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Contrasting Immersion and Consultation Service-Learning Pedagogies: a Step Towards Reconstructing Personal Values and Norms

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HUXLEY
COLLEGE OF THE ENVIRONMENT

Thesis Title

*Contrasting Immersion and Consultation Service-Learning
Pedagogies: A Step towards Reconstructing Personal
Values and Norms*

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Date: March 17, 2011

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Thesis REPORT

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ABSTRACT

Contrasting Immersion and Consultation Service-Learning Pedagogies: A Step Towards Reconstructing Personal Values and Norms

Connor Harron

The purpose of the current research was to examine the effects of two different environmental education programs on participants. In doing so this thesis assessed a Western Washington University study abroad program (Rainforest Immersion and Conservation Action) and a second WWU course, ESTU 436 environmental impact assessment. Both courses use service learning as a way to allow students to actively engage in the learning process and apply knowledge learned in the classroom to real world issues. Although similar in structure, the RICA program benefits from providing an immersion experience and a multi-disciplinary approach. The author hypothesized that participants in the RICA program would display increased value reconstruction compared to students in ESTU 436 due to the holistic approach taken in the RICA program. Results were analyzed from three different methodological approaches. The results from all three approaches support the hypothesis. This research adds new lenses through which to view environmental education, and builds upon previous research that has combined multiple approaches to improve results. This research benefits the environmental movement as a whole. It also benefits individuals such as: educators, researchers, environmental organizations, and any other individuals seeking to improve their attempts to foster pro-environmental change.

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Chapter 1- Introduction

Our Chapters in Nature

As we go through our lives we progress with the experiences that are allotted. In essence, these compilations of memories and interactions tell a story, they represent the book that is our lives. When we tell our stories the chapters that take up the most space in our books are not necessarily the ones that took the longest to complete. These experiences can affect us in drastically different ways. Depending on a nearly infinite number of variables certain chapters will set the framework for our book, while many others will be left out of the main plot, playing minor roles in the backdrop of the larger theme. In a similar way our books have main characters that develop throughout the story, special appearances with dramatic effect, and extras that fill the empty space. How the book will conclude depends on what chapters have the most influence, and on which characters play the main roles.

My own interest in stories has lead me to pursue a career studying one chapter that is becoming increasingly absent in many peoples lives. In historical terms, until very recently humans have lived and evolved in an exclusively natural environment. In effect, the natural world was a part of every chapter of our stories. However, over the last several hundred years natural spaces have been replaced with mono crop agriculture and built environments. Today less than five percent of all land on this planet is not under direct human influence (Baskin, 1997). This fact has dire implications for humans and the planet alike. Louv (2005) described this situation in depth in his book, *The Last Child in the Woods*. Here he coined the term nature deficit disorder to describe our lack of

connection with the biological world. If we do not know nature, then who will notice its disappearance? If we do not love our planet who will care for its wellbeing? If we lose nature what will we lose with it?

These questions have no simple answer, yet they are important ones to ask. However, for now we must focus on what we can answer. In order to prevent the disappearance of natural environments from this planet it is necessary to bring nature back into our stories. This thesis is an overview of a chapter that has been introduced into many stories in the past. The *Rainforest Immersion and Conservation Action (RICA)* program in Costa Rica is an experience that many participants describe as a very powerful chapter in their stories.

RICA a True Immersion Experience

This thesis will compare two different environmental programs. In contrast to the RICA program this study will explore another Western Washington University course taught by the same instructor. This 400 level course focuses on environmental risk assessment and urban environments. Students in this course participated in service learning. As part of the course students worked with two different local organizations in order to develop plans that would be used for infill development in the city of Bellingham Washington. In this way students had the opportunity to apply their knowledge from the classroom to real world problems with the prospect of making real significant change (Abel, 2010).

