International Electronic Journal of Environmental Education
Vol.3, Issue 1, 2013, 75-88
RESEARCH ARTICLE

Transforming Environmental Attitudes and Behaviours through Eco-spirituality and Religion

Jessica L. CROWE[1]
Georgia Military College, Valdosta, Georgia, United States

Received: July 2012; Accepted: *December, 2012*

Abstract

Incorporating spirituality and religious themes in environmental education is a way to link learners to their meaning systems. Research has shown that incorporation of a spiritual element in education provides a way for students to have authentic learning experiences and make meaning of the knowledge they acquire in the classroom. This mixed methods study examined the environmental attitudes, knowledge and actions of students in an introductory environmental science course with a spiritually infused curriculum at a community college. The quantitative data was collected from students in a survey of environmental attitudes, knowledge, and actions. Qualitative studies were conducted using a focus group to complement the quantitative data. Environmental education increases knowledge and awareness about earth's environment and teaches skills that lead to action that will ensure stewardship of all aspects of earth's environment. Integration of spirituality and religious traditions in environmental education offers an alternative approach in curriculum design that encourages learners' environmental attitudes and behaviors to be transformed.

Keywords: Environmental education, environmental attitudes, transformative learning theory, eco-spirituality, environmental behaviours

Introduction

The purpose of environmental education (EE) is to increase knowledge and awareness about earth's environment and teach skills that lead to actions that will ensure its protection (Withgott & Brennan, 2008). Traditional theories in the field of EE have suggested that teachers can foster changes in behavior by making students more knowledgeable. Research in the area of environmental behavior does not endorse that model, suggesting instead there are a variety of variables that influence behavior (Hungerford & Volk, 1990).

Developing methodologies that encourage students to critically examine their values is a challenge to environmental educators in the United States. Existing American practices promote overconsumption and subsequently resource degradation. Environmental educators integrate teaching strategies that encourage students to critically examine and

[1] Correspondence details: Jessica L. Crowe, Georgia Military College, Georgia, USA,
E-mail: jessica.crowe@gmc.cc.ga.us

ISSN: 2146-0329
© International Electronic Journal of Environmental Education, 2013

reflect upon their current attitudes and behaviors and encourage transformed attitudes that prove more justified to guide sustainable actions.

Incorporation of spirituality in the higher educational setting provides an additional way for students to construct knowledge, make meaning of experiences, and move toward authenticity, all contributing to transformation. For religious students, activities that contain spiritual components allow students to connect to their established practices. For students who are spiritual, but not affiliated with an organized religious group, these activities can serve as the inspiration for students to critically examine their existing environmental attitudes, question their assumption and beliefs, and through reflection and discourse, transform their view of their place, responsibility, and importance in the natural world.

The goal of environmental educators is to raise awareness about environmental issues and impart tools for realizing sustainable solutions. Mezirow's (1981, 1997, 1998, 2000) transformative learning theory is founded on the premise that values and beliefs change as taken for granted beliefs and opinions are critically examined and reflected upon and new, inclusive, and authentic beliefs are formed. In the environmental science classroom, transformation can be evidenced by improved environmental attitudes, intents, and actions.

Many learners increase their knowledge of environmental science, but do not change their personal actions to reflect a more sustainable lifestyle. The integration of spirituality in adult education has been successful in promoting authentic learning experiences and in helping students make meaning of knowledge that is gained in the classroom (Tisdell, 2003; Tolliver & Tisdell, 2006). Haluza-Delay (2000) suggested that educators who "ignore the spiritual side miss essential avenues for personal and social change" (p. 149). It is important to analyze the effectiveness of adding a spiritual dimension to environmental education to determine what teaching methodologies are the most successful at promoting transformation and ultimately behavior change. Knowledge of these teaching methods will enable educators to incorporate useful strategies to facilitate transformative learning.

Transformative learning was developed by Jack Mezirow (2000) as a constructivist learning theory in 1978. He defined transformative learning as a "process by which we transform our taken-for-granted frames of reference to make them more inclusive, discriminating, open, emotionally capable of change, and reflective so that they may generate beliefs and opinions that will prove more true or justified to guide action" (pp. 7-8). He stated the steps of transformative learning as the disorienting dilemma, critical reflection, reflective discourse, reflective action and perspective transformation. Transformation begins with a disorienting dilemma or event that causes an individual to question their assumptions or long held beliefs. Once the individual is faced with this event, critical reflection can take place. This is a solitary, private assessment performed by the individual to identify their long held assumptions and reflect upon their validity. Critical discourse then follows. The potential result of these events is perspective transformation. Mezirow (1997) described this as a change in a frame of reference. These frames of reference are described as "associations, concepts, values, feelings, [and] conditioned responses" (p. 5).

