to this email to confirm your enrollment for *NRES 610 TAEO* and please answer the following four questions.

1. What grade(s) & subject(s) do you teach?

2. How many online courses have you taken with UW-SP?

3. How long have you been doing environmental education?

4. How many times (per semester) do you take your students outdoors for learning activities?

Thank you for your time and I look forward to getting to know you all.

Karla L. Lockman
Graduate Assistant
Wisconsin Center for Environmental Education
TAEO Course Instructor
UW-Stevens Point
Home: (920) 596-2687
klock091@uwsp.edu

APPENDIX D
TAEO PRETEST AND POSTTEST

NRES 610 Special Topics in Environmental Education:
Teaching About the Environment Outdoors (TAEO)

Pretest-Posttest

This assessment is only for the purpose of evaluating the online course and will not influence or affect your grade in any way. After completing the Assessment, please submit to the D2L dropbox. Thank you.

I. On a scale of 1-5 rate your knowledge of the following **teacher and learner considerations**.

	5 Very Knowledgeable	**4 Somewhat Knowledgeable**	**3 Neutral**	**2 Little Knowledge**	**1 No Knowledge**
What is Outdoor Environmental Education (OEE)?					
Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE					
Teaching and learning styles					
Environmental sensitivity					

II. On a scale of 1-5 rate your knowledge of the following **outdoor environmental topics**.

	5 Very Knowledgeable	**4 Somewhat Knowledgeable**	**3 Neutral**	**2 Little Knowledge**	**1 No Knowledge**
Ecological Foundations such as…					
Adaptations					
Habitats					
Four Elements of Life (sun, air, water & soil)					
Life's Interconnections					
Energy Flow (i.e. food chain)					
Phenology (cycles)					
Sustainability					
Please list other outdoor environmental education topics you can think of.					

III. On a scale of 1-5 rate your knowledge of the following outdoor environmental education **teaching strategies and activities**.

	5 Very Knowledgeable	**4 Somewhat Knowledgeable**	**3 Neutral**	**2 Little Knowledge**	**1 No Knowledge**
Leading a hike					
Storytelling					
Creative drama					
Sensory learning					
Experiments					
Games					
Simulation					
Data Collection					
Gardening					
Nature Journaling					
Scavenger Hunts					
Field Trips					
Please list other outdoor environmental education strategies or activities you can think of.					

IV. On a scale of 1-5 rate your knowledge in **planning and conducting** outdoor environmental education programs.

	5 Very Knowledgeable	**4 Somewhat Knowledgeable**	**3 Neutral**	**2 Little Knowledge**	**1 No Knowledge**
Resources and activity guides for OEE activities					
Internet websites on the topic of OEE					
Please list major considerations for planning and conducting programs about the environment in the outdoors.					

APPENDIX E
COURSE INTRODUCTORY PAGES EVALUATION SURVEY

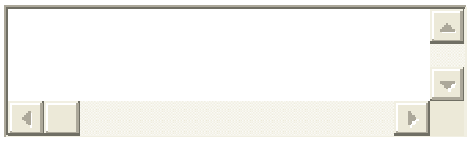
Course Introductory Pages

Complete this evaluation after reviewing the course introductory pages and submit by September 9th.

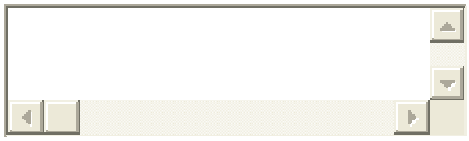
To what extent do you agree or disagree with the following statements...

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The Course Homepage generates an interest to investigate the course further.	☐	☐	☐	☐	☐
The Course Goals & Objectives were clearly stated.	☐	☐	☐	☐	☐
The Course Syllabus page gave you enough information regarding course content, unit descriptions and unit timeline.	☐	☐	☐	☐	☐
The Assignments page included all the necessary information about Head Outside, Reading Reflection, & Online Discussion assignments.	☐	☐	☐	☐	☐
The Instructor Information page gave necessary instructor qualifications and helped to personalize the course.	☐	☐	☐	☐	☐
The Computer Requirements page was understandable and informational.	☐	☐	☐	☐	☐
The Links page was helpful and organized appropriately.	☐	☐	☐	☐	☐
Instructions for the Course Evaluations were understandable.	☐	☐	☐	☐	☐
Logging into D2L was no problem at all.	☐	☐	☐	☐	☐
I was able to locate and access the online discussion board.	☐	☐	☐	☐	☐
I was able to locate and access the dropbox.	☐	☐	☐	☐	☐

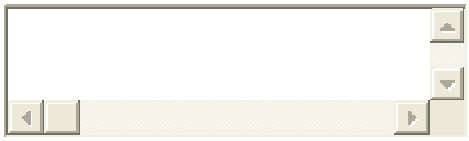
Comments on overall Course Introductory Pages:



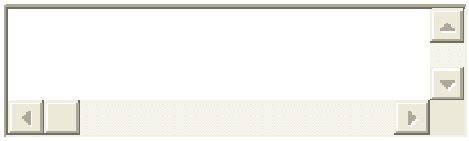
Comments on Course Goals & Objectives page:



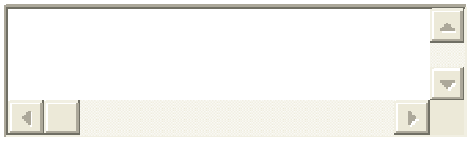
Comments on Course Syllabus page:



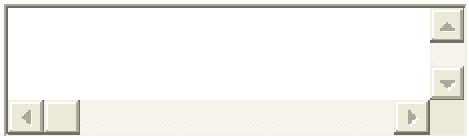
Comments on Assignments page:



Comments on Instructor Information page:

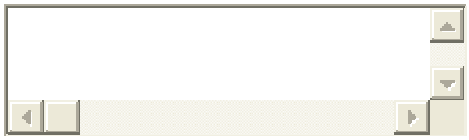


Comments on Computer Requirements page:

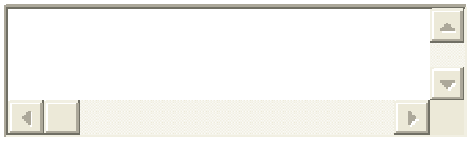


Comments on Links page:

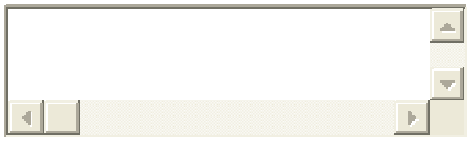
Comments on logging into D2L:



Comments on locating and accessing the online discussion board:



Comments on locating and accessing the dropbox:



Thank you for your time & effort in completing this course evaluation.

APPENDIX F
UNITS 1-4 EVALUATION SURVEYS
EXAMPLE OF UNIT EVALUATION SURVEY

Unit Evaluation

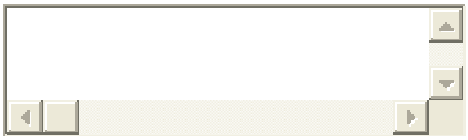
Complete this evaluation after you have completed Unit 1 and no later than August 12th, 2006.

To what extent do you agree or disagree with the following statements...

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
Unit goals and objectives were clear.	☐	☐	☐	☐	☐
The unit readings helped to achieve the course goals and objectives.	☐	☐	☐	☐	☐
The unit material was understandable.	☐	☐	☐	☐	☐
The unit material was relevant to outdoor environmental education.	☐	☐	☐	☐	☐
The unit material was redundant.	☐	☐	☐	☐	☐
The unit assignments were clear and had specific instructions.	☐	☐	☐	☐	☐
The unit was easy to navigate through.	☐	☐	☐	☐	☐
The unit links all worked properly.	☐	☐	☐	☐	☐
The directions for the required readings and assignments were clear.	☐	☐	☐	☐	☐
The unit progressed in logical order.	☐	☐	☐	☐	☐

Please list at least one thing you liked about the unit.

Please list at least one thing you disliked about the unit.



Additional Comments:

Thank you for your time & effort in evaluating Unit 1.

APPENDIX G
OVERALL COURSE EVALUATION SURVEY

Overall Course Evaluation

Complete this evaluation after finishing the entire course and no later than September 9th, 2006.

DESIGN & TECHNOLOGY
To what extent were you able to... [1=Very Unsuccessful 2=Somewhat Unsuccessful 3=Neutral 4=Somewhat Successful 5=Very Successful]

	1	2	3	4	5
Navigate the course website?	☐	☐	☐	☐	☐
Access the required readings?	☐	☐	☐	☐	☐
Use email to communicate with the instructor?	☐	☐	☐	☐	☐
Use the discussion bard to communicate with other participants?	☐	☐	☐	☐	☐
Use the D2L site to upload your assignments and complete evaluations?	☐	☐	☐	☐	☐
Download attachments, links, graphics, and audio in a reasonable time (20 seconds or less)?	☐	☐	☐	☐	☐
Download the course webpage in a reasonable time (20 seconds or less)?	☐	☐	☐	☐	☐

Comments on Course Design & Technology:

COURSE CONTENT
To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The content provided me with factual information.	☐	☐	☐	☐	☐
The content used examples that helped me understand the information.	☐	☐	☐	☐	☐
The course presented me with new outdoor environmental education resources via the Internet.	☐	☐	☐	☐	☐
I am more comfortable finding outdoor environmental education resources after taking this course.	☐	☐	☐	☐	☐
The Head Outside assignments were helpful in advancing my learning.	☐	☐	☐	☐	☐
The Reading Reflection assignments were helpful in advancing my learning.	☐	☐	☐	☐	☐
The Online Discussion assignments were helpful in advancing my learning.	☐	☐	☐	☐	☐
The instructions for the assignments were clear.	☐	☐	☐	☐	☐
The discussion board was helpful.	☐	☐	☐	☐	☐
There are obvious gaps in the course content.	☐	☐	☐	☐	☐

Comments on Course Content:

COURSE STRUCTURE
To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
The design and layout of the course was attractive and easy to follow.	☐	☐	☐	☐	☐
The grading procedure was clearly defined to me.	☐	☐	☐	☐	☐
The units progressed in a logical order	☐	☐	☐	☐	☐
The organization of the course was appropriate.	☐	☐	☐	☐	☐
The course material seemed to flow logically.	☐	☐	☐	☐	☐
There seemed to be sufficient interaction between the students.	☐	☐	☐	☐	☐
There seemed to be sufficient interaction between the students and the instructor.	☐	☐	☐	☐	☐

Comments on Course Structure:

PERSONAL PERSPECTIVES
To what extent do you agree or disagree with the following statements?

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I am glad that this course was offered online.	☐	☐	☐	☐	☐
If this course had not been offered online, I would have commuted to a campus to take it in a classroom.	☐	☐	☐	☐	☐
I think I learned as much in this course as I would have if I had taken it in a classroom.	☐	☐	☐	☐	☐
I would participate in another online course as a result of this experience.	☐	☐	☐	☐	☐
I would recommend this course to others.	☐	☐	☐	☐	☐
The course workload was appropriate.	☐	☐	☐	☐	☐
The depth and breadth of topics was adequate for a one-credit graduate course.	☐	☐	☐	☐	☐

Comments on Personal Perspectives:

Approximately how much time did you spend logged onto the internet for this course?

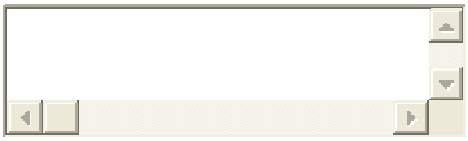
- ☐ 10 hours or less
- ☐ 11 - 20 hours
- ☐ 21 - 30 hours
- ☐ 31 - 40 hours
- ☐ 41 hours or more

Approximately how many total hours did you spend working on this course?

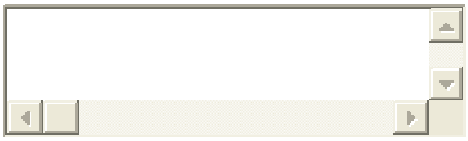
What is your current occupation (check all that apply)

- [ ] K-4 grade teacher
- [ ] 5-8 grade teacher
- [ ] 9-12 grade teacher
- [ ] Graduate student
- [ ] Environmental educator
- [ ] Outdoor educator
- [ ] Other

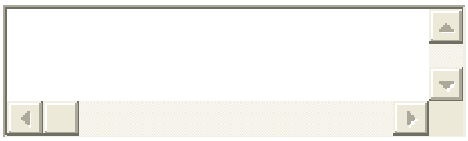
Did you find this course valuable? Please explain.