The RICA experience on the other hand is a five weeklong study abroad program through Western Washington University that is comprised of three separate courses: Environmental Peace and Sustainability, International Conservation Issues, and International Environmental Research Experience. Environmental Peace and Sustainability introduces students to the importance of social justice in combination with environmental justice. Students address topics such as regional stability, environmental conflicts, and social inequality as one of the driving forces of environmental destruction (Abel, 2011). International Conservation Issues attempts to help students combine their understanding of civic relations with those of environmental considerations. Students participate on a group project with hands on service learning and work to reconcile individual interests with conservation ones (Abel, 2011). In the final course, International Environmental Research Experience, students are not only expected to participate in gathering empirical data to increase information on biodiversity and environmental stability, but also to apply their findings to the challenges posed by current policies and programs. The students work hands on with locals to develop a more realistic perspective of the situation, and are asked to create solutions that account for the different parties that will be affected by them (Abel, 2011).

Before students leave for Costa Rica, each participant is paired into four separate research groups. Each group is responsible to conduct their own project during the course, write up their findings, and present them at the University for Peace in San Jose at

the end of the program. In 2010, the groups were divided into four teams: the bird team, the botany team, the biogeography team, and the education team.

The bird team used sophisticated audio recording equipment and spot counting to measure the quantity and diversity of birds at different locations throughout the program. Their findings are used to help National Parks in Costa Rica identify bird densities and target areas for increased conservation. The botany team performs vegetation density calculations by measuring tree width and height as well as identifying the number of different species within a given plot. This research helps to measure the transition of forests on disturbed plots that are relatively young compared to more mature forests that have been largely preserved for a long period of time. The biogeography team uses satellite technology in juncture with digital photography to map trails and animal sightings. The resulting information helps create more accurate trail maps for the parks, and creates a biodiversity map, which shows the types and quantities of animal sightings along the trail systems. Finally, the education team creates and implements an environmental education curriculum to teach local students about the importance of preserving biodiversity and showing them what they can do to help.

At the beginning of the program students immediately travel out of the city to rural areas on the Pacific side of the country. At each location students are presented with unique as well as common challenges facing those ecosystems and the people that interact with them. In addition, students engage with the local populace and learn from them about problems on the ground as well as successful strategies that have positive impacts. Students are required to engage in daily discussions about the course and the

issues brought up by each encounter. In addition each student is required to keep a daily journal by answering prompts which encourage the students to delve deeper into the content of the course, and develop a true understanding of the complex systems that surround environmental problems.

In addition to the curriculum, students foster relationships with local Costa Ricans or Ticos. This is the first experience for many students outside of the United States; so fostering these diverse connections is an important way for students to develop a deeper appreciation for the difference in lifestyles that they experience while in Costa Rica. It is easy for many Americans to go into a place like Costa Rica with a sense of superiority. One of the main goals of the RICA program is to break down these notions, and to instead foster an attitude of humility and equality towards those previously viewed as underprivileged.

What's at Stake?

As stated in the Intergovernmental Panel on Climate Change's (IPCC) fourth assessment report, the planet's climate is warming at an unprecedented rate, and humans are responsible for the large majority of causes creating this situation. As global populations continue to rise, communities are being impacted by resource degradation due to waste disposal and consumption patterns (Tedesco & Salazar, 2006). In addition, large amounts of biodiversity are being lost at an unprecedented rate (Röttgen, 2010). In 2010 the United Nations declared it the international year for biodiversity

in order to promote the protection of one of the planets greatest assets, diversity. If communities are to preserve longevity and quality of life, they will have to create systems of management for these resources in a way that can support both its people and its environment (Dobson & Bell, 2006; Kelly, 2006; Tedesco & Salazar, 2006).

Over the last several decades the environmental crisis has increased in saliency across the world. Many individuals and even nations are beginning to recognize the importance of conservation, and support the environmental movement (Bosso, 2005; Guber, 2003; Kyoto Protocol, 1997). Unfortunately, in most nations this increase in public concern about environmental issues has not resulted in significant behavior and/or policy changes that seek to minimize environmental impacts (Guber, 2003).

This paradox is the result of many issues. However, one in particular lies in the nature of environment problems. As Garrett Hardin (1968) first described, environmental problems are tragedies of the commons. He illustrated when humans are great at weighing the cost and benefits of a given action. This happens most often when the costs and benefits are both carried by the self, and when those consequences happen within the immediate context of the action. However, when the individual experiences the benefits of an action, yet the burden of the consequences is left to the group or society at large, we do very poorly at recognizing the negative impacts of the action. Further, if those consequences aren't felt for years or even decades, then the individual will probably experience little to no inhibition to the behavior or guilt there after.