Current research in transformative learning theory is focused on methodology that can be implemented to encourage perspective transformations in learners. Mezirow (1997) suggested that adult educators create a classroom environment that is learner-centered, participatory, and interactive. Collaboration and critical assessment should be encouraged to explore real-life situations and problems in small group settings. Learners should be encouraged to use their own life experiences to assess and justify new

knowledge through learning contracts, case studies, role play, and classroom simulations. Adult learners should also be moving toward autonomy, in which the learner decreases his or her dependence on the educator and develops their own assumptions. In Taylor's (2007) review of literature he found that most studies suggest "providing students with learning experiences that are direct, personally engaging and stimulate reflection" (p. 182). Active learning, portfolios, and journaling are also powerful tools to promote transformation.

Tolliver and Tisdell (2006) suggested that learning is more likely to be transformative if it permeates one's whole self. This aspect of education includes the spiritual component of the individual. Much of Tisdell's research described how to incorporate a spiritual aspect into higher education. She specifically related spirituality as a way to foster transformation and paradigm shifts.

This study incorporated spirituality to promote transformation in environmental education. A main goal of environmental education (EE) is to increase student awareness of environmental issues and how their individual actions can affect our world. In 1969 Dr. William Stapp offered a definition of EE that has historically been accepted. He stated that "environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help people solve these problems, and motivated to work toward their solution" (Stapp, 1969). This was at the beginning of the modern phase of environmental policy in the United States, just one year before President Nixon signed the Environmental Education Act, which defined EE as the "educational process dealing with man's relationship with his natural and manmade surroundings, and includes the relation of population, conservation, transportation, technology, and urban and regional planning to the total human environment" (P.L. 91-516, 1970). A fusion of definitions creates a model of EE that includes awareness and sensitivity to the environment, environmental knowledge and understanding, an attitude of concern for the environment, skills to help solve environmental problems, and actions that lead to improved environmental conditions.

The purpose of EE is to produce an environmentally responsible citizen. Hungerford and Volk (1990) described this citizen as one who has an awareness or sensitivity to the environment, a basic understanding of the environment, motivation to improve the environment, skills to solve environmental problems, and active involvement in working toward solutions. Their research described a complex mix of twelve major and minor variables that contribute to an individual's environmental behaviors. These variables are categorized as entry-level variables, ownership variables and empowerment variables. They also examined critical educational components that promote learner behaviors, such as: teaching environmentally significant ecological concepts, providing opportunities for learners to achieve environmental sensitivity, teaching analysis and citizenship skills, and increasing learners' expectancy of reinforcement for acting in responsible ways.

Hungerford and Volk's (1990) environmental behavior model has been used extensively as a guide for environmental educators. However, several religious and spiritual elements could "contribute to and complement the influence and interaction of these factors" (Hitzhusen, 2006). Like the spiritual elements discussed above may enhance transformative learning, Hitzhusen suggests several spiritual elements that might catalyze the influence of the educational variables that lead to environmental citizenship behavior, including awe and wonder/sense of sacred at God's creation, religiously reinforced attitudes, love of creation, environmental justice knowledge, embracing stewardship vocation, knowledge of moral and ethical tenets, religious commitment and sense of call, religious environmental activism, faith and hope, participation in God's work, moral imperatives, legacy of social action and ethical influence, and acting out of love. No one variable, be it awareness, ownership, or empowerment related, should be expected to

sufficiently influence the learning process to make the difference in attaining environmental education goal, but a responsible combination of factors is more likely to be successful, and spiritual elements might enhance that success.

The goal of any EE teacher, whether in K-12 settings, higher education or community education, is to foster development of the above mentioned components and ultimately encourage individuals to make changes in their personal actions and their society. Some studies even suggest that universities for all programs include a course in environmental science to foster an environmental conscience (Kose, Gencer, Gezer, Erol, & Bilien 2010). Incorporation of spirituality in the environmental education classroom has the potential to foster transformative learning in post-secondary and adult learners and could lead to changes in environmental attitudes and behaviors.