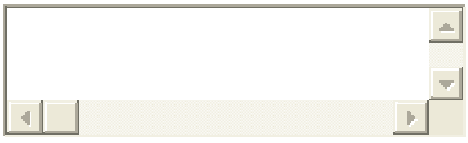
Do you feel your confidence with teaching outdoors has increased as a result of this course? Please explain.



If you are an educator, do you intend to use the information and activities from this course with your students? Please explain.

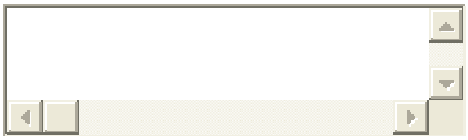


Please list at least one thing you liked about this course.

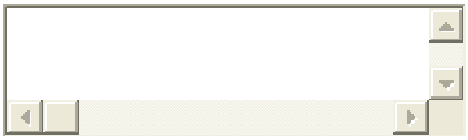


Please list at least one recommendation for improving the course or instructional materials.

Please provide at least one recommendation for improving the assignments.



Additional Comments:



Thank you for your time and effort evaluating TAEO.

APPENDIX H
***TAEO* ASSIGNMENT DESCRIPTIONS AND UNIT ASSIGNMENTS**

TAEO Assignments

All assignments must be completed and submitted to the secured D2L drop box or online discussion board by midnight Saturday unless otherwise noted.

There are three types of assignments used to evaluate learners' perceived increase in knowledge and skills when teaching about the environment in the outdoors. There is one Head Outside, one Reading Reflection, and one Online Discussion required for each Unit. You can find the individual unit assignments within each respective unit, under Assignments on D2L, or by clicking on the links below.

1. **Online Discussion** assignments ask you to post a response to a given question or statement on the D2L discussion board. Next, respond to at least one other classmate's post with personal impressions, reactions, or reflections.

2. ***Head Outside** assignments ask you to complete a task outdoors and report observations to the D2L secured assignment drop box.

3. ***Reading Reflection** assignments ask you to recall, analyze, generalize, predict, or evaluate information in a research article or other document and report reflections to the D2L secured assignment drop box.

Unit 1 Assignments

All assignments must be completed and submitted to the secured D2L drop box or online discussion board by midnight Saturday, August 5th, 2006.

Online Discussion: Research shows time spent outdoors with a positive role model tends to lead to an increase in environmental sensitivity or empathy for the environment. How would you rate your interest in the environment; strong, moderate, or mild? Who or what influenced your interest? What was it about that person you found inspiring or memorable? Given your explanation, do you do anything to influence or inspire your classroom students?

Head Outside: Identify at least two different stimuli for each auditory learners, visual learners, and kinesthetic learners. Do you tend to observe things you see, hear, or feel first?

Although learning modalities and multiple intelligences are ways in which people learn and retain information, they are also preferences for teaching information. Focus on some natural object or process around you. How would you teach about that object or process? Which of your learning styles (or combination of styles) do you use most? Primarily which of your intelligences (or combination of intelligences) do you use most?

Which intelligences or learning styles do you tend to neglect when teaching about the environment?

Reading Reflection: In your own words, briefly describe outdoor education and some of the reasons educators choose to bring students outdoors. Which of the competencies described in the Simmons & Richardson article do you feel you already have as an educator? What are some competencies you feel you could improve on or have room to grow?

Unit 2 Assignments

All assignments must be completed and submitted to the secured D2L drop box or online discussion board by midnight Saturday, August 12th, 2006.

Online Discussion: Start your own phenology. Record at least 3 observations of natural objects or occurrences that you find interesting such as flowers blooming, young animals, weather patterns, rainfall, or number of dandelions in your front yard. Share your information on the discussion board and compare with classmates living in different locations. Next, respond to at least one other person's observation. What similarities or differences do you see? How might you incorporate this activity into your classroom or what would you do to encourage your students to question and explore?

Head Outside: Find 2 pieces of 8" x 11" scratch paper and a pencil or pen and head outside. Find a comfortable spot and roll one piece of paper into a tube like a telescope. One end of the tube will be your "fact lens" and the other end will be your "feelings lens." Look through your fact lens so that you can see part of a natural area. (You'll want to look at the same place throughout the activity.) On the scratch paper, write down 3 things you *know* about what you are looking at. After a couple minutes, turn your tube around to the feeling lens. Write down 3 things you *feel* when watching that place through the scope.

Which lens was easier for you? Why do you suppose it was easier? Through which lens do you most often look through when you teach? Are they the same? Why or why not? Using the theory of multiple intelligences or learning styles, how can you encourage students to identify their own feelings towards something in the natural world?

Reading Reflection: Explain what environmental topics, if any, you currently teach (adaptations, habitats, four elements of life, life's interconnections, energy flow, phenelogy, sustainability). Brainstorm specific ways you could teach these topics using the theory of multiple intelligences or learning styles.

Unit 3 Assignments

All assignments must be completed and submitted to the secured D2L drop box or online discussion board by midnight Saturday, August 19th, 2006.

Online Discussion: Search the internet, your local library, and other curricular resources to find at least 3 lesson plans or outdoor activities aimed at your intended audience. Then, share

those findings in the appropriate discussion board for K-4, 5-8 or 9-12 grade levels. Work together in the grade level groups to find activities that fit the needs of your facility.

You can get some great ideas from Unit 3 and these websites.

EE-Link

EEK Teacher Pages

Global Environmental & Outdoor Education Council

EPA Curriculum Resources

Canadian Parks and Wilderness Society

The GLOBE Program

Five-Minute Field Trips

Head Outside: Many times as educators we are required to try and see things from a different perspective. This nature journaling activity helps to decentralize ourselves and consider things from something else's point-of-view. Express your experience in however you feel most comfortable (poem, picture, song, story, etc.) and submit it to the drop box. How might your students express their experience? [You don't need to worry about reading a book] Click on Journaling Activity

Reading Reflections: Because we know students learn in different ways, specifically explain how you would adapt any one of the eleven teaching strategies and activities to meet a variety of learning styles or intelligences.

Unit 4 Assignments

Unit 4 Online Discussion is due by midnight Saturday, August 26th. Choose only one Track (A or B) according to your comfort & experience when teaching outdoors. Head Outside and Reading Reflection assignments must be completed and submitted to the secured D2L drop box by midnight Saturday, September 2nd, 2006.

Online Discussion: After having studied teacher and learner considerations, environmental topics to teach, and the different strategies and activities for teaching outdoor environmental education throughout this course, finish this sentence: "Something I'd like to try is _____ because_____.

Track A (for those who are beginners)
Head Outside: Locate and visit an environmental education facility or nature center that conducts outdoor programs. NatureNet can help you locate environmental facilities in your area.

Reading Reflection: After observing or participating in such program, submit the following:
1. A detailed summary of the program including goals and description of activities.
2. A reflection paper detailing strengths, weaknesses and overall achievement of the activity as it relates to teacher/learner needs, environmental topics, outdoor teaching strategies, and planning and preparation.

(or)

Track B (for those with some experience)
Head Outside: Locate & modify an outdoor learning activity or lesson. Conduct that activity with any group of individuals (class, your own children, neighbors, family members, etc.).

Reading Reflection: After the outdoor program, submit the following:
1. A lesson plan including goals, objectives and description of activities about environmental topics.
2. A reflection paper on strengths, weaknesses and overall achievement of the activity as it relates to teacher/learner needs, environmental or natural history topics, outdoor teaching strategies, and planning and preparation.

Please Note - Along with the written portion of the assignment, please submit 2 or 3 digital pictures illustrating your participation. For a digital photo "how to," click here.

APPENDIX I
***TAEO* GRADING SCALE AND ASSIGNMENT RUBRICS**

Grading Scale & Assignment Rubrics

TAEO Grading Scale

There are 100 total points available for the course. The points are awarded as follows:

4 Online Discussion assignments x 5 points each	= 20 points
4 Head Outside assignments x 10 points each	= 40 points
4 Reading Reflection assignments x 10 points each	= 40 points
Total	= 100 points

93 - 100 = A
90 - 92 = A-
87 - 89 = B+
83 - 86 = B
80 - 82 = B-
77 - 79 = C+
73 - 76 = C
70 - 72 = C-
67 - 69 = D+
63 - 66 = D
60 - 62 = D-
Below 60 = F

TAEO Rubric

Online Discussions
4-5 points: Discussion posts are clearly stated, well thought out, and provide a detailed description of student's answers to questions, a personal view, or experiences in regards to the Unit assignment. Discussion posts are supported with examples. Responses to classmates' discussion posts should be relative to the topic, clearly stated, and conversational.

2-3 points: Discussion posts are complete in regards to the Unit assignment, but are not necessarily clear, well thought out, or provide a detailed description of one's answers to questions, a personal view, or experiences. Responses to classmates' discussion posts are vague or incomplete.

0-1 points: Discussion posts are incomplete in regards to the Unit assignment. There are no responses to classmates' discussion posts.

Head Outside
9-10 points: Assignment undoubtedly indicates that student fully completed the outdoor activity. Assignment is clearly stated, well thought out, and provides a detailed description of

student's answers to questions, a personal view, or experience in regards to the Unit assignment. Assignment is supported with examples from the outdoor experience. Assignment is specific and complete.

7-8 points: Assignment undoubtedly indicates that student completed the outdoor activity. Assignment is clearly stated and provides a description of student's answers to questions, a personal view, or experience in regards to the Unit assignment. Assignment is supported with few examples from the outdoor experience. Assignment is complete, but lacking in details.

5-6 points: Assignment indicates that student may have completed the outdoor activity. Assignment provides a description of student's answers to questions, a personal view, or experience in regards to the Unit assignment. Assignment lacks examples and details, but is complete.

3-4 points: Assignment indicates that student did not complete the outdoor activity. Assignment is vague or incomplete in its description of student's answers to questions, a personal view, or experience in regards to the Unit assignment.

1-2 points: Assignment indicates that student did not attempt the outdoor activity. Assignment is incomplete.

Reading Reflection

9-10 points: Assignment undoubtedly indicates that student fully completed the required readings. Assignment is clearly stated, well thought out, and provides a detailed description of student's answers to questions, a personal view or reaction to the readings in regards to the Unit assignment. Assignment is supported with examples from the readings. Assignment is specific and complete.

7-8 points: Assignment undoubtedly indicates that student completed the required readings. Assignment is clearly stated and provides a description of student's answers to questions, a personal view, or reaction to the readings in regards to the Unit assignment. Assignment is supported with few examples from the readings. Assignment is complete, but lacking in details.

5-6 points: Assignment indicates that student may have completed the required readings. Assignment provides a description of student's answers to questions, a personal view, or reaction to the readings in regards to the Unit assignment. Assignment lacks examples and details, but is complete.

3-4 points: Assignment indicates that student did not complete the required readings. Assignment is vague or incomplete in its description of student's answers to questions, a personal view, or reaction to the readings in regards to the Unit assignment.

1-2 points: Assignment indicates that student did not attempt the required readings. Assignment is incomplete.