This is what occurs with environmental problems. When individuals make choices that affect the environment, it is very hard to perceive the magnitude of the consequences because the effects are delayed for decades. Further, its impact may be felt in a completely disparate location compared to where its cause was released. In this context it becomes very difficult to motivate individuals to make their behaviors consistent with their beliefs (Gardner & Stern, 2002; Hardin, 1968). Environmental problems are unlike any major issue that humans have had to overcome before (Gardner & Stern, 2002). In the past humans have had the opportunity to react to problems where the effects have been self-evident. However, with the environment, if we wait until those same effects are widely apparent, it will be too late to avoid widespread catastrophe (Gardner & Stern, 2002).

Thesis Goals, Research Hypothesis

For the rest of this thesis, the pursuit of sustainability or sustainable behaviors will be defined as methods of using a resource where it is not depleted or permanently damaged, and living in a way that uses sustainable approaches (Merriam-Webster, 2010). In the past, many sustainable education programs focused on providing clear, straightforward education and information (Geller, 1981; Hutton, 1982). These programs were shown to increase participant's motivation and knowledge directly after, but resulted in little to no actual behavior change or attitude adjustment (Geller, 1981; Hutton, 1982). As research has evolved on sustainable practices, a great deal has been learned about effectively promoting pro-environmental beliefs and behaviors.

Several factors help determine whether an individual will be persuaded to become involved in conservation. Stern and Oskamp (1987) developed a model that represents different factors that may prevent an individual from changing environmentally maladaptive behaviors. These barriers include seven levels. The first is household background, which can be described as traits such as family history, education and income. The second level includes external incentives and constraints; these are characteristics about our surroundings that impact the difficulty or possibility of performing sustainable behaviors. Values and worldviews are a third level and include personal philosophies, religious preferences, and living in bio-centric vs. ethno-centric manners. Next are attitudes and beliefs that encompass how individuals perceive others behavior or whether or not someone is concerned about environmental problems. The fifth level, knowledge, pertains to understanding how to reduce ones environmental impact as well as understanding the consequences of not acting. Paying attention to when conservation behaviors are possible/appropriate is the sixth level. If an individual does not notice when action is possible, than even good intentions may lead to little actual change. Finally, if no barriers exist between levels one and six, resource-using/saving behavior may occur. When this happens the individual is more likely to be receptive to a personal sense of responsibility for acting in sustainable manners (Stern, Dietz, Abel, Guagnano, & Kalof, 1999).

One thing this model suggests is that the barriers to promoting environmental behaviors are many. They are complex, and they range from a variety of sources that span all aspects of an individual's life. This illustrates that for any environmental

pedagogy to promote long term significant behavior change it will have to do more than target knowledge, ease of use, or external incentives. The social structure of society helps construct the core of ones identity, and in this culture it is infused with several barriers that prevent sustainable practices (Hines, Hungerford, & Tomera, 1987; Stern & Oskamp, 1987).

Researchers have found that taking an eclectic approach to promoting sustainability has been more effective than any single motivator (Gardner & Stern, 2002; Hirst, 1987; Hopper & Nielsen, 1991). However, this approach has largely been limited to promoting single behaviors. In order to promote wide spread change, research needs to address more stable traits such as values, attitudes, and personal norms in addition to individual behaviors.

In conjunction with Stern et al.'s (1999) value, belief, norm theory for environmentally significant behavior, this work seeks to show that multi-disciplinary pedagogical approaches can improve attempts to foster long-term identity change. The author proposes that this occurs in a similar way that combined approaches help to improve attempts to promote specific behaviors. The Stern et al. (1999) value, belief, norm theory will be illustrated and defined below at the end of the overview of the literature. To be succinct, the theory postulates that individuals who value an object, believe that it is in danger, and maintain a sense of personal obligation to protect that object will act in a way to preserve or save the given item. In order to promote long-term change, pedagogies should attempt to activate these values, beliefs, and norms in the context of sustainability.