Methods

This study used a mixed methods design to investigate the impact of spirituality on environmental attitudes and actions. Mixed methods research allows the researcher to further investigate initial quantitative results using descriptive, detailed qualitative approaches so that one form of data supports the other (Creswell, 2008). By incorporating a combination of both methods, there is a higher probability that complete answers to research questions and appropriate inferences from the findings can be achieved.

Surveys are often used to determine an individual's environmental attitudes (Schindler, 1999; Humston & Ortiz-Barney, 2007). The survey instrument for this study was given to freshmen students in an introductory environmental science class using a pre- and post-intervention protocol connecting environmental issues, attitudes, action and knowledge with course content. The questions incorporated a variety of survey items regarding environmental knowledge, action, and attitudes. It also included the New Ecological Paradigm (NEP) survey items, which come from an established survey instrument used to measure anthropocentrism or eco-centrism (Dunlap, Van Liere, Mertig, & Jones, 2000). Initial quantitative data was collected from the survey instrument regarding environmental actions, environmental attitudes addressing the relationship between humans, creation, and a divine power, and environmental knowledge. The quantitative data was collected the first day of the semester and again during the last week of the semester.

A focus group was used to collect qualitative data to complement the quantitative findings. Interview questions were designed following the procedure described by Krueger (1998) with a series of carefully planned opening, introductory, transitional, and key questions that were given to two groups of 12 students each. (Sample questions included: Has the course helped you gain knowledge about environmental behaviors? What actions have you changed in your daily life? Do you believe living an environmentally conscious lifestyle is a moral directive? Have your experiences in class broadened your perspectives? Please provide an example. Please comment on the spirituality portion of this course.)

The survey and focus group findings were used to determine the effect of a spiritual component in an environmental science class. Comparison of test group results with the control results determined if there was a significant difference between the class with an infused spiritual component and the class that is taught without those specified activities.

The control and experimental groups were given an identical syllabus outlining the chapters to be covered from the text. The control group completed all course components without any special assignments or discussions related to spirituality. Student activities in the control course included end of chapter questions and chapter content quizzes. The experimental group addressed the same course components with incorporation of special assignments, activities, discussions, and lectures with a spiritual component. One key component of the experimental class was that guided discussion covering all content

focused on the spiritual nature of the students' relationship with the environment. Also, the instructor shared personal experiences related to spirituality and environmental concerns. Both groups were administered the pre- and post-survey however the experimental groups participated in a focus group at the end of the semester. Significant improvements in environmental attitudes and actions were interpreted as transformation.

123 students completed the survey (*N* = 123). In the control group there were 36 students that took the pre-survey and 22 students that took the post survey. In the experimental group there were 34 students that took the pre survey and 31 that took the post survey. In the experimental group 24 students participated in the focus group at the end of the semester.

Description of Participants

The survey collected demographic data from all participants including age, sex, religious affiliation, frequency of religious meeting attendance, denomination (if applicable) and political orientation. These demographic variables have been found in the literature to have an impact on environmental attitudes and behaviors. Table 1 summarizes the findings.

Table 1.
Participant Demographic Summary

Group	Control Group		Experimental Group	
	Pre-survey	Post-survey	Pre-survey	Post-survey
N	36	22	34	31
Average Age	19	19	19	20
Males	12	5	24	23
Females	24	17	10	8
Religious Affiliation				
Protestant Christian	32	22	23	19
Catholic Christian	0	0	2	5
Hindu	0	0	1	0
No specific religion, but spiritual	2	0	6	5
No specific religion, not spiritually inclined	1	0	9	2

The Student Survey of Environmental Attitudes, Knowledge, and Behaviors was the instrument used to collect all quantitative data. The survey was given to the control and experimental group the first day of class and again the last week of class. The importance of giving the pre-survey on the first day of class ensured that all responses were based on the students' knowledge, attitudes, and behaviors prior to any exposure to course content. This survey was a collection of four separate survey sets that included 8 eco-spirituality items, 15 NEP items, 10 general environmental knowledge questions, and 12 environmental behavior items. Items related to environmental attitudes and actions were presented on a 5-point Likert-type scale. Attitudes were evaluated by the choices strongly agree, somewhat agree, unsure, somewhat disagree, or strongly disagree.