APPENDIX J
***TAEO* WEBSITE MAP**

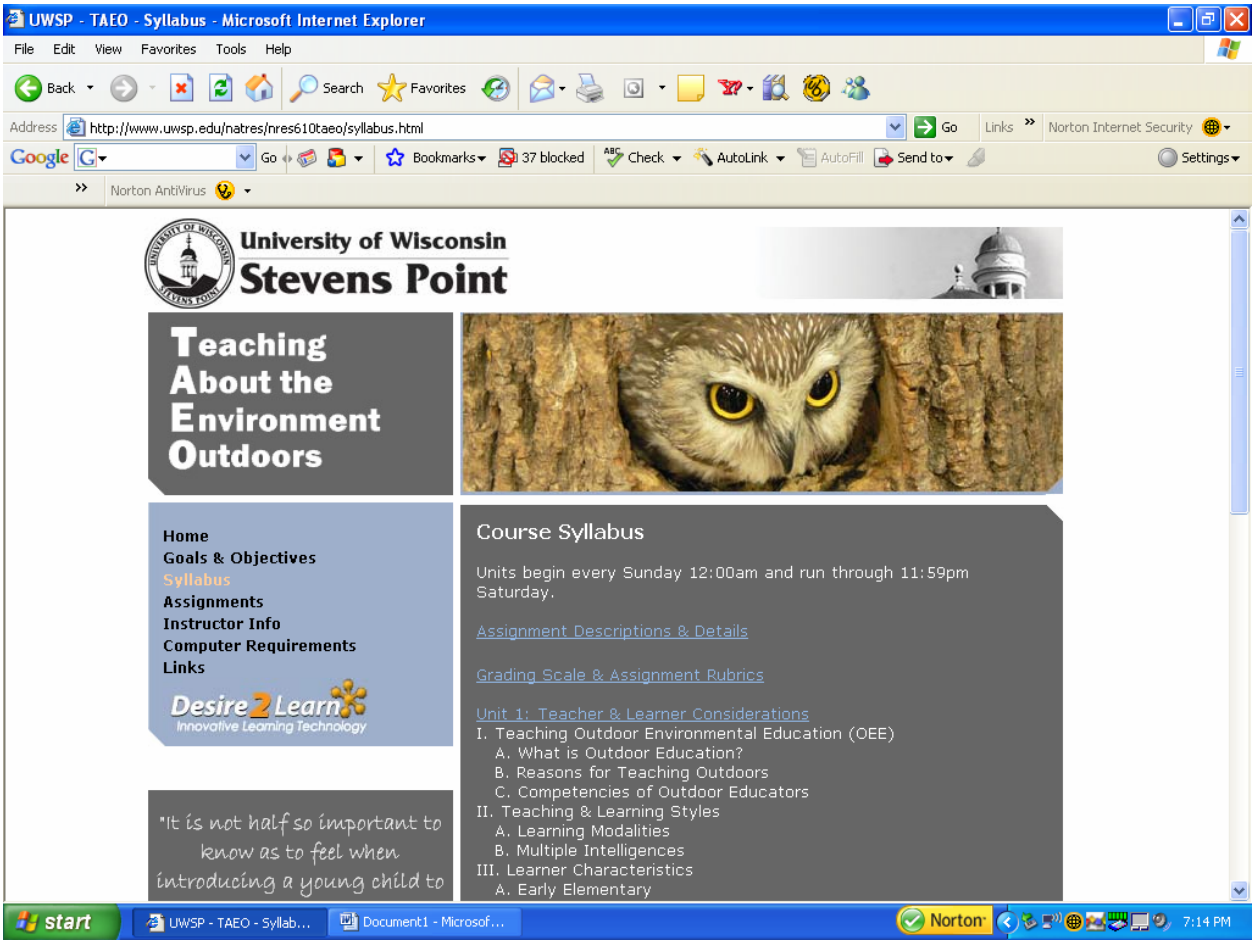
- Home
  - Goals & Objectives
  - Syllabus
    - Assignment Descriptions & Details
    - Grading Scale & Assignment Rubrics
    - Unit 1: Teacher & Learner Considerations
      - I. Teaching Outdoor Environmental Education
      - II. Teaching & Learning Styles
      - III. Learner Characteristics
      - Unit 1 Assignments
    - Unit 2: Topics to Teach
      - I. Environmental Topics A-C
      - I. Environmental Topics D-H
      - II. Likely Outdoor Topics
      - Unit 2 Assignments
    - Unit 3: Teaching Strategies & Activities
      - I. Strategies & Activities A-C
      - I. Strategies & Activities D-F
      - I. Strategies & Activities G-K
      - Unit 3 Assignments
    - Unit 4: Planning & Conducting OEE
      - I. Teacher Planning
      - II. Student Preparation
      - Unit 4 Assignments
  - Assignments
    - Grading Scale & Assignment Rubrics
    - Unit 1 Assignments
    - Unit 2 Assignments
    - Unit 3 Assignments
    - Unit 4 Assignments
  - Instructor Info
  - Computer Requirements
  - Links

APPENDIX K
EXAMPLES OF *TAEO* WEBPAGES

TAEO Homepage

http://www.uwsp.edu/natres/nres610taeo/index.html

TAEO Syllabus



http://www.uwsp.edu/natres/nres610taeo/syllabus.html

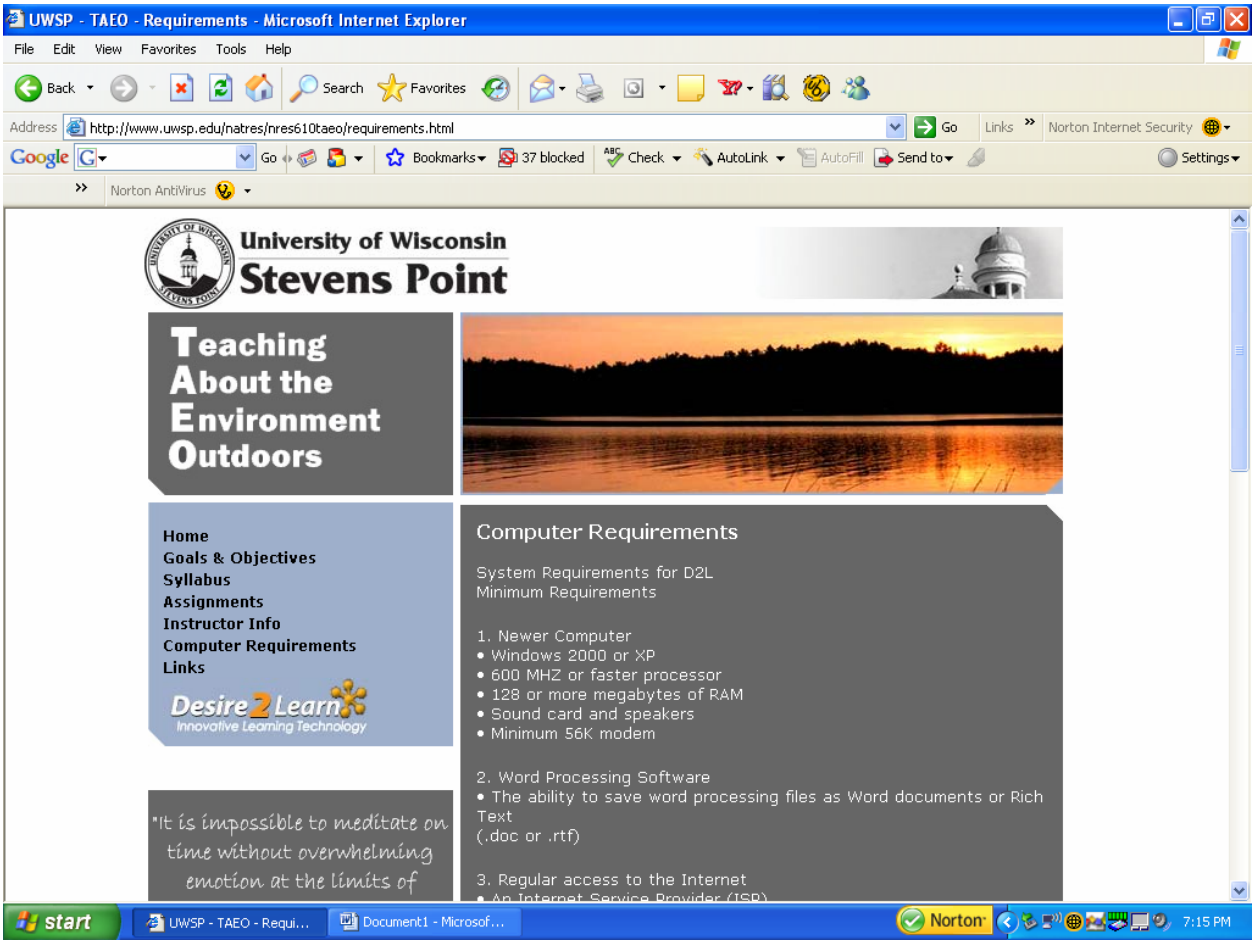
TAEO Assignments Page

http://www.uwsp.edu/natres/nres610taeo/assignments.html

TAEO Instructor Information Page

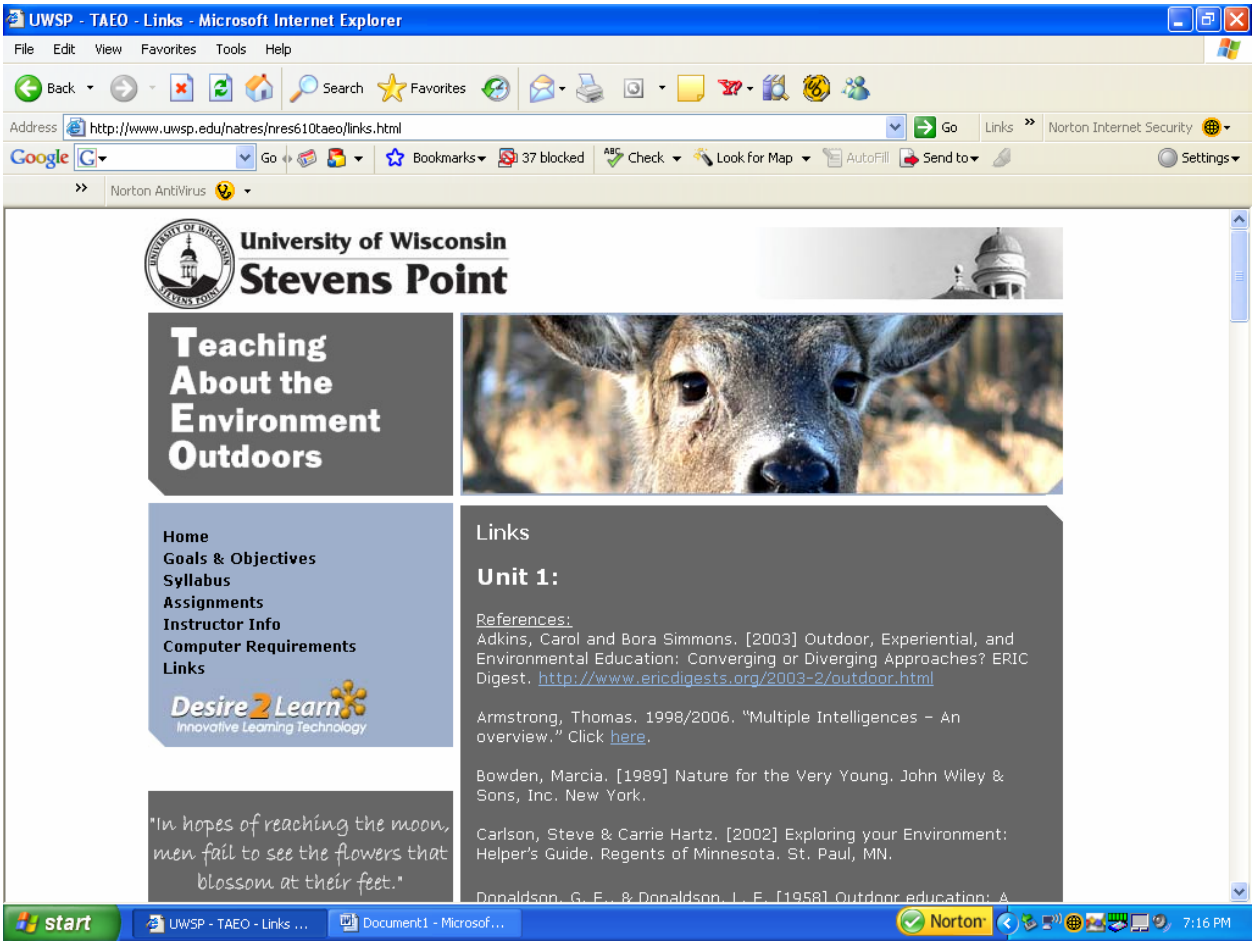
http://www.uwsp.edu/natres/nres610taeo/info.html

TAEO Computer Requirements Page



http://www.uwsp.edu/natres/nres610taeo/requirements.html

TAEO Links Page



http://www.uwsp.edu/natres/nres610taeo/links.html

APPENDIX L
INFORMED CONSENT TO PARTICIPATE IN HUMAN SUBJECT RESEARCH

NRES 610 Special Topics in Environmental Education:
Teaching About the Environment Outdoors (TAEO)

Informed Consent to Participate in Human Subject Research

Karla Lockman, a graduate student at the University of Wisconsin – Stevens Point, and Dr. Randy Champeau, Director of Wisconsin Center for Environmental Education and Associate Dean, College of Natural Resources, are developing an online course titled *NRES 610 Special Topics in Environmental Education: Teaching About the Environment Outdoors (TAEO)*. The goal for the course is to increase in participants their knowledge about teacher and learner needs, environmental topics to teach, strategies and techniques, and planning outdoor activities as it relates to outdoor environmental education (OEE). We would greatly appreciate your participation in this project, as it will provide us with valuable information on the design, content, structure, usefulness, and revisions of the online course. TAEO will empower both formal and non-formal educators to do a better job when bringing their students in the out-of-doors.