This thesis seeks to build upon previous research combining several different approaches, and illustrate that in conjunction with pedagogical approaches, the fostering of mutually positive social connections can serve as a catalyst for ideological transformation among student participants. In other words, the RICA program can be thought of as a pedagogical experience that seeks to foster personal responsibility and belief change through the fusion of several different educational approaches. In addition, RICA promotes the development of many rich contacts with local communities as a way to reinforce the shift of perspective being promoted. The remainder of this work will be dedicated to answering the research question: Does the holistic and immersive approach of the RICA program have an effect on participant attitudes and beliefs above and beyond that of a similar environmental curriculum? The author hypothesizes that participants in the RICA program will show greater value reconstruction than students in the comparison group due to its immersion qualities and the numerous interpersonal connections that it fosters between participants, Costa Ricans, and the environment.

This thesis is divided into four main sections. Chapter two is composed of a literature review. In particular it highlights research on pedagogical approaches included in the RICA program, and concludes by integrating this research and illustrating how the combination of these approaches can effectively foster social growth. Chapter three described the methods used to create this study. Chapter four presents the results of the different variables in this study. And finally, chapter five discusses the findings and implications of this study in addition to suggesting future research considerations.

Chapter 2: Overview of the Literature

Service Learning

For the rest of the article, service learning will be defined as a method of education by which students explore and grow within a thoughtful and reflective service environment that: (1) is conducted within a community to meet the needs of that community and is coordinated in conjunction with both an institution of higher education as well as the community being served; (2) promotes increased civic responsibility; (3) is designed alongside the education curriculum in order to improve upon and enhance the learning experience; (4) and provides allotted time for students to reflect upon the service experience (Robinson, 1992). When describing the RICA program, it is appropriate to use this definition for environmental service learning with the caveat that the focus of serving community needs comes in the form of addressing environmental concerns for the given population.

By putting more emphasis on this type of “community-based experiential learning” higher education can improve student learning, civic engagement, alter the epistemology of the institution, increase social, cultural, and human capital for both communities and universities, and improve upon our attempts to address social issues (Peterson, 2009; Shumer, 1994; Shumer & Duckenfield, 2004). This type of education allows universities to address student educational requirements while helping the students address cross-disciplinary community needs that ground the students experience in something real and tangible. Because solutions in the real world are complex, students need to work together with individuals from different expertise, which can help them

develop an appreciation and understanding of unfamiliar disciplines (Furco & Root, 2010; Heinisch & Hartman, 2003). One of the distinctions between service learning and volunteerism is the concept of reciprocity (Astin & Sax, 1998; Epstein, 2005; Eyster & Giles, 1999; Furco, 2002; Peterson, 2009). Service learning projects involve meeting the immediate needs of the student, and by doing address the needs of the community.

Educational theorists John Dewey, Paulo Freire, and David Kolb are famous in part for their reconstruction of an ideal educational pedagogy. They did away with the idea that an instructor serves as a provider of knowledge into waiting empty minds. Education they say is not something that is done or given to you, it is something that is created through mutual partnerships and with the exchange of thought provoking ideas (cited in Peterson, 2009). In the Words of John Dewey, “Education is a social process. Education is growth. Education is, not preparation for life; education is life itself.” In this way classroom learning is a barrier to true education because it serves to isolate students from the action and participatory nature of true learning. Service learning overcomes with these barriers by requiring that students actively apply and adapt knowledge according to realistic restraints and demands.

In reference to the above educational theorists, Peterson (2009) states that:

All of these theorists contend that learning is something gained through action and relationships with others, with ideas, and with one’s surrounding environment; equally affected by self-knowledge and control, interpersonal relationships, community involvement, engagement with theories and literature, and the social issues of one’s society. Experiential

learning in the community enhances cognitive development and provides a fundamental shift from knowledge as self-interest and private good... to knowledge as civic responsibility and public work. (p. 543)

These experiences are most successful when students spend extensive periods of time with the community, assist on specific projects and research, participate in community social events, spend time reflecting on ones own participation in the group and on the potential outcomes for the community or similar groups at large (Eyler & Giles, 1999; Mabry, 1998; Peterson, 2009). Mabry (1998) found that the duration and intensity of service had a strong correlation to the lasting impacts of the course. Students who spent time doing service for at least 15 to 20 hours, had frequent contact with those they were serving, and participated in weekly reflection reported years later that their internships had a dramatic impact on their lives.