Results and Discussions

Quantitative Results: General Findings

Summative scales were used to obtain three separate scores for each student: an NEP score, an eco-spirituality score, and an environmental behavior score. Reliability of the scaled items was determined using Cronbach's Alpha. The NEP was .744, eco-spirituality .684, and environmental behavior, .770. The results showed that there was an increase in all areas except for environmental knowledge in the experimental group. The summary of mean scores for each group for four selected variables is presented in Table 2.

Table 2.
Mean Scores for Survey Items: Environmental Behaviors, NEP, Eco-spiritual Attitudes and Knowledge

Group	Environmental Behaviors (Range: 12-60)	NEP (Range 15-75)	Eco-spiritual Attitudes (Range 8-40)	Knowledge (Range 0-10)
Control Pre-survey (*N*=36)	35.22	48.88	28.47	4.03
Control Post-survey (*N*=22)	38.81	50.95	31.54	5.36
Experimental Pre-survey (*N*=34)	41.21	49.61	29.71	5.74
Experimental Post-survey (*N*=31)	43	54.25	31.67	5.65

Expected results for environmental behaviors, NEP, eco-spiritual attitudes and knowledge were that students in both courses would show measurable improvement. Also expected was that improvements in the experimental group would be larger than those of the control.

Environmental behavior

The environmental behavior scale was determined by the average score of 12 items. The range for the mean score was 12 to 60. As reported earlier, there was an increase in mean scores in the control and experimental group. Independent sample t-tests were conducted to determine if there was a significant difference between the groups. First, an independent samples t-test was conducted to compare the environmental behavior score of the control group and the experimental group on the pre-survey. This was done to determine if the two groups were significantly different before exposure to the course. There was a significant difference in the score for the control pre survey (M = 35.22, SD = 7.80) and the experimental pre survey (M = 41.21, SD = 7.55); t = -3.26, p = 0.002.

After completion of the course an independent samples t-test was conducted to compare the same score. There was a significant difference between the control post survey (M = 38.81, SD = 7.17) and the experimental post survey (M = 43, SD = 6.84); t = -2.15, p = 0.036. These results suggest that there was a significant difference between both groups at the beginning and end of the semester, with the experimental group consistently exhibiting a higher mean score for environmental behavior.

New Environmental Paradigm (NEP)

The NEP score was determined using a mean from the 15 item NEP survey. The range for the mean score was 15 to 65. There was also an increase in scores from the pre and post survey in both groups. An independent samples t-test was conducted to see if there was a difference between the groups at the start of the semester. Before exposure to the course, there was not a significant difference between the control (M = 48.89, SD = 8.09) and experimental (M = 49.62, SD = 7.95) group; t = -.38, p = 0.705. Although scores for both groups increased at the end of the semester, the differences were not significant between the control (M = 50.95, SD = 8.67) and the experimental group (M = 54.26, SD = 8.19); t = -1.41, p = -.164.

Eco-spiritual attitudes

The eco-spiritual attitudes scale consisted of 8 statements regarding humans, the environment and a divine power. The range of scores was from 8 to 40. Similar to environmental behavior and NEP, there was an increase in both groups when comparing the scores of the pre survey and post survey. An independent samples t-test was conducted to see if there was a difference between the groups at the start of the semester. Before exposure to the course, there was not a significant difference between the control (M = 28.47, SD = 6.51) and experimental (M = 29.71, SD = 6.95) group; t = -0.77, p = 0.446. Although scores for both groups increased at the end of the semester, the differences were not significant between the control (M = 31.55, SD = 3.56) and the experimental group (M = 31.68, SD = 6.03); t = -0.92, p = -0.927).

Environmental Knowledge

The environmental knowledge score was a mean of 10 questions. The range of scores was from 0 to 10. An independent samples t-test was conducted to see if there was a difference between the groups at the start of the semester. Before exposure to the course, there was a significant difference between the control (M = 4.03, SD = 1.62) and experimental (M = 5.74, SD = 1.56) group; t = -4.603, p = 0.000. The experimental group scored significantly higher at the beginning of the semester than the control group. At the end of the course, there was not a significant difference between the two group because the control group (M = 5.36, SD = 1.62) improved their scores and the experimental group's scores (M = 5.65, SD = 1.79) decreased. The t value for the post-survey was -0.585, with a significance of 0.561.