As part of this project there will be ten educators to evaluate the online pilot course TAEO. The evaluation process includes a Pre- and a Post- Assessment of participants' knowledge on course content, four formative Likert scale evaluations, a Likert scale evaluation on the course introductory pages and a summative evaluation at the end of the course including both Likert scale and open-ended questions. From July 23rd, 2006 to September 3rd, 2006, each participant must complete the course work and all assessments and evaluations. Each participant will receive one graduate credit from UW-Stevens Point in exchange for their cooperation.

Participation in this project should pose no risk to you other than your time and effort to make TAEO a success.

The results of the TAEO online pilot course will be reported in a presentation at UW-Stevens Point and in the final product of the printed master's thesis being done by Mrs. Lockman. For the purpose of this study, your names will *not* appear in any presentation or public document including Mrs. Lockman's thesis. No information about you will be released to anyone, or made public in any way.

As a participant you will receive one graduate credit from UW-Stevens Point.

If you wish to withdraw from this study at any time, you may do so. Any information that you provided up to that point will be destroyed.

Once the project is complete you will receive one graduate credit and can keep in touch with the Wisconsin Center for Environmental Education for future developments. Please keep one copy of this form for your records and send a signed copy and any questions to:

Karla Lockman
Wisconsin Center for Environmental Education
800 Reserve Street
College of Natural Resources
University of Wisconsin – Stevens Point
Stevens Point, WI 54481

If you have any complaints about your treatment as a participant in this study, please call or write:

Dr. Sandra Holmes, Chair
Institutional Review Board for the Protection of Human Subjects
Department of Psychology
University of Wisconsin – Stevens Point
Stevens Point, WI 54481
715-346-3952

All complaints will be kept confidential

I have received a complete explanation of the study and agree to participate.

Name _____ Date _____
(Signature of subject)

The UWSP Institutional Review Board has approved this research project for the Protection of Subjects.

APPENDIX M
INITIAL LETTER SENT TO PRESPECTIVE PARTICIPANTS

University of Wisconsin Stevens Point
College of Natural Resources
Wisconsin Center for Environmental Education

Web: www.uwsp.edu/cnr/wcee

Summer 2006 Online Course

NRES 610 Special Topics – Teaching About the Environment Outdoors (TAEO)
July 30th – August 26th 2006

Professional Development Course – One FREE Graduate Credit from UWSP
Wisconsin Center for Environmental Education

Greetings,

Children today spend nine times more time indoors being entertained by electronics than they are outdoors playing, observing, and physically experiencing "fresh air" (Louv 2006). By taking students outside of the traditional classroom, teachers can provide great opportunities for positive learning experiences about the environment and meaningful hands-on education in your own schoolyard.

Teaching About the Environment Outdoors (TAEO) is an online course aimed at providing teachers with strategies and experience leading environmental programs in the outdoors. So you may be asking yourself, a course on ***outdoor*** environmental education on the ***computer***?!? TAEO offers outdoor assignments, online discussions about outdoor experiences, and a practical outdoor teaching assignment.

By taking this course you will earn one graduate credit (NRES 610) from UW-Stevens Point. Because this is a pilot course, the **fee for the course has been waived**. In exchange for tuition, participants will be required to help evaluate TAEO by completing a pre- and post-assessment and six short surveys: 1 prior to the course, 4 during the course, and 1 upon conclusion.

If interested, please complete the attached registration form and return to Tim Byers, at tbyers@uwsp.edu. Only 10 participants who apply will be chosen for this summer session. Registrations will be accepted through June 30, 2006.

If you have questions about registration, please contact Tim Byers. If you have questions about the course, please contact Karla Lockman. Thank you for your consideration.

Enclosures

Karla Lockman
Instructor
klock091@uwsp.edu

Tim Byers
Outreach Program Manager
tbyers@uwsp.edu

Wisconsin Center for Environmental Education (WCEE)
Room 110 College of Natural Resources
University of Wisconsin-Stevens Point, Stevens Point WI 54481-3897
Phone: 715-346-4176 Fax: 715-346-3025 Web: www.uwsp.edu/cnr/wcee/

APPENDIX N
COURSE PACKET E-MAIL 7.14.06

Greetings!
Thank you for agreeing to participate in the pilot of NR610: Teaching About the Environment Outdoors (TAEO). This electronic course packet will give you important information before the start of the course.

TAEO will go online Sunday, July 23rd, 2006 at http://www.uwsp.edu/natres/nres610taeo/index.html . I encourage you to familiarize yourself with the introductory pages and links. Please let me know right away if you are experiencing problems accessing the website or links (klockman@uwsp.edu).

Course timeline:

July 23rd-July 30th	Introductory Pages open
July 30th	Course Opens
Jul. 30th – Aug. 5th	Unit 1
August 6th – August 12th	Unit 2
August 13th – August 19th	Unit 3
August 20th – August 26th	Unit 4
August 27th – September 2nd	Last week for Unit 4 assignment
September 3rd	Course Closes

Desire2Learn: TAEO utilizes Desire2Learn (D2L) for online discussions, submitting assignments to a dropbox, viewing grades, and research evaluation surveys. The D2L site for TAEO will open July 23rd. To set up your D2L account, follow the directions in the document titled *How to D2L* attached to this e-mail.

Research Requirement: Because this is a pilot course, it's required that participants complete one Pre-test, one Post-test, and six course evaluation surveys. In exchange for this extra effort, you will earn one graduate credit for *free* (only after every survey has been completed). The pre- and post-tests and course evaluation surveys **will not** in anyway be used in grading and **will not** be viewed until after the course closes on September 3rd. Please print out and complete the *Pre-test* attached to this e-mail and return to Tim Byers at the WCEE address below, on or before July 29th. In addition, please print out, read, and sign the *Informed Consent to Participate in Human Subject Research* document attached to this email and return to me via mail on or before July 29th. (Using same envelope will be just fine)

Karla Lockman
Wisconsin Center for Environmental Education
800 Reserve St.
College of Natural Resources
UW-Stevens Point
Stevens Point, WI 54481

Unit 4 Assignment: The Unit 4 assignment asks **you** to choose from two options and may take additional planning on your part. Track A is for beginners in outdoor environmental education and Track B is for those who feel their skills are more advanced. Although the assignment could be done anytime during the course of TAEO, the content in Units 1-4 will greatly help. The Unit 4 assignment must be completed and submitted to the D2L dropbox on or before September 2nd. Please review *Unit 4 Assignment* attached to this e-mail.

How to get to Desire2Learn

1.) **Connect** to the **Internet**.
2.) In the **address bar**, **type** in **D2L's homepage**: http://uwsp.courses.wisconsin.edu/.

Important:
If you are taking courses for credit you **must** activate your **UWSP** account prior to logging into D2L. To **activate** your account **click** on the "**Activate UWSP Account!"** link on D2L's logon screen.

If you are a UWSP Extension student taking non-credit Professional Development courses you will need to refer to the log on information in your **registration packet** from the **Extension Office**.

Log-on Procedures

Students with UWSP Network Accounts

When logging on to Desire2Learn (D2L), **enter** your current **UWSP username** and **password**, and **click Login**.

If you have **forgotten your password** you will need to **call** the Help Desk at **346-4357** or **email** them at **helpdesk@uwsp.edu**.

Logon Issues: If you are unable to log into Desire2Learn you may be working on a computer where Internet Explorer Privacy settings are set to High. This will disable the cookies used by D2L.

Once you are logged on, click on NRES610: Teaching About the Environment Outdoors. **Visit the student tutorial** on the upper right side of the page to become familiar with D2L. Let me know if you have any problems **klockman@uwsp.edu**.

APPENDIX O
TAEO PRETEST RESULTS

NR 610: TAEO Pretest	n = 10						
I. Teacher & Learner Considerations	5	4	3	2	1	Total	
I.1What is Outdoor Environmental Education (OEE)?	20%	60%	20%	0%	0%	100%	
I.2 Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE	0%	60%	20%	20%	0%	100%	
I.3 Teaching and learning styles	40%	50%	10%	0%	0%	100%	
I.4 Environmental sensitivity	20%	80%	0%	0%	0%	100%	
Student / Question	I.1	I.2	I.3	I.4			
1	4	2	4	4			
2	3	3	4	5			
3	4	2	4	4			
4	4	3	3	4			
5	5	4	4	4			
6	4	4	4	4			
7	5	4	5	4			
8	3	4	5	4			
9	4	4	5	4			
10	4	4	5	5			
Mean	4.00	3.40	4.30	4.20			
Standard Deviation	0.6666667	0.843274	0.6749486	0.421637			

II. Outdoor Environmental Topics

II.1 Adaptations	50%	50%	0%	0%	0%	100%	
II.2 Habitats	70%	30%	0%	0%	0%	100%	
II.3 Four Elements of Life (sun, air, water & soil)	30%	70%	0%	0%	0%	100%	
II.4 Life's Interconnections	50%	50%	0%	0%	0%	100%	
II.5 Energy Flow (i.e. food chain)	60%	40%	0%	0%	0%	100%	
II.6 Phenology (cycles)	10%	70%	10%	10%	0%	100%	
II.7 Sustainability	50%	50%	0%	0%	0%	100%	
Student / Question	II.1	II.2	II.3	II.4	II.5	II.6	II.7
1	4	4	5	4	4	2	5
2	4	4	4	4	4	4	4
3	5	5	4	4	4	4	4
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	4	5	4	5	5	4	4
7	5	5	4	5	5	4	5
8	5	5	5	5	5	4	5
9	4	5	4	5	5	3	5
10	5	5	4	4	5	4	5
Mean	4.50	4.70	4.30	4.50	4.60	3.80	4.60
Standard Deviation	0.5270463	0.4830459	0.4830459	0.5270463	0.5163978	0.7888106	0.5163978

III. Teaching strategies and activities.

III.1 Leading a hike	30%	60%	0%	10%	0%	100%	
III.2 Storytelling	20%	20%	30%	30%	0%	100%	
III.3 Creative drama	0%	20%	10%	70%	0%	100%	
III.4 Sensory Learning	10%	40%	40%	10%	0%	100%	
III.5 Experiments	60%	30%	10%	0%	0%	100%	
III.6 Games	30%	50%	0%	20%	0%	100%	
III.7 Simulations	30%	40%	30%	0%	0%	100%	
III.8 Data Collection	50%	40%	10%	0%	0%	100%	
III.9 Gardening	20%	30%	50%	0%	0%	100%	
III.10 Nature Journaling	10%	60%	20%	10%	0%	100%	
III.11 Scavenger Hunts	30%	60%	0%	10%	0%	100%	
III.12 Field Trips	50%	40%	0%	0%	10%	100%	
Student / Question	III.1	III.2	III.3	III.4	III.5	III.6	
1	4	2	2	4	4	2	
2	2	2	2	3	3	4	
3	5	4	4	4	5	5	
4	5	3	2	4	4	4	
5	5	2	2	2	5	2	
6	4	3	2	3	5	4	
7	4	3	2	4	5	4	
8	4	5	2	3	5	5	
9	4	5	4	5	5	5	
10	4	4	3	3	4	4	
Mean	4.10	3.30	2.50	3.50	4.50	3.90	
Standard Deviation	0.8755 950	1.1595 018	0.8498 366	0.8498 366	0.7071 068	1.1005 049	
	III.7	III.8	III.9	III.10	III.11	III.12	
	4	4	4	2	4	4	
	3	3	3	3	2	1	
	5	5	3	3	5	5	
	3	4	3	4	4	4	
	5	5	2	4	4	5	
	3	5	5	5	4	5	
	5	5	3	4	4	4	
	4	5	5	4	5	5	
	4	4	4	4	5	5	
	4	4	3	4	4	4	
Mean	4.00	4.40	3.50	3.70	4.10	4.20	
Standard Deviation	0.8164 966	0.6992 059	0.9718 253	0.8232 726	0.8755 950	1.2292 726	

IV. Planning & Conducting OEE programs

IV.1 Resources & activity guides for OEE activities	30%	60%	10%	0%	0%	100%	
IV.2 Internet websites on the topic of OEE	30%	50%	10%	10%	0%	100%	
Student / Question	IV.1	IV.2					
1	4	4					
2	4	4					
3	4	5					
4	4	4					
5	5	5					
6	4	5					
7	5	3					
8	3	2					
9	5	4					
10	4	4					
Mean	4.20	4.00					
Standard Deviation	0.6324555	0.9428090					

Pretest Means & Standard Deviations

5-very knowledgeable; 4-somewhat knowledgeable; 3-neutral; 2-little knowledge; 1-no knowledge

I. Teacher & Learner Considerations

Pretest Questions (n = 10)	5	4	3	2	1	Mean (M) Standard Deviation (SD)
What is Outdoor Environmental Education (OEE)?	20%	60%	20%	0%	0%	M = 4.00 SD = .67
Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE		60%	20%	20%	0%	M = 3.40 SD = .84
Teaching and learning styles	40%	50%	10%	0%	0%	M = 4.30 SD = .67
Environmental sensitivity	20%	80%	0%	0%	0%	M = 4.20 SD = .42

II. Outdoor Environmental Topics.

Pretest Questions (n = 10)	5	4	3	2	1	Mean (M) Standard Deviation (SD)
Adaptations	50%	50%	0%	0%	0%	M = 4.50 SD = .54
Habitats	70%	30%	0%	0%	0%	M = 4.70 SD = .48
Four Elements of Life (sun, air, water & soil)	30%	70%	0%	0%	0%	M = 4.30 SD = .48
Life's Interconnections	50%	50%	0%	0%	0%	M = 4.50 SD = .54
Energy Flow (i.e. food chain)	60%	40%	0%	0%	0%	M = 4.60 SD = .52
Phenology (cycles)	10%	70%	10%	10%	0%	M = 3.80 SD = .79
Sustainability	50%	50%	0%	0%	0%	M = 4.50 SD = .52

Please list other outdoor environmental education topics you can think of.