Service learning programs have also been shown to increase student engagement in the classroom and improve grades compared to students not involved in service learning by 4.8% (Strage, 2004). Furco and Root (2010) found that through service learning students increased engagement, improved achievements in reading and language skills, had more motivation and held more positive attitudes.

Reflective Journaling and Regular Dialogue

One of the common findings that research on service learning has found is that by it self, performing service is not enough (King, 2004; Peterson, 2009). Many presume that the act of serving the needs of a community creates an outlet for students to develop

a deeper appreciation for the challenges and struggles that many people must go through. It puts them in the right time and space to re-examine their own culturally defined beliefs and actions, and put that into context with the realities of the world they are confronted with. However, the majority of students will not do this on their own (King, 2004; Kolb, 1984; Maher, 2003). Humans are reluctant to challenge their own ideologies because so much of our self worth and confidence stems from those beliefs (Boyle-Baise and Sleeter, 2000). Because of this researchers are pressed with a complex challenge to effectively reconstruct ones worldview while maintaining a positive sense of self (Boyle-Baise and Sleeter, 2000; King, 2004).

Successful service learning programs are able to motivate students to critically reflect about their experience and attitudes, and to engage in dialogue with their peers about the impacts of the course (Elyer, 2001; King, 2004; Kolb, 1984; Peterson, 2009). Researchers have described numerous effective activities, including writing, speaking, listening, and drawing (Elyer, 2001; Kolb, 1984). The key here is that long-term learning and integration occurs through a cycle of participatory action and reflection (Elyer, 2001; Kolb, 1984; King, 2004; Maher, 2003).

Pairing weekly commitments to community service with equal time dedicated to group dialogue and reflection about their service experiences can improve both civic and educational outcomes for students (Mabry, 1998; Peterson, 2009). Giles and Elyer (1994) found that using dialogue and writing to critically reflect upon the experience could serve to solidify ones commitment and belief in their ability to make a positive impact on the world and to use more altruistic reasoning. Further, when combined with

guidance and comments from professors and/or local partners the effects of the reflection process can be enhanced (Greene & Diehm, 1995). To summarize, Eyler, Giles, and Brazton (1997) found that “when students are directly involved with people experiencing the social problems they are studying or agencies working with these problems, they change the way they think about the issues (pg. 13).” Not only do students adjust their beliefs and attitudes throughout the program, many of them become more aware of their beliefs and articulate them more clearly due to service immersions (Maher, 2003).

As we have seen with global warming and other issues, often times when humans are presented with large problems that seem overwhelming we often deny that the problem exists rather than confronting the issue head on (Boyle-Baise & Sleeter, 2000). However, as the researchers in this section have shown, engaging students in a critical reflective process can help participants to acknowledge the disparity between their preconceived cultural notions and the realities of the world they are confronted with (King, 2004; Maher, 2003; Peterson, 2009). This recognition is crucial if any long term behavior and belief change is to result from a service-learning program (Eyler, 2001; King, 2004; Krans & Rourke, 1994; Peterson, 2009).

Deconstructing Notions of Cultural Superiority, “Defamiliarization” in Novel Environments

Although service learning has been shown to have many positive impacts, the methodology is not without critics. Erickson and O’Conner (2000) claim that often times the benefits of service learning voiced by its proponents often fail to be realized when

implemented. Instead of acting as a vessel to promote reciprocity, critics argue that many of these programs actually reinforce the notion of cultural superiority and disparity gaps between the servers and those being served (Erickson & O’Conner, 2000; Cruz, 1990; King, 2004). It is too often the case that service learning entails the ideal that participants are providing a necessary service for the community who without the students help would be incapable of providing for themselves (Wade, 1997; Wade, 2000). Rather than supporting and uplifting the community, this type of engagement can actually increase feelings of dependence and inferiority within community members, and reinforce false ideologies in students that are belittling or even racist towards the community (Cruz, 1990; King, 2004; Wade, 1997).