Qualitative Results: General Findings

The experimental group was divided into two groups of 12 students to participate in a final focus group. Two days at the end of the semester were selected to conduct the focus group. These interviews were held during regular class times; however, only those in the selected focus group met for that day. Interview questions were designed following the procedure described by Krueger (1998) with a series of carefully planned opening, introductory, transitional, and key questions. Sessions were audio-taped, transcribed, and subjected to in-depth thematic analysis to identify the significant themes that emerged from the data.

There were four major themes that emerged from the qualitative data. The first was reported behavior changes in the students based on knowledge acquired in the classroom. Another theme that emerged was the students' perception that there was a general lack of awareness of the public regarding environmental issues. This lack of awareness was also evident in the third theme to emerge, the spiritual mandate for environmental protection. Students reported that they believed there was a spiritual mandate for environmental responsibility, but they had never thought about it before this

class. The last theme to emerge was how personal experiences of the instructor inspired them in the classroom and in their personal life.

Analysis of Research Questions

The first research question was: Does the insertion of curricula oriented to eco-spiritual beliefs in the experimental group significantly alter students' environmental attitudes (NEP and eco-spiritual beliefs), environmental knowledge, or environmental behaviors when compared to the control class, thus exhibiting transformation? Based on the survey results, means for both the experimental and control classes increased in the environmental attitude scales and behavior scale. The knowledge score increased in the control class, but not in the experimental class.

There was a significant difference between the control group and the experimental group in the post-survey when analyzing environmental behaviors. However, there was a significant difference between the two groups at the beginning of the semester (t = -3.26, p = 0.002) with the experimental group scoring 9.9% higher on the behavior scale than the control group; therefore, it is not possible to determine if the post survey difference was from the spiritually infused curriculum or because the experimental group came into the class practicing more pro-environmental behaviors.

Although both groups showed a substantial increase in the attitude scales, during the post survey there was no significant difference between the two groups. There was a substantial increase in the experimental group concerning NEP, where the increase in the mean score was 6.2%, compared with 2.7% in the control group. The knowledge score increased in the control class over the course of the semester, but decreased in the experimental class.

The focus group data in the experimental class described the attitudes and behaviors of that group. When asked specifically about changes in their behaviors, students often responded positively that the knowledge they gained in the course encouraged them to change their behaviors. One student's comments show a transformation in their attitudes and behaviors after the course:

> A lot of us don't heat plastic anymore or anything like that. It's just—it's hard to think about all the little stuff we've changed now because it doesn't seem like we've done that much to change. It's just like, I'm not going to eat off plastic or I'm going to change out my light bulbs, just little stuff that makes a big difference.

Another student revealed how increased environmental knowledge helped foster behavior change: "We used [what we learned] to help change our habits the more we learned." One student's comment showed how discussions of eco-footprint and our moral obligation to reduce it affected their environmental attitude: "It makes you want to be more responsible for your part in the environment".

In response to a question regarding a spiritual mandate to protect the environment, one student responded: "People changed their mind about how we see things and realized we have to be more responsible. We are held accountable". This question also encouraged students to reflect on issues they had heard about in their churches. One student commented on the duality of stewardship: "Sometimes in churches you hear about stewardship and then you think, oh that's just giving money, but it's also taking care of what you've got that can't be replaced". When directly asked, one student admitted they were transformed by these ideas.

Q: Do you think spiritual beliefs should affect your attitudes about the environment?

A: They should, and like I said, up until this point I might not have really thought about that. So now they do because I'm trying.

Although the quantitative data showed improvements in the attitudes and behaviors during the course of the semester, there was no statistically significant difference between the control and the experimental group. The qualitative data expounded on the attitudes and behaviors of the students in the experimental group.

The second question was: To what extent are environmental attitudes or environmental knowledge predictive of pro-environmental behaviors? To determine the relationship between attitudes and behavior, Pearson product-moment correlations were computed between pro-environmental behaviors and environmental knowledge. Pearson *r* was also computed between pro-environmental behaviors and environmental attitudes (NEP and eco-spiritual). Prior to conducting correlation procedures, the scatterplot was examined and was suggestive of a linear relationship between the variables.