Conservation – water & soil
Watersheds
Air /Climate
Endangered Species
Built environments
Energy use (natural resources)
Population
Too numerous to list.
Politics
Economics
Species ID
Restoration
Waste

5-very knowledgeable; 4-somewhat knowledgeable; 3-neutral; 2-little knowledge; 1-no knowledge

III. Teaching Strategies and Activities.

Pretest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
Leading a hike	30%	60%	0%	10%	0%	M = 4.10 SD = .88
Storytelling	20%	20%	30%	30%	0%	M = 3.30 SD = 1.16
Creative drama	0%	20%	10%	70%	0%	M = 2.50 SD = .85
Sensory learning	10%	40%	40%	10%	0%	M = 3.50 SD = .85
Experiments	60%	30%	10%	0%	0%	M = 4.50 SD = .71
Games	30%	50%	0%	20%	0%	M = 3.90 SD = 1.10
Simulation	30%	40%	30%	0%	0%	M = 4.00 SD = .82
Data Collection	50%	40%	10%	0%	0%	M = 4.40 SD = .70
Gardening	20%	30%	50%	0%	0%	M = 3.70 SD = .97
Nature Journaling	10%	60%	20%	10%	0%	M = 3.70 SD = .82
Scavenger Hunts	30%	60%	0%	10%	0%	M = 4.10 SD = .88
Field Trips	50%	40%	0%	0%	10%	M = 4.20 SD = 1.23

Please list other outdoor environmental education strategies or activities you can think of.
Guest speakers (LCD, Ducks Unlimited, etc.)
Initiatives
Art projects
Place-based ed & tasks
Design Land use

IV. Planning and Conducting Outdoor Environmental Education Programs

Pretest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
Resources and activity guides for OEE activities	30%	60%	10%	0%	0%	M = 4.20 SD = .63
Internet websites on the topic of OEE	30%	50%	10%	10%	0%	M = 4.00 SD = .94

Please list major considerations for planning and conducting programs about the environment in the outdoors.
I'd like to implement 2-3 outdoor activities in each class (in addition to my curriculum)
Time for both planning and conducting, availability and access to sites, funding/materials, willingness of educators to use the outdoors as a classroom.
Need reliable lesson-plan ready sites on the web
Environment (safety, timing, comfort)
Materials (having all materials, prepared, easily managed, mobile)
Human resources (experts)

APPENDIX P
TAEO POSTTEST RESULTS

NR 610: TAEO Posttest	n = 10						
I. Teacher & Learner Considerations	5	4	3	2	1	Total	
I.1What is Outdoor Environmental Education (OEE)?	80%	20%	0%	0%	0%	100%	
I.2 Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE	40%	60%	0%	0%	0%	100%	
I.3 Teaching and learning styles	60%	40%	0%	0%	0%	100%	
I.4 Environmental sensitivity	90%	10%	0%	0%	0%	100%	
Student / Question	I.1	I.2	I.3	I.4			
1	4	4	4	4			
2	4	4	4	5			
3	5	5	5	5			
4	5	4	4	5			
5	5	4	5	5			
6	5	4	4	5			
7	5	5	5	5			
8	5	4	5	5			
9	5	5	5	5			
10	5	5	5	5			
Mean	4.80	4.40	4.60	4.90			
Standard Deviation	0.42163 702	0.51639 778	0.51639 778	0.31622 777			

II. Outdoor Environmental Topics

II.1 Adaptations	80%	20%	0%	0%	0%	100%	
II.2 Habitats	90%	10%	0%	0%	0%	100%	
II.3 Four Elements of Life (sun, air, water & soil)	50%	50%	0%	0%	0%	100%	
II.4 Life's Interconnections	80%	20%	0%	0%	0%	100%	
II.5 Energy Flow (i.e. food chain)	70%	30%	0%	0%	0%	100%	
II.6 Phenology (cycles)	70%	30%	0%	0%	0%	100%	
II.7 Sustainability	60%	40%	0%	0%	0%	100%	
Student / Question	II.1	II.2	II.3	II.4	II.5	II.6	II.7
1	4	4	4	4	4	4	4
2	4	5	4	4	4	5	4
3	5	5	5	5	5	5	5
4	5	5	4	5	4	4	4
5	5	5	5	5	5	5	5
6	5	5	5	5	5	5	5
7	5	5	5	5	5	5	5
8	5	5	4	5	5	5	4
9	5	5	5	5	5	5	5
10	5	5	4	5	5	4	5
Mean	4.80	4.90	4.50	4.80	4.70	4.70	4.60
Standard Deviation	0.4216370	0.3162278	0.5270463	0.4216370	0.4830459	0.4830459	0.5163978

III. Teaching strategies and activities.

III.1 Leading a hike	70%	20%	10%	0%	0%	100%	
III.2 Storytelling	0%	80%	20%	0%	0%	100%	
III.3 Creative drama	0%	60%	30%	10%	0%	100%	
III.4 Sensory Learning	60%	30%	0%	0%	0%	90%	
III.5 Experiments	70%	20%	10%	0%	0%	100%	
III.6 Games	50%	50%	0%	0%	0%	100%	
III.7 Simulations	50%	50%	0%	0%	0%	100%	
III.8 Data Collection	80%	20%	0%	0%	0%	100%	
III.9 Gardening	30%	50%	10%	10%	0%	100%	
III.10 Nature Journaling	80%	20%	0%	0%	0%	100%	
III.11 Scavenger Hunts	80%	10%	10%	0%	0%	100%	
III.12 Field Trips	70%	20%	0%	10%	0%	100%	
Student / Question	III.1	III.2	III.3	III.4	III.5	III.6	
1	4	4	4	4	4	4	
2	3	3	2	4	3	4	
3	5	4	4	5	5	5	
4	5	3	3		5	5	
5	5	4	4	5	5	4	
6	5	4	3	5	5	4	
7	5	4	4	5	5	4	
8	4	4	2	5	5	5	
9	5	4	4	4	5	5	
10	5	4	4	5	4	5	
Mean	4.60	3.80	3.40	4.67	4.60	4.50	
Standard Deviation	0.6992059	0.4216370	0.8432740	0.5000000	0.6992059	0.5270463	
	III.7	III.8	III.9	III.10	III.11	III.12	
	4	4	4	4	4	4	
	4	4	3	5	3	2	
	5	5	2	5	5	5	
	4	5	4	5	5	5	
	5	5	4	5	5	5	
	4	5	5	4	5	5	
	4	5	5	5	5	5	
	5	5	4	5	5	4	
	5	5	5	5	5	5	
	5	5	4	5	5	5	
Mean	4.50	4.80	4.00	4.80	4.70	4.50	
Standard Deviation	0.5270463	0.4216370	0.9428090	0.4216370	0.6749486	0.9718253	

IV. Planning & Conducting OEE programs

IV.1 Resources & activity guides for OEE activities	80%	20%	0%	0%	0%	100%	
IV.2 Internet websites on the topic of OEE	70%	20%	10%	0%	0%	100%	
Student / Question	IV.1	IV.2					
1	4	4					
2	4	3					
3	5	5					
4	5	4					
5	5	5					
6	5	5					
7	5	5					
8	5	5					
9	5	5					
10	5	5					
Mean	4.80	4.60					
Standard Deviation	0.4216370	0.6992059					

Posttest Means & Standard Deviations

5-very knowledgeable; 4-somewhat knowledgeable; 3-neutral; 2-little knowledge; 1-no knowledge

I. Teacher & Learner Considerations

Posttest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
What is Outdoor Environmental Education (OEE)?	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Howard Gardner's Theory of Multiple Intelligences (MI) as it relates to OEE	40%	60%	0%	0%	0%	M = 4.40 SD = .52
Teaching and learning styles	60%	40%	0%	0%	0%	M = 4.60 SD = .52
Environmental sensitivity	90%	10%	0%	0%	0%	M = 4.90 SD = .32

II. Outdoor Environmental Topics.

Posttest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
Adaptations	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Habitats	90%	10%	0%	0%	0%	M = 4.90 SD = .32
Four Elements of Life (sun, air, water & soil)	50%	50%	0%	0%	0%	M = 4.50 SD = .53
Life's Interconnections	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Energy Flow (i.e. food chain)	70%	30%	0%	0%	0%	M = 4.70 SD = .48
Phenology (cycles)	70%	30%	10%	10%	0%	M = 4.70 SD = .48
Sustainability	60%	40%	0%	0%	0%	M = 4.60 SD = .52

Please list other outdoor environmental education topics you can think of.
Organism Identification
Too many to mention!
Invasive species
Habitat restoration
Predator-Prey relationships

5-very knowledgeable; 4-somewhat knowledgeable; 3-neutral; 2-little knowledge; 1-no knowledge

III. Teaching Strategies and Activities.

Posttest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
Leading a hike	70%	20%	1%	0%	0%	M = 4.60 SD = .70
Storytelling	0%	80%	20%	0%	0%	M = 3.80 SD = .42
Creative drama	0%	60%	30%	10%	0%	M = 3.40 SD = .84
Sensory learning	60%	30%	0%	0%	0%	M = 4.67 SD = .50
Experiments	70%	20%	10%	0%	0%	M = 4.60 SD = .70
Games	50%	50%	0%	0%	0%	M = 4.50 SD = .53
Simulation	50%	50%	0%	0%	0%	M = 4.50 SD = .53
Data Collection	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Gardening	30%	50%	10%	10%	0%	M = 4.00 SD = .94
Nature Journaling	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Scavenger Hunts	80%	10%	10%	0%	0%	M = 4.70 SD = .67
Field Trips	70%	20%	0%	10%	0%	M = 4.50 SD = .97
Please list other outdoor environmental education strategies or activities you can think of. Ecosystem Restoration						

IV. Planning and Conducting Outdoor Environmental Education Programs

Posttest Questions (n = 10)	**5**	**4**	**3**	**2**	**1**	**Mean (M) Standard Deviation (SD)**
Resources and activity guides for OEE activities	80%	20%	0%	0%	0%	M = 4.80 SD = .42
Internet websites on the topic of OEE	70%	20%	10%	0%	0%	M = 4.60 SD = .70
Please list major considerations for planning and conducting programs about the environment in the outdoors. Safety, clothing, weather Transportation to site, risk management, pre & post activities, size of class and available equipment Student needs (allergies, physical limitations, etc.) Safety, accessibility, flexibility, of schedules and people, transportation						

APPENDIX Q
TAEO PRETEST-POSTTEST COMPARITIVE RESULTS

Question	Posttest	Minus Pretest	deviation scores	squared deviations
I.1	4.80	4.00	0.80	0.64
I.2	4.40	3.40	1.00	1.00
I.3	4.60	4.30	0.30	0.09
I.4	4.90	4.20	0.70	0.49
II.1	4.80	4.50	0.30	0.09
II.2	4.90	4.70	0.20	0.04
II.3	4.50	4.30	0.20	0.04
II.4	4.80	4.50	0.30	0.09
II.5	4.70	4.60	0.10	0.01
II.6	4.70	3.80	0.90	0.81
II.7	4.60	4.50	0.10	0.01
III.1	4.60	4.10	0.50	0.25
III.2	3.80	3.30	0.50	0.25
III.3	3.40	2.50	0.90	0.81
III.4	4.67	3.50	1.17	1.37
III.5	4.60	4.50	0.10	0.01
III.6	4.50	3.90	0.60	0.36
III.7	4.50	4.00	0.50	0.25
III.8	4.80	4.40	0.40	0.16
III.9	4.00	3.70	0.30	0.09
III.10	4.80	3.70	1.10	1.21
III.11	4.70	4.10	0.60	0.36
III.12	4.50	4.20	0.30	0.09
IV.1	4.80	4.20	0.60	0.36
IV.2	4.60	4.00	0.60	0.36