Along this line it is necessary to point out that the mere capacity for an individual to serve another indicates that the server is in a privileged state compared to the recipient (Alcoff, 1995). Even when students are living within the community they are serving, everyone knows that they have the ability to remove themselves from the situation whenever they want, an option that is very often not present for the local members of these communities. True service learning is considered to be the participation in a mutually beneficial partnership. However, the privilege associated with the power to take up an issue or walk away from it at a whim may prevent notions of mutuality “in terms of vulnerability, investment, or consequence (King, 2004, pg. 123).” This power gap presents a critical barrier to effective service learning if it is to promote equity and equality.

However, service learning pedagogies can use methods to reduce this notion and

more accurately portray a sense of mutuality to students (Boyle-Baise, & Sleeter, 2000; King, 2004). In order for this to happen though, several conditions must be met. First, in order for the service venture to not appear exploitive and selfish, it must address real community needs identified by the community (Boyle-Baise, & Sleeter, 2000). To successfully achieve this, local communities need to be considered as partners from the initial planning and throughout the execution of the program (King, 2004; Rosenberger, 2000, Peterson, 2009).

Second, in order to prevent students from thinking of the service as directional rather than mutual, the benefits of service to the students should be highlighted (King, 2004). While the benefits of the service to the community are typically obvious, the benefits that the students receive are often less so. It should be made readily apparent to the students that they are learning from the community, diversifying their own perspectives, and developing positive relationships (King, 2004). If directed appropriately, the reflection and dialogue tools discussed in the previous section can be very useful to help students recognize these benefits (Boyle-Baise & Sleeter, 2000; Eyer, 2001; King, 2004; Krans & Rourke 1994; Peterson, 2009).

As mentioned at the end of the last section, humans can often be very reluctant to challenge their world-view assumptions. Boyle-Baise and Sleeter (2000) found that when students have the opportunity to confirm or disconfirm preconceived assumptions through reflection or journaling, that participants more typically identify with experiences that reconfirm their previous notions, rather than adopting new ones. So, unless explicitly instructed to do so, students will interpret service experiences in a way that acts to

solidify their perceived reality rather than confronting those beliefs with the possibility of experiencing an epistemological rupture or break with their current world view (Darley & Gross, 1983).

Freire and Macedo (1995) distinguish between thinking about past experiences and theorizing about them. When students theorize about problematic questions associated with notions of superiority and history, and critically inquire about the methods that appear to make their lives better students can find themselves in a position where they can no longer justify previously held beliefs (Freire & Macedo, 1995; Brookfield, 1995; Brunner, 1995). King (2004) describes this process as defamiliarization.

When this happens King (2004) found that:

What was once strange becomes familiar, and what was familiar is made strange again. In this experience, one that operates largely beyond our control, doubt and hesitancy are introduced into situations with which we are comfortable and secure, while those previously considered alien or incomprehensible are rendered more readily recognizable (P. 125).

Individuals can become forced to distance themselves from beliefs that were once held close, but a challenge still exists to turn this deconstruction into positive long-term growth. One way to direct this ideological reconstruction is by fostering a relationship between the participants and the object that the program is trying to promote. If the object is environmental concern, then fostering a relationship with

the environment may help focus this value reorientation. The following section includes a comprehensive overview of the literature on the effects of developing and lacking connections with nature.

Emotional affinity with Nature

The term *biophilia* was first introduced in E. O. Wilson's 1984 book of the same name. In *Biophilia*, Wilson proposes that humans are evolutionarily designed with an innate predisposition to love and value living things (Wilson, 1984). Defined as the "love of life or living systems," *bio (philia)* represents the opposite of the phobia concept, or fear/repulsion of something (Wilson, 1984). Instead of producing aversions, these deep connections with the natural world act to ground us in our existence and compose a large portion of culture (Wilson, 1993). Many researchers have found evidence to support these connections; most Americans seek out relationships with living things, and value those things even when not exposed to frequent contact with them (Gullone, 2000; Kals, Schumacher, & Montada, 1999; Kellert, 1997; Simaika & Samways, 2009).

If humans have these types of innate desires to build relationships with the natural world, then fostering those relationships should be a critical component of environmental pedagogies. Building these connections is of increasing concern, because many Americans no longer have access to these relationships.