The correlation between knowledge and behavior was not significant ($p = 0.234$), with a Pearson Correlation of $r = 0.108$. It is assumed there is not a strong relationship between knowledge and behavior. However, a stronger correlation was found between attitudes and behavior.

The correlation between the NEP scale and pro-environmental behavior was significant ($p = 0.005$) with $r = 0.253$. Eco-spiritual attitudes had the highest correlation with behavior, with an $r = 0.257$ ($p = 0.004$). This relationship was still weak. Squaring the r value indicated that eco-spiritual attitudes and pro-environmental behaviors overlapped 6.6%. Table 3 summarizes the four-variable bivariate correlations.

Table 3
Pearson Correlation Among Knowledge, Attitude, and Behaviors

	Environmental Behaviors	NEP	Eco-spiritual Attitudes	Knowledge
Environmental Behaviors	1	.253**	.257**	.108
NEP	.253**	1	.259**	.323**
Eco-spiritual Attitudes	.257**	.259**	1	.028
Knowledge	.108	.323**	.028	1

**Correlation is significant at the 0.01 level

The third research question was: What role do socio-demographic factors play in the relationship between environmental beliefs and behaviors? The literature has shown two factors that strongly affect environmentalism: political ideology and religiosity. These are the two demographic factors that were analyzed. In order to determine the effect of these variables on environmental attitudes and behaviors, a partial correlation between attitudes and behavior while controlling for political ideology and religious service attendance was calculated. Table 4 summarizes the results the partial correlation while controlling for religious service attendance.

Table 4
Pearson Partial Correlation Among Attitude and Behaviors, Controlling for Religious Service Attendance

	Environmental Behaviors	NEP	Eco-spiritual Attitudes
Environmental Behaviors	1	.261**	.280**
NEP	.261**	1	.272**
Eco-spiritual Attitudes	.280**	.272**	1

**Correlation is significant at the 0.01 level

When controlling for religious service attendance, there was a slight increase in the correlation between environmental attitudes and behavior. This suggests there may be a slight negative impact of religious service attendance on environmental attitudes and behavior, however the correlation is still weak.

When controlling for political view, the correlation became even weaker, suggesting that political ideology may have more of an impact than religious attendance. The correlations are still very weak, with the correlation between environmental behavior and eco-spiritual attitudes falling below a significant level. Table 5 summarizes these findings.

Table 5
Pearson Partial Correlation Among Attitude and Behaviors, Controlling for Political View

	Environmental Behaviors	NEP	Eco-spiritual Attitudes
Environmental Behaviors	1	.242**	.230
NEP	.242**	1	.248**
Eco-spiritual Attitudes	.230	.248**	1

**Correlation is significant at the 0.01 level

Emergent Themes

Thematic analysis involved the identification of themes through careful analysis of the focus group data. It involved recognition of recurrent topics within the data, where these themes became the categories for analysis. Oftentimes themes occur in the focus group that were not anticipated or expected. In this section two emergent themes will be discussed.

One emergent theme from the focus group results was the students' admitted lack of environmental awareness. In spite of no questions that addressed it, this topic had more comments than any others during the focus group. Not only did the students comment on their lack of environmental awareness, they extended this deficiency to the general public (ex: "Everybody really needs to take this because if you don't take the class you really don't know, you're not aware"). Their comments suggest that their environmental attitudes and behaviors were deficient due to lack of environmental awareness.

Another emergent theme from the focus group was the positive impact of the instructor's shared personal experiences. Jacobs (1998) stated that sharing personal experiences with students can help them "make sense of their own increasingly fragmented, partial, and unstable perceptions and practices and work toward creating more powerful understandings and actualizations of agency" (p. 222). The students commented that personal experiences helped them understand environmental principles.

Conclusions of Findings

This study examined course components of an introductory environmental science class to determine if (1) transformative learning occurred, as evidenced by improved environmental attitudes and actions and if (2) incorporation of a spiritual component positively contributed to personal transformation. Environmental attitudes, measured by the NEP and eco-spiritual attitude scale, and environmental behaviors improved in both the control and experimental class, indicative of transformation. The experimental class did not show statistically significant improvements over the control class on the attitude scales, although increases in the NEP score were notable at 6.2% (compared to 2.8% in the control group). The NEP is one of the most popular surveys used to assess pro-environmental opinions. High scores on the NEP scale should indicate a pro-ecological orientation that leads to pro-environmental beliefs and attitudes on a wide range of issues.