Posttest mean =	4.56	SS (sum of squares) =	9.24
n =	25	S^2 (variance) =	0.38
Pretest mean=	4.04	Posttest SD =	0.62
df =	24	S_M (standard error of mean) =	0.12
Pretest SD=	0.494874		

t = 4.21 Use p = .05. What is the critical value? + or -2.07

Student	Posttest	Minus Pretest	deviation scores	squared deviations
1	4.00	3.60	0.40	0.16
2	3.76	3.28	0.48	0.23
3	4.80	4.24	0.56	0.31
4	4.46	3.76	0.70	0.49
5	4.80	4.20	0.60	0.36
6	4.68	4.16	0.52	0.27
7	4.84	4.24	0.60	0.36
8	4.60	4.28	0.32	0.10
9	4.88	4.40	0.48	0.23
10	4.76	4.12	0.64	0.41
Posttest mean =	4.56		SS (sum of squares) =	2.93
n =	10		S^2 (variance) =	0.33
Pre-test mean=	4.03		Posttest SD =	0.57
df =	9		S_M (standard error of mean) =	0.18
Pretest SD=	0.359			

t = 2.94

Use p = .05. What is the critical value? + or -2.26

APPENDIX R
TAEO COURSE INTRODUCTORY PAGES LIKERT QUESTION RESULTS

NR 610: Course Introductory Pages Results	n = 10					
5-strongly agree; 4-agree; 3-neutral; 2-disagree; 1-strongly disagree	5	4	3	2	1	Total
1. The Course Homepage generates an interest to investigate the course further.	30%	60%	10%	0%	0%	100%
2. The Course Goals and Objectives were clearly stated.	60%	30%	10%	0%	0%	100%
3. The Course Syllabus page gave you enough information regarding course content, unit descriptions and unit timeline	60%	30%	0%	10%	0%	100%
4. The Assignments page included all the necessary information about Head Outside, Reading Reflection, Online Discussion, & the Practicum Assignment.	50%	40%	10%	0%	0%	100%
5. The Instructor Information page gave necessary instructor qualifications and helped to personalize the course.	60%	40%	0%	0%	0%	100%
6. The Computer Requirement page was understandable and informational.	30%	60%	10%	0%	0%	100%
7. The Links page was helpful and organized appropriately.	50%	40%	10%	0%	0%	100%
8. Instructions for the Course Evaluations were understandable.	40%	50%	10%	0%	0%	100%
9. Logging into D2L was no problem at all.	50%	10%	30%	10%	0%	100%
10. I was able to locate and access the online discussion board.	70%	30%	0%	0%	0%	100%
11. I was able to locate and access the dropbox.	70%	30%	0%	0%	0%	100%
Student / Question	#1	#2	#3	#4	#5	#6
1	4	5	4	4	4	4
2	3	3	2	3	4	3
3	5	4	4	4	5	5
4	5	5	5	5	5	5
5	4	5	5	5	5	4
6	4	5	5	5	5	4
7	4	5	5	5	4	4
8	4	4	5	4	5	4
9	5	5	5	5	5	5
10	4	4	4	4	4	4
Mean	4.20	4.50	4.40	4.40	4.60	4.20
Standard Deviation	0.6324555	0.7071068	0.9660918	0.6992059	0.5163978	0.6324555

Student / Question	#7	#8	#9	#10	#11	
1	4	4	2	4	4	
2	3	3	3	5	5	
3	5	5	5	5	5	
4	5	5	5	5	5	
5	5	4	5	5	5	
6	4	4	3	5	5	
7	4	4	3	4	4	
8	5	5	5	5	5	
9	5	5	5	5	5	
10	4	4	4	4	4	
Mean	4.40	4.30	4.00	4.70	4.70	
Standard Deviation	0.6992 059	0.6749 486	1.1547 005	0.4830 459	0.4830 459	

APPENDIX S
TAEO COURSE INTRODUCTORY PAGES OPEN-ENDED COMMENTS

Comments on overall Course Introductory Pages:
- Looks great!
- Very well done. I've had many online courses, and this format is quite user-friendly.
- Well organized
- I like the format - it seems easy to navigate.

Comments on Course Goals & Objectives page:
- Very detailed and easy to understand.
- Very clear & well worded
- Clear
- Very practical and realistic. Things that we can use in our classes

Comments on Course Syllabus page:
- Good outline.
- Clear and understandable
- Easy to follow.

Comments on Assignments page:
- No problems - very clear expectations.
- Even though I know that assignments are due on Saturday... the teacher in me would love to have seen actual due dates too.
- It broken down appropriately, should be easy to follow.

Comments on Instructor Information page:
- Nice to have a picture and a feel for the instructor's background, interests, etc. It takes the anti-personal computer-generated issue out of the class very well.
- Like the picture... we never know what each other looks like!

Comments on Computer Requirements page:
- Non-computer savvy people can still figure it out - very good.

Comments on Links page:
- Good links.

Comments on logging into D2L:
- Remind people if they use a toolbar on the side of their screen (favorites or whatever) to minimize that in order to see "survey" and "logout" as well as the pager on the right edge of the D2L site.
- After learning how to log into D2L, it seems user friendly! I really am happy about that.
- Easy to follow.

Comments on locating and accessing the online discussion board:

- Have had this in previous classes. It seems to work just fine. Instructor is wonderful at getting back to students with questions in a timely manner.
- I was able to access easily, a fun concept.

Comments on locating and accessing the dropbox:

- Dropbox submissions went through fine. It's nice to have an email confirmation as well.
- I believe it worked!

APPENDIX T
TAEO UNIT 1 LIKERT QUESTION RESULTS

NR 610: Unit 1 Results	n = 10					
5-strongly agree; 4-agree; 3-neutral; 2-disagree; 1-strongly disagree	5	4	3	2	1	Total
1. Unit goals and objectives were clear.	60%	40%	0%	0%	0%	100%
2. The unit readings helped to achieve the course goals and objectives.	60%	30%	10%	0%	0%	100%
3. The unit material was understandable.	70%	30%	0%	0%	0%	100%
4. The unit material was relevant to outdoor environmental education.	90%	10%	0%	0%	0%	100%
5. The unit material was redundant.	0%	10%	30%	50%	10%	100%
6. The unit assignments were clear and had specific instructions.	60%	30%	10%	0%	0%	100%
7. The unit was easy to navigate through.	40%	50%	10%	0%	0%	100%
8. The unit links all worked properly.	40%	40%	0%	20%	0%	100%
9. The directions for the required readings and assignments were clear.	70%	20%	10%	0%	0%	100%
10. The unit progressed in logical order.	70%	30%	0%	0%	0%	100%
Student / Question	#1	#2	#3	#4	#5	#6
1	4	4	4	4	5	4
2	4	4	4	5	3	3
3	5	5	5	5	2	5
4	5	5	5	5	3	5
5	5	5	5	5	3	5
6	5	4	5	5	2	5
7	5	5	5	5	2	5
8	4	5	5	5	2	4
9	5	5	5	5	1	5
10	4	3	4	5	4	4
Mean	4.60	4.50	4.70	4.90	2.70	4.50
Standard Deviation	0.516398	0.707107	0.483046	0.316228	1.159502	0.707107
	#7	#8	#9	#10		
1	4	4	4	4		
2	3	2	3	4		
3	4	4	5	5		
4	5	5	5	5		
5	5	5	5	5		
6	4	4	5	5		
7	5	5	5	5		
8	4	5	5	5		
9	5	2	5	5		
10	4	4	3	4		
Mean	4.30	4.00	4.50	4.70		
Standard Deviation	0.674949	1.154701	0.849837	0.483046		

APPENDIX U
TAEO UNIT 1 OPEN-ENDED COMMENTS

Please list at least one thing you liked about the unit.

- I enjoyed the online discussion. I also enjoyed looking at myself as an outdoor educator and analyzing my strengths and weaknesses.
- I really liked the list of learning characteristics for 16-19 year olds. The one about how "They are very interested in co-ed activities" made me chuckle. I felt as though it is actually something I may glance at when lesson planning in the future.
- I liked retaking the multiple intelligences and modalities tests. I may use these links in my own classes.
- I enjoyed redoing my intelligences...
- I liked that actual tests were included to find your own multiple intelligences and learning styles
- Resources from other areas.
- The outside activity - it made me think about my teaching style
- Finding out about learning preferences at different ages
- Multiple intelligences Learning styles
- I enjoyed the time for reflection on my teaching.

Please list at least one thing you disliked about the unit.

- Some of the links took me too far away from where I needed to be.
- I wish the online intelligence test would have included the natural intelligence. Is there an updated web version available?
- Slightly redundant per the reading reflection and the teacher and learner considerations. I felt like I had to review my competencies as an outdoor educator a few times.
- none
- It is hard to "share my feelings" or observations with others in words on the computer - much rather share face to face
- I feel as though most of us have talked the multiple intelligence angle to death. It was nice to revisit, but I felt as though I already know tons about this subject.
- I don't like using the drop box option... but that's just a personal preference. I would prefer to post things on the message board. It was a lot to keep track of for each section of the course if I didn't do it all at once.
- The "get outside" portion of the assignment didn't really get me outside!
- I did not like how the learner characteristics were completely pirated from another source.

Additional Comments:

- I enjoyed the unit overall! PS I may have inverted my ratings on the initial survey, please note that.
- I thought that it was a good eye-opener as a teacher, that just because you feel that you teach in a way YOU might understand, you still need to keep in mind that your students have multiple learning styles. A teacher needs to hit on a variety of strategies to accommodate all of his/her students.
- The most important aspect in environmental education is to get the kids involved at an early age.

- It was unclear whether or not the "Go Outside" assignment got submitted in the dropbox. Perhaps put that assignment so that the questions are seen when you click on the Unit 1 dropbox and not just the reflection assignment.

APPENDIX V
TAEO UNIT 2 LIKERT QUESTION RESULTS

NR 610: Unit 2 Results	n = 10					
5-strongly agree; 4-agree; 3-neutral; 2-disagree; 1-strongly disagree	5	4	3	2	1	Total
1. Unit goals and objectives were clear.	50%	50%	0%	0%	0%	100%
2. The unit readings helped to achieve the course goals and objectives.	60%	40%	0%	0%	0%	100%
3. The unit material was understandable.	70%	30%	0%	0%	0%	100%
4. The unit material was relevant to outdoor environmental education.	70%	30%	0%	0%	0%	100%
5. The unit material was redundant.	20%	10%	20%	40%	10%	100%
6. The unit assignments were clear and had specific instructions.	40%	50%	0%	10%	0%	100%
7. The unit was easy to navigate through.	60%	30%	10%	0%	0%	100%
8. The unit links all worked properly.	50%	40%	0%	10%	0%	100%
9. The directions for the required readings and assignments were clear.	50%	40%	0%	10%	0%	100%
10. The unit progressed in logical order.	60%	40%	0%	0%	0%	100%
Student / Question	#1	#2	#3	#4	#5	#6
1	4	4	4	4	2	4
2	4	4	4	4	2	4
3	4	4	4	4	4	4
4	5	5	5	5	5	5
5	5	5	5	5	3	4
6	5	5	5	5	5	5
7	5	5	5	5	2	5
8	4	5	5	5	2	5
9	5	5	5	5	1	2
10	4	4	5	5	3	4
Mean	4.50	4.60	4.70	4.70	2.90	4.20
Standard Deviation	0.527046	0.516398	0.483046	0.483046	1.370320	0.918937
	#7	#8	#9	#10		
1	4	4	4	4		
2	3	4	4	4		
3	4	4	4	4		
4	5	5	5	5		
5	5	5	5	5		
6	5	5	5	5		
7	5	5	5	5		
8	5	2	5	5		
9	5	5	2	5		
10	4	4	4	4		
Mean	4.50	4.30	4.30	4.60		
Standard Deviation	0.707107	0.948683	0.948683	0.516398		

APPENDIX W
TAEO UNIT 2 OPEN-ENDED COMMENTS

Please list at least one thing you liked about the unit.