Basking (1997) found that:

Today only 3 percent of the global land surface is set aside in parks and

protected areas. More than 95 percent is already under direct human influence, whether plowed, paved, and managed intensively, or sparsely occupied by rural or indigenous peoples. (p. 224).

If humans do not have the capacity to develop these bonds then they will perpetually lack some aspects of their psychological health (Gullone, 2000, Ulrich, 1993). Humans have in fact gone to great lengths to maintain some sense of this relationship. In the United States alone there are 95 million pet cats and dogs, and more people visit zoos every year than attend all major sporting events combined (Newby, 1999; Shepard, 1993; Wilson, 1992). However, even these types of relations represent a mere shadow of our historical relations with nature.

Wilson (1993) argues that because over 99% of the brain's evolution occurred in a biocentric world, we cannot replace those needs with built environments in a matter of two or three generations. Instead, when we become separated from natural environments, these biophilic cognitive needs “persist from generation to generation, atrophied and fitfully manifested in the artificial new environments which technology has catapulted humanity (Wilson, 1993; p. 32).”

Across cultures, there are consistent findings that humans prefer natural scenes to urban ones (Kaplan, Kaplan, & Wendt, 1972). Further, ratings of natural scenes are significantly decreased when artificial elements are introduced (Ulrich, 1993). Also, many studies have found that time spent in natural environments or visual exposure to nature produces a significant decrease in stress, and improves healing (Kaplan & Kaplan, 1989; Parsons et al, 1998; Sheets and Manzer, 1991; Ulrich, 1981).

There is also evidence that this affinity to nature and more cognitive interests in the environment are instantiated through actual experiences in nature (Lyons & Breakwell, 1994; Kals, Schumacher, & Montada, 1999). Activities such as observing animals, weather phenomenon, and changing seasons have been observed to increase *biophilia* (Lyons & Breakwell, 1994). Immersion experiences and stays in nature have been shown to be especially effective at increasing emotional links, and sparking cognitive interests (MaaBen, 1993a).

Finger (1994) found that these stays in and experiences with nature are more valid predictors of environmental behaviors than holding pro environmental values. As with service learning, the affinity individuals develop with natural environments during these experiences is mediated by the presence of others (Kals, Schumacher, & Montada, 1999). Kals, Schumacher, and Montada (1999) found that being able to communicate about emotions provides security and prevents negative associations with the experience, and plays a role in developing an emotional connection with nature. How concrete ones experience with nature is plays a large role in developing emotional affinity with nature (Gopfert, 1987; MaaBen, 1993a, 1993b; Seel, Sichler, & Fisherlehner, 1993). Groups and close friends help to do this by sparking curiosity and interest through questions and expressing their own amazement or observations (Kals, Schumacher, & Montada, 1999).

The tendency that humans have to develop an affinity with nature combined with the fact that we often lack such a connection brings up two questions related to this topic. First, what psychologically detrimental effects could be associated with the now common occurrence of lacking connections to nature? And second, can fostering an emotional

connection with natural environments help to promote better psychological health and develop a sense of personal obligation to protect natural environments? For a review of content regarding the first question, see Gullone (2000). The following sections in this thesis will attempt to address the content of the second question, and hopes to illustrate that in combination with the other concepts addressed here in that developing ones sense of *biophilia* plays an important role in promoting conservation efforts around the globe.

Mutually Positive, Weak Social Relationships

Over the last few decades' psychological researchers have begun looking into the types of relationships that individuals form with one another, who relationships tend to form between, and what impacts different types of relationships have on one another. One very consistent finding has been that humans tend to create strong relationships with people who are very similar to them (Kossinets & Watts, 2009; McPherson, Smith-Lovin, & Cook, 2001). This homophily principle is apparent in all aspects of social relations; people tend to marry, be-friend, ask advice from, talk, work, etc. with others who share very similar personality, racial, and economic traits as themselves (Kossinets & Watts, 2009; McPherson, Smith-Lovin, & Cook, 2001). These self-imposed restrictions have "powerful implications for the information they receive, the attitudes they form, and the interactions they experience" (McPherson, Smith-Lovin, & Cook, 2001; abstract).