There was a significant difference between the environmental behaviors of the control and experimental class on the pre survey and post survey with the experimental class scoring higher each time. It is difficult to determine if the classroom curriculum or existing pro-environmental behaviors were responsible for the differences. Nonetheless, improvements occurred in all areas in both classes. When some participants realized their faith tradition did in fact promote environmental stewardship, their attitudes were transformed and that often resulted in behavioral change.

Ajzen and Fishbein's (2005) theory of reasoned action demonstrates a link between attitudes and behaviors. In this study, pro environmental attitudes were slightly predictive of pro environmental behaviors, although these correlations were weak. Attitudes have been found to be predictive of behavior in many fields, however these relationships are complex and dependent on many external factors that may not be known to the researcher. Controlling for religiosity and political orientation did not have a substantial impact on the correlation between attitudes and behaviors. For religiosity, this could be due to the homogeneity of the sample, in which 76% of the students identified themselves as Protestant Christians, many of which were regular attenders.

A major theme of the focus group was the students' admitted lack of environmental awareness. They often commented that they did not have certain pro-environmental attitudes or behaviors simply because they were not aware of fundamental environmental principles before taking this course. This is important to note as it relates to the first three steps of transformation in Mezirow's learning theory: the disorienting dilemma, self-examination, and critical assessment of assumptions. For some students, gaining knowledge about the environment and environmental problems was an awakening. While adolescence is a phase in which individuals learn to be critically reflective about others' beliefs and assumptions, adulthood provides an opportunity to questions one's own assumptions. It was evident that students in the course were challenged to redefine their ideas about living a sustainable lifestyle. In many cases this resulted not only in an elevated environmental consciousness, but the integration of this awareness into their daily activities.

The use of personal experiences of the instructor emerged as a key component of active and engaged learning by the students. Many participants commented that they were able to relate better to the information when it was presented in the context of "real life". It also

inspired the students to examine their own lives to see how environmental knowledge could impact their decisions. The transparency of the instructor helped reduce the distance between the student and instructor and challenged the established notions of the teacher as an infallible expert. Students were also encouraged to defy the passive acceptance of knowledge and make decisions based on the lived experiences of others. This is a core concept of Mezirow's transformative learning theory.

Modern environmental problems will never be effectively addressed until citizens fully grasp the necessity of a healthy environment. Declines in environmental awareness and concern show that the United States needs a new focus in the field of environmental education. Acquiring an environmental education in a setting that encourages critical reflection on the role of humans in the world and promotes a holistic connection to our planet has the potential to produce a citizenry that practices sustainability in every area of their lives. Transformative learning is a tool that has the capability to implement lifelong changes and paradigm shifts that promote environmental protection rather than apathy. The role of spirituality in such processes needs further study.

▪ ▪ ▪

Acknowledgements
The author would like to thank Dr. Carl Hand, professor of Sociology at Valdosta State University and Dr. Gregory Hitzhusen with the school of Environment and Natural Resources at the Ohio State University.

Biographical statement
Dr. Jessica Crowe is currently an assistant professor of Biology at Georgia Military College in Valdosta, GA, in the United States. She is interested in the role of spirituality in education and innovative curriculum in environmental education. E-mail: jessica.crowe@gmc.cc.ga.us

References

Ajzen, I., & Fishbein, M. (2005). The influence of attitudes on behavior. In D. Albarracín, B. T. Johnson, & M. P. Zanna (Eds.), *The handbook of attitudes* (pp. 173-221). Mahwah, NJ: Erlbaum.

Creswell, J. (2008). *Educational research: Planning, conducting, and evaluating quantitative and qualitative research* (3rd ed.). Upper Saddle River, NJ: Pearson Education.

Dunlap, R., Van Liere, K., Mertig, A., & Jones, E. (2000). Measuring endorsement of the new ecological paradigm: A revised NEP scale. *Journal of Social Issues,* 425-442.

Haluza-Delay, R. (2000). Green fire and religious spirit. *The Journal of Experiential Education, 23*, 143-150.

Hitzhusen, G. (2006). Religion and environmental education: building on common ground. *Canadian Journal of Environmental Education, 11*, 9-25.