- I liked the phenology assignment very much. I'd like to incorporate phenology into my curriculum in the future.
- I liked the phenology assignment, made me think about it more.
- I felt inspired after working through this unit. It sparked in me wanting to use these topics throughout my upcoming year.
- Nice to have a list of topics to go outside and do with the kids.
- Examples that I can use in the classroom
- It made me reflect on my teaching and it brought new ideas to me on how to incorporate visual learning through the "paper telescope".
- This was a great Head Outside assignment. It is definitely something I could duplicate with my students.
- I liked the "head outside" activity. It was a great way to tie in the way a teacher thinks versus how a teacher teaches.
- I liked the phenology discussion.

Please list at least one thing you disliked about the unit.

- I already knew quite a bit about adaptations, habitats, energy flow, etc. Many of us are quite a ways through our Master's program and have touched on these concepts many, many times.
- The feelings/fact lens assignment was too touchy feely for me. But, I am adverse to those types of assignments most places, it's not your fault.
- I found that always having to link experiences or activities to a specific intelligence or learning style a bit difficult (annoying possibly).
- I have problems downloading certain links. Might have been a problem on my end.
- none that I can think of.
- I didn't like having to brainstorm how to teach the units using different learning styles - as I teach so many different concepts it was hard for me to generate the ideas without actually being in the classroom and in the unit being discussed.
- I found the wording for the last part of the head outside assignment confusing.
- Leave the mult intelligences and learning styles in unit 1. The number of teaching subject areas was enough to reflect on. The rehashing of the learning styles, etc. was redundant and unnecessary.
- The head outside assignment had nothing to do with the unit.

Additional Comments:

- Loved the links, especially for phenology. Thanks!
- Again, I wish that the content for this course's webpage was not all quoted from other sources.
- I realize that this is a on-line course and it is a wonderful thought to be saving paper, but I have a difficult time reading and internalizing information off of a computer screen. It would be wonderful to have "printer friendly" versions of each page and reading. Just a thought.

APPENDIX X
TAEO UNIT 3 LIKERT QUESTION RESULTS

NR 610: Unit 3 Results	n = 10	*n = 9				
5-strongly agree; 4-agree; 3-neutral; 2-disagree; 1-strongly disagree	5	4	3	2	1	Total
1. Unit goals and objectives were clear.	50%	50%	0%	0%	0%	100%
2. The unit readings helped to achieve the course goals and objectives.	50%	30%	20%	0%	0%	100%
3. The unit material was understandable.	60%	30%	0%	10%	0%	100%
*4. The unit material was relevant to outdoor environmental education.	70%	20%	0%	0%	0%	90%
5. The unit material was redundant.	0%	0%	30%	60%	10%	100%
6. The unit assignments were clear and had specific instructions.	30%	50%	10%	10%	0%	100%
7. The unit was easy to navigate through.	70%	30%	0%	0%	0%	100%
8. The unit links all worked properly.	60%	30%	0%	10%	0%	100%
9. The directions for the required readings and assignments were clear.	40%	40%	0%	20%	0%	100%
10. The unit progressed in logical order.	70%	30%	0%	0%	0%	100%
Student / Question	#1	#2	#3	*#4	#5	#6
1	4	3	2	4	2	2
2	4	4	4	**	2	4
3	5	5	4	5	3	4
4	5	3	5	5	3	5
5	4	4	5	5	3	4
6	5	5	5	5	2	5
7	5	5	5	5	2	5
8	4	5	5	5	2	4
9	5	5	5	5	1	4
10	4	4	4	5	2	3
Mean	4.50	4.30	4.40	4.89	2.20	4.00
Standard Deviation	0.527046	0.823273	0.966092	0.333333	0.632456	0.94281
	#7	#8	#9	#10		
1	4	4	2	4		
2	4	4	4	4		
3	5	5	4	5		
4	5	5	5	5		
5	5	5	5	5		
6	5	5	5	5		
7	5	5	2	5		
8	5	5	4	5		
9	5	2	5	5		
10	4	4	4	4		
Mean	4.70	4.40	4.00	4.70		
Standard Deviation	0.483046	0.966092	1.154701	0.483046		
** indicates no response						

APPENDIX Y
TAEO UNIT 3 OPEN-ENDED COMMENTS

Please list at least one thing you liked about the unit.

- I really enjoyed the "Head Outside" assignment....it is fun to do something different!
- I liked writing the poem for the "Head Outside" portion of the unit.
- The Head Outside assignment was a lot of fun.
- Sharing with other teachers is always a nice bonus.
- I liked doing the Head Outdoor journal writing. It was creative and fun.
- Working outside my comfort zone. Sharing ideas with others in the class.
- I really liked taking a look a something and thinking about how it would live a day in our world. It reinforced my belief that agriculture is intertwined with all things - it's just getting people to understand "how".
- I loved the exposure to different ways to use instruction outdoors. I'm definitely going to use some of these ideas this year!
- I liked the head outside activity. It was fun - just like it should be for the kids.
- I enjoyed thinking about how I might incorporate some of these strategies into my classes.

Please list at least one thing you disliked about the unit.

- I felt that these are extremely important ideas and could have been elaborated on.
- I honestly can't think of anything I disliked about the unit. Everything was new and interesting!
- I felt a little silly about doing the Head Outside activity, but I got over it.
- I didn't understand the reading reflections assignment at all. What 11 teaching strategies?
- Not as much discussion on the discussion board. I like to talk, and my people didn't say much
- None
- I didn't understand the reading reflection - but after someone asked the same question I was thinking, I was able to put together some thoughts on adapting an activity that I currently use in class to meet a variety of learning styles.
- By copying and pasting the websites for the discussion, some of them weren't working for me. It was kind of a pain to go back to the assignment page to use them.
- Continued overkill on learning styles / multiple intelligences.
- Too much quoted text in the readings!

Additional Comments:

- I think the readings could be a bit stronger and have more specific information. Again, some of the assignments regarding learning styles/intelligences are getting a bit redundant. One thing that I highly recommend (I had teachers in our project working for credit)...if having them do papers/projects which they will be able to use within their classroom!
- Awesome links for lesson plan ideas!
- It was definitely an unit that made me stop and think. Thanks very much!
- I liked reading the different learning activities. There are a lot of simple ideas that could be adapted in many ways.

APPENDIX Z
TAEO UNIT 4 LIKERT QUESTION RESULTS

NR 610: Unit 4 Results	n = 10	*n = 9				
5-strongly agree; 4-agree; 3-neutral; 2-disagree; 1-strongly disagree	5	4	3	2	1	Total
1. Unit goals and objectives were clear.	60%	40%	0%	0%	0%	100%
2. The unit readings helped to achieve the course goals and objectives.	50%	40%	0%	10%	0%	100%
3. The unit material was understandable.	70%	30%	0%	0%	0%	100%
4. The unit material was relevant to outdoor environmental education.	90%	10%	0%	0%	0%	100%
5. The unit material was redundant.	0%	0%	40%	40%	20%	100%
*6. The unit assignments were clear and had specific instructions.	60%	10%	10%	0%	10%	90%
7. The unit was easy to navigate through.	60%	40%	0%	0%	0%	100%
8. The unit links all worked properly.	50%	40%	10%	0%	0%	100%
9. The directions for the required readings and assignments were clear.	50%	40%	0%	0%	10%	100%
10. The unit progressed in logical order.	70%	30%	0%	0%	0%	100%
Student / Question	#1	#2	#3	#4	#5	*#6
1	4	4	4	5	2	4
2	4	4	4	5	2	4
3	5	5	5	5	3	5
4	5	5	5	5	1	5
5	5	5	5	5	3	5
6	5	5	5	5	2	**
7	5	4	5	5	2	3
8	4	4	5	5	2	5
9	5	5	5	5	1	5
10	4	2	4	4	3	1
Mean	4.60	4.30	4.70	4.90	2.10	4.11
Standard Deviation	0.516398	0.948683	0.483046	0.316228	0.737865	1.364226
	#7	#8	#9	#10		
1	4	4	4	4		
2	4	3	4	5		
3	5	5	4	5		
4	5	5	5	5		
5	5	5	5	5		
6	5	5	5	5		
7	4	4	4	4		
8	5	5	5	5		
9	5	2	5	5		
10	4	4	1	4		
Mean	4.60	4.20	4.20	4.70		
Standard Deviation	0.516398	1.032796	1.229273	0.483046		
** indicates no response						

APPENDIX AA
TAEO UNIT 4 OPEN-ENDED COMMENTS

Please list at least one thing you liked about the unit.

- I enjoyed getting outside and critiquing someone else's teaching style.
- The chance to get outside with kids...I relish those days!
- I enjoyed this lesson. I think when you make assignments applicable to a teacher's daily work, it makes sense!
- Conducting an outdoor activity that I can use with my class.
- The chance to get out and see live resources so close to home. Nature net is also a great resource.
- I liked the creativity of the final assignment.
- The authentic assessment section... always pertinent to classroom activities, yet sometimes a struggle to develop.
- I like including pictures to show what went on for the outdoor portion of the assignment.
- I loved the opportunity to teach my son!

Please list at least one thing you disliked about the unit.

- It was hard, but not impossible, to find a place and time that met my crazy moving schedule.
- NA
- none that I can think of
- Trying to put me experience on paper, and not forget anything!
- I felt as though the directions were very unclear. A better distinction needs to be made between the Head Outside portion and the Reading Reflection portion.
- Contained basic material that I seemed to have picked up along the way in all the master's courses dealing with the outdoors.
- Since it is summer, it's tough to do an activity that could carry over into school with the discrepancy in the ages and numbers of kids to teach.
- Bad timing! The work was due right when I was trying to get ready for school!

Additional Comments:

- Karla, I think overall this course has great value. I hope that it inspires more outdoor education within every classroom!
- It was fun. I enjoy getting class credit for spending time with my kids!
- I hope my photos will come through - if not, please let me know. I am going to have students do a "reflection" on something and use digital photos to help document the activity.
- I really enjoyed this unit. Very useful.

APPENDIX BB
TAEO OVERALL COURSE EVALUATION LIKERT SCALE RESULTS

NR 610: TAEO Overall Course Evaluation Results	n = 10						
DESIGN & TECHNOLOGY							
To what extent were you able to…	5	4	3	2	1	Total	
1. Navigate the course website?	50%	50%	0%	0%	0%	100%	
2. Access the required readings?	50%	50%	0%	0%	0%	100%	
3. Use email to communicate with the instructor?	70%	30%	0%	0%	0%	100%	
4. Use the discussion board to communicate with other participants.	60%	40%	0%	0%	0%	100%	
5. Use the D2L site to upload your assignments and complete evaluations?	50%	40%	0%	10%	0%	100%	
6. Download attachments, links, graphics, and audio in a reasonable time?	40%	40%	10%	10%	0%	100%	
7. Download the course webpage in a reasonable time?	40%	50%	10%	0%	0%	100%	
Student / Question	#1	#2	#3	#4	#5	#6	#7
1	4	5	4	4	4	3	3
2	4	5	5	4	2	4	4
3	5	5	5	5	5	5	5
4	4	4	5	4	4	4	4
5	5	5	5	5	5	5	5
6	5	5	5	5	5	5	5
7	5	4	5	5	4	4	4
8	4	4	4	5	5	2	4
9	5	4	5	5	5	5	5
10	4	4	4	4	4	4	4
Mean	4.50	4.50	4.70	4.60	4.30	4.10	4.30
Standard Deviation	0.5270463	0.5270463	0.4830459	0.5163978	0.9486833	0.9944289	0.67494856

COURSE CONTENT

To what extent do you agree or disagree with the following statements?	5	4	3	2	1	Total	
1. The content provided me with factual information.	60%	40%	0%	0%	0%	100%	
2. The content used examples that helped me understand the information.	50%	40%	0%	10%	0%	100%	
3. The course presented me with new outdoor environmental education nresources via the Internet.	50%	40%	10%	0%	0%	100%	
4. I am more comfortable finding outdoor environmental education resources after taking this course.	30%	60%	10%	0%	0%	100%	
5. The Head Outside assignments were helpful in advancing my learning.	80%	10%	0%	10%	0%	100%	
6. The Reading Reflection assignments were helpful in advancing my learning.	60%	20%	10%	10%	0%	100%	
7. The Online Discussion assignments were helpful in advancing my learning.	50%	40%	10%	0%	0%	100%	
8.The instructions for the assignments were clear	30%	60%	10%	0%	0%	100%	
9. The discussion board was helpful.	40%	30%	30%	0%	0%	100%	
10. There are obvious gaps in the course content.	10%	0%	10%	70%	10%	100%	
Student / Question	#1	#2	#3	#4	#5		
1	4	5	5	5	5		
2	5	5	5	4	5		
3	5	4	5	5	5		
4	4	4	4	4	5		
5	5	5	4	3	5		
6	5	4	5	4	5		
7	4	4	4	4	2		
8	5	5	5	4	5		
9	5	5	4	5	5		
10	4	2	3	4	4		
Mean	4.60	4.30	4.40	4.20	4.60		
Standard Deviation	0.5163978	0.9486833	0.6992059	0.6324555	0.9660918		