Humston, R., & Ortiz-Barney, E. (2007). Evaluating course impact on student environmental values in undergraduate ecology with a novel survey instrument. *Teaching Issues and Experiments in Ecology, 5*.

Hungerford, H. & Volk, T. (1990). Changing learner behavior through environmental education. *Journal of Environmental Education, 21*, 8-24.

Jacobs, W. (1998). The teacher as text: Using personal experience to stimulate the sociological imagination. *Teaching Sociology, 26*, 222-228.

Kose, S., Gencer, A., Gezer, K., Erol, G., & Bilen, K. (2010). Investigation of undergraduate students' environmental attitudes. *International Electronic Journal of Environmental Education, 1*, 85-93.

Krueger, R. (1998). *Questions for Focus Groups*. London: Sage Publications.

Mezirow, J. (1981). A critical theory of adult learning and education. *Adult Education Quarterly, 32*, 3-24.

Mezirow, J. (Summer, 1997). Transformative learning: theory to practice. *New Directions for Adult and Continuing education, 74,* 5-12.

Mezirow, J. (1998). On critical reflection. *Adult Education Quarterly, 48*, 185-199.

Mezirow, J. (2000). *Learning as transformation: Critical perspectives on a theory in progress*. New York: Jossey-Bass.

Schindler, F. (1999). Development of the survey of environmental issue attitudes. *Journal of Environmental Education, 30*, 12-16.

Tisdell, E. (2003). *Exploring spirituality and culture in adult and higher education*. San Francisco: Jossey-Bass.

Tolliver, D. & Tisdell, E. (Spring, 2006). Engaging spirituality in the transformative higher education classroom. *New Directions for Adult and Continuing Education, 109*, 37-47.

U.S. Public Law 91-516 (1970). *The Environmental Quality Education Act*. Enacted October 30, 1970, 1.

Withgott, J. & Brennan, S. (2008). *Environment: The science behind the stories* (3rd ed.). San Francisco: Pearson Education.

International Electronic Journal of Environmental Education
Vol.3, Issue 1, 2013, 75-88
RESEARCH ARTICLE

Maneviyat ve Din Yolu ile Çevresel Tutumların ve Davranışların Dönüşümü

Jessica L. CROWE[†]
Georgia Military College, Valdosta, Georgia, United States

Alındı: Temmuz 2012; Kabul Edildi: Aralık, 2012

Özet

Çevre eğitimine maneviyat ve din temalarını dahil etmek öğrenenlerle anlamlandırma sistemleri arasında bağ kurmanın bir yoludur. Araştırma, manevi ögelerin eğitime dâhil edilmesinin öğrencilere gerçek öğrenme deneyimleri sağlamanın ve sınıfta öğrendikleri bilgiyi anlamlı hâle getirmenin bir yolu olduğunu göstermektedir. Karma yöntemle yapılan bu çalışma, içeriği manevi ögeler entegre edilmiş bir programla hazırlanmış olan çevre bilimine giriş dersine devam eden öğrencilerin çevre bilgisi, çevreye karşı tutum ve davranışlarını incelemektedir. Çalışmanın nicel verileri, çevreye karşı tutum, çevre bilgisi ve davranışlarını içeren bir anket yolu ile toplanmıştır. Nitel veriler ise nicel verileri tamamlayacak şekilde odak grup çalışmaları ile toplanmıştır. Çevre eğitimi, öğrencilerin çevre bilgisini ve çevre farkındalığını arttırmakta ve çevreye sahip çıkmalarını sağlayacak eylemleri ortaya çıkarıcak becerileri öğretmektedir. Maneviyatın ve dini geleneklerin çevre eğitimine dâhil edilmesi ise program tasarımında öğrencilerin çevreye karşı tutumlarını ve davranışlarını değiştirmelerini teşvik edecek alternaf bir yöntem sağlamaktadır.

Anahtar Kelimeler: Çevre eğitimi, çevreye karşı tutum, çevresel davranış, dönüşümsel öğrenme teorisi

[†] Sorumlu Yazar: Jessica L. Crowe, Georgia Military College, Georgia, USA,
E-posta: jessica.crowe@gmc.cc.ga.us

ISSN: 2146-0329
© International Electronic Journal of Environmental Education, 2013