Student / Question	#6	#7	#8	#9	#10		
1	5	3	4	3	2		
2	5	4	4	3	2		
3	4	5	4	5	2		
4	4	4	5	3	2		
5	5	5	5	5	3		
6	5	5	5	5	5		
7	2	4	4	4	2		
8	5	5	4	5	2		
9	5	5	4	4	1		
10	3	4	3	4	2		
Mean	4.30	4.40	4.20	4.10	2.30		
Standard Deviation	1.0593499	0.6992059	0.6324555	0.875595	1.0593499		

COURSE STRUCTURE

To what extent to agree or disagree with the following statements?	5	4	3	2	1	Total	
1. The design and layout of the course was attractive and easy to follow.	20%	80%	0%	0%	0%	100%	
2. The grading procedure was clearly defined to me.	60%	20%	20%	0%	0%	100%	
3. The units progressed in a logical order.	60%	40%	0%	0%	0%	100%	
4. The organization of the course was appropriate.	50%	50%	0%	0%	0%	100%	
5. The course material seemed to flow logically.	50%	50%	0%	0%	0%	100%	
6. There seemed to be sufficient interaction between the students.	30%	70%	0%	0%	0%	100%	
7. There seemed to be sufficient interaction between the students and the instructor.	70%	30%	0%	0%	0%	100%	
Student / Question	#1	#2	#3	#4	#5	#6	#7
1	4	5	5	4	4	4	4
2	4	3	5	5	5	4	5
3	4	5	4	4	4	4	5
4	5	5	5	5	5	4	5
5	4	5	5	5	5	5	5
6	5	5	5	5	5	4	5
7	4	4	4	4	4	4	4
8	4	5	5	5	5	5	5
9	4	4	4	4	4	5	5
10	4	3	4	4	4	4	4
Mean	4.20	4.40	4.60	4.50	4.50	4.30	4.70
Standard Deviation	0.4216370	0.8432740	0.5163978	0.5270463	0.5270463	0.4830459	0.4830459

PERSONAL PERSPECTIVES

To what extent to do agree or disagree with the following statements?	5	4	3	2	1	Total	
1. I am glad that this course was offered online.	60%	40%	0%	0%	0%	100%	
2. If this course had not been offered online, I would have commuted to a campus to take it in a classroom.	20%	20%	20%	10%	30%	100%	
3. I think I learned as much in this course as I would have if I had taken it in a classroom.	20%	20%	30%	30%	0%	100%	
4. I would participate in another online course as a result of this experience.	60%	40%	0%	0%	0%	100%	
5. I would recommend this course to others.	60%	30%	10%	0%	0%	100%	
6. The course workload was appropriate.	50%	30%	0%	20%	0%	100%	
7. The depth and breadth of topics was adequate for a one-credit graduate course.	60%	40%	0%	0%	0%	100%	
Student / Question	#1	#2	#3	#4	#5	#6	#7
1	5	2	2	5	5	5	5
2	5	1	5	5	5	5	5
3	4	5	2	5	5	5	5
4	5	5	3	5	5	4	5
5	4	5	5	5	5	5	5
6	4	3	3	5	5	5	5
7	5	1	4	4	3	4	4
8	5	3	5	5	5	5	5
9	4	1	3	4	4	2	4
10	4	4	2	4	4	2	4
Mean	4.50	3.00	3.40	4.70	4.60	4.20	4.70
Standard Deviation	0.5270463	1.6996732	1.2649111	0.4830459	0.6992059	1.2292726	0.4830459

APPENDIX CC
TAEO OVERALL COURSE OPEN-ENDED COMMENTS

Comments on Course Design & Technology:

- The problems with uploading the surveys were pretty annoying. Other than that, everything worked fine.
- This class was fine, but redundant for someone who graduated from the program. Perhaps it's my fault, but the class info sounded like it'd be new info. It wasn't.
- A good site. May want to have text more horizontal, instead of one, very long vertical column. Also include "printer friendly versions" of all text.
- Make the home page a link with "Course Home" on D2L instead of a link elsewhere
- It was a challenge for me to learn to use the website - but the course material was great. I wish I had more knowledge about using these kinds of technological services. I can see a real advantage to using them in the future (especially if I can get an on-line course put together to reach out to home-school students)
- This was just as adequate as other D2L course I have taken. Very easy to work with.
- Just great!
- Easy & user-friendly
- Too Many windows! Every time I clicked a link it opened in another window.

Comments on Course Content:

- See above comments. Again, I'm sure it's my fault for signing up. However, make it clear that this is the same old thing with the same old assignments the program offers.
- It fit the title - and as a pilot course, I think there is merit to the course. Could you possibly share other's ideas, especially unit 4? (these are the things that we might be able to incorporate into our curriculums).
- I think that rubric for each individual assignment would have been very helpful since the assignments were so different. I also feel as though the final assignment should have been laid out much more specifically.
- Great stuff. Lots of information I can actually use.
- Well put together; some unnecessary repetition.
- I liked going outside to investigate and try the activities first hand.
- The discussion board was a great way to share information.

Comments on Course Structure:

- Online discussions were all right, but I think the content was more useful.
- Karla was very attentive and encouraging.
- Communication was just as important in the learning process as the information provided.
- Great ideas
- I feel as though the final assignment seemed to encompass much more work but was not worth any more points than previous assignments. The weight attached did not equal the workload.

Comments on Personal Perspectives:

- In terms of recommending to others...only if they have no knowledge of EE. Anyone with any knowledge base would not learn anything new.
- Some of the "reading reflections" were repetitive.
- It is always nice to meet new people via on-line courses, and share ideas. I especially liked the fact that the content was practical in nature, and useable in the classroom. THANKS
- I think that teaching about the outdoors is very hard to learn about online and the instructor did the best she could forcing us to go outside, etc. I feel as though the course could have been more effective in person, but would not have taken it at UWSP due to commuting issues. I also felt like the workload was much heavier than other 1 credit course I have taken at Point.
- I like how the ideas seem so simple and so useful. Good, basic information for teaching outdoors.
- I have taken at least 8 on-line courses and this seemed to require a lot more than the typical on-line course. I felt like I had a lot to remember to do in a span of 1 week. The depth and breadth of topics and readings did not seem to match the required written assignments.
- Very interesting and informative. I will take what I learned here into the classroom.
- The workload was appropriate for a one credit class. It wasn't just read this and write a paper about it. It had real things we could use in our classroom. We actually had to move away from the computer to complete the assignments and go outside, just like the class suggests.

Did you find this course valuable? Please explain.

- Yes. I feel more confident incorporating outdoor ed into my Biology curriculum.
- Yes, when I find another teaching job, I will incorporate a lot of ideas, especially if the website is still accessible.
- Yes, it inspired me to try more outdoor education in my classroom.
- It was very valuable in that it gave me new methods and strategies to use with my students, not just theories and facts.
- Yes I did. The course gave me more resources to use with my class.
- YES - I found an outdoor camp in Almond, and I am going to use it with my classroom. I also found some very useable websites that I can go to in a hurry and pull off environmental information to use in class.
- I found this course somewhat valuable. It was a review of much that I had already learned in the EE master's program at UWSP, but I did find some good resources to add to my collection. It seems like it would best fit early in the master's program or for someone who doesn't have experience with teaching EE or a great undergrad course.
- Yes - many classroom ideas and information!
- Yes, It provided good ideas for my classes.

Do you feel your confidence with teaching outdoors has increased as a result of this course? Please explain.

- I have a couple more tricks to add to my bag.
- Yes. I feel as though I have more knowledge and more resources at my fingertips for teaching about the outdoors.
- I think so. Not only did we read about it, we actually experienced it with Unit 4.
- No, I was perfectly comfortable teaching outdoors.
- Now that I have new activities, I think my confidence has increased.
- Yes. I will use the outdoor activity as a kick off to the environmental science class that I am teaching this year.
- Yes - in the fact that I picked up new ideas to use outdoors. The journaling activity was what I was looking for - not necessarily a game or activity to do while outside, but a chance to observe nature and utilize one's senses and thoughts. It is valuable to go outside and sit and observe - you don't always have to have a strenuous agenda planned!
- Somewhat. After completing the master's program, I felt pretty confident, so this was basically a review.
- I feel like I had already been very comfortable in the outdoors, but teaching more of a variety of ways to accommodate all learning styles is something I certainly took with me from this class.
- Sure. I already felt comfortable.

If you are an educator, do you intend to use the information and activities from this course with your students? Please explain.

- A found a few ideas and activities that I liked. It also has me thinking about multiple intelligences.
- I will try to incorporate at least one additional activity this year in Biology. It's hard because we have a tight schedule on topics like human genetics don't lend themselves well to outdoor activities.
- Yes, I love incorporating the outdoors. Now I have more ways to do that and meet different benchmarks.
- I will use some of the websites for some of my units.
- I plan on taking them out to do journaling and gardening in the courtyard. I plan on using sensory learning outdoors.
- I will infuse this information not only into my environmental science class but my 9th grade physical science class as well.
- Yes, I have already made notes of activities that I will try this fall in my natural resource class. Journaling, the mapping idea, and hopefully we will visit the nature camp in Almond and go cross country skiing this winter.
- You bet. More than likely, I will use the information to share with other teachers, as I am in a resource teacher capacity.
- Yes. I got many new ideas from this course!
- Yes. Good ideas.

Please list at least one thing you liked about this course.

- I liked the Head Outside activities.
- The animal's perspective writing assignment. Attending an outdoor presentation.
- Head outside activities.
- I liked the discussion board where we can share ideas and offer encouragement.
- Sharing of information between people in the class.
- The practical aspect of the course. It didn't bog you down with reading tons of scientific information that you might never use - but it did offer plenty of resources if you wanted to read on.
- Ease of use and freedom to complete on my timeline.
- Getting outside as a part of each assignment!
- I like being able to do the work on my schedule.

Please list at least one recommendation for improving the course or instructional materials.

- I thought some of the assignment descriptions and requirements to earn certain points on an assignment were vague.
- Check for problems with uploading the surveys.
- NA
- Don't have any.
- Sharing of resources from the students teaching area to be included in a resource folder.
- Share the ideas from the dropbox - sometimes reading others' perspectives and reflections I can gain new ideas and see things in different ways.
- Some way, perhaps a weekly email, of the assignments coming up for the week.
- Although it was extremely well put together, online is a difficult way to teach about outdoor education.
- Less quoted material in the content pages.

Please provide at least one recommendation for improving the assignments.

- A more descriptive rubric for the final assignment would be very helpful.
- I like the interaction between teachers. Maybe push that a little more than one statement and one response.
- Make the assignments similar to the final assignment. Teachers need to be developing lessons anyway, I would have the assignments be something that they can use with their class!
- Don't divide the group by grades taught for the discussion on activities found.
- none
- Include a photo of the "thing" you observed in Unit 3 - or share some of the poems or other works that people did.
- Eliminate one of the components, for example, one discussion topic and one written assignment, perhaps presenting the Head Outside and Reflection as ONE component.
- Don't keep inserting the learning style / multiple intelligences in EVERY assignment. It's too much to re-explain every unit.

- Select discussion topics that are a little more engaging so I want to keep a conversation going.

Additional Comments:

- I enjoyed the class. Thanks for offering it.
- This has been one of my more useful grad courses. Thank you for being patient with my moving situation.
- Nice job, Karla. I really liked the concept of the course. If I hadn't participated in the Master's program already, it would've been a great introduction!
- Karla did an amazing job!
- I'm glad there was a class that had an appropriate workload as well as a class that gave me practical activities to use. Karla did a nice job offering comments after each assignment and grading them quickly.

~ UNLESS ~

But now that you're here
The words of the Lorax seem perfectly clear.

Unless someone like you cares a whole awful lot,
Nothing is going to get better, it's not

The Lorax by Dr. Seuss