If the ideas, beliefs, experiences, news, etc. that someone receives is very similar to or the same as what they are receiving from most other sources then the attitudes and beliefs that form based on that information will be very skewed and biased (McPherson,

Smith-Lovin, & Cook, 2001). Further, because that information is coming from sources that already believe similarly to the recipient, it will act to support and reinforce current notions rather than challenge previous assumptions (Kossinets & Watts, 2009; McPherson, Smith-Lovin, & Cook, 2001). Finally, Kossinets and Watts (2009) found that due to structural determinants, the principles of homophily tend to build over time as similar individuals tend to localize around one another, further limiting their access to diverse trends of thought in a compounding way. In other words homophily leads to further homophily, and communities tends to become more homogenous as time passes. In light of these findings, homophily presents a particular challenge to promoting positive social change because the introduction of new ideas may fall on deaf ears when few sources of information challenge current assumptions while the majority reinforces current behaviors and attitudes.

Granovetter (1973) examined the strength of interpersonal ties in order to measure the impact of different connections on individual beliefs, attitudes, and behaviors. Strength of tie here refers to the amount of time, emotional intensity, mutuality, and services performed for one another. Granovetter (1973) found that weak ties as opposed to strong ties were more effective at introducing new information to individuals. Further, these weak ties act to challenge pre-conceived notions because the individuals are more dissimilar than they are from their strong ties. In terms of networks, strong ties (close friends) tend to form clusters or interconnected groups that are very dense and cohesive (Granovetter, 1973). However, these strongly linked groups also have a few connections to other tightly knit groups. The connections that serve to link two groups that would

otherwise be unconnected are powerful because they provide disconnected networks with bridges to increase the flow of information between individuals with diverse dispositions (Burt, 2004; Granovetter, 1973; Granovetter, 1983; Granovetter, 2003; Putnam, 2000).

Some individuals have more weak ties than others, and serve to connect many different groups that would otherwise be unconnected. Burt (2004) describes the space between these groups as structural holes. When two or more individuals create a link between two groups that were previously unconnected they fill the structural hole. Because of the effect of homophily on social networks, individuals that act to fill structural holes have greater access to and typically are more familiar with diverse ways of thinking and behaving (Burt, 2004). Burt (2004) analyzed thousands of relationships within business organizations in order to identify structural holes. The findings of this study indicate that individuals that fill structural holes are more creative, have better ideas, and are more respected by their peers than those who do not. The author concludes that having access to diverse ways of thinking provides those individuals with a more holistic perspective that allows them to approach situations dynamically in order to settle conflicts and produce effective solutions in more scenarios (Burt, 2004).

In order to relate these findings to service learning, it is important to note that the content discussed in the above section *Deconstructing Notions of Cultural Superiority, Reconstructing beliefs in the Unfamiliar*. Here the author presented an overview of research that illustrates the difficulties with promoting mutuality within a service learning context, and presented solutions to motivate students to approach those being served as equals and with humility rather than with an air of superiority or condescendence. If

students do not approach service learning in this way, then they will probably not develop mutual friendships or be impacted in a significant way by the community.

However, students that engage in meaningful relationships with communities on international experiences can become bridges between very diverse and largely unconnected social networks. Indeed, many researchers have found that building these types of relationships with culturally distant communities is a critical aspect of any successful service experience (Boyle-Baise & Sleeter, 2000; Dutton & Heaphy, 2003; King, 2004; Maher, 2003). Boyle-Baise and Sleeter (2000) found that those participating in service learned the most when the community promoted interaction with youth, adults and families. In addition, participants challenged their own previous assumptions more when they were placed among groups that were from different cultural groups than their own.

In regards to the concept of social homophily, most Americans are also exposed to a limited scope of biospheres, which are typically dominated by urban settings (Baskin, 1997). This homogeneity in terms of environmental settings is similar to human experience with cultures; people tend to associate with what is familiar and lack appreciation for diversity because of it (Lyons & Breakwell, 1994; Kals, Schumacher, & Montada, 1999; McPherson, Smith-Lovin, & Cook, 2001). Because of this, the author believes it is appropriate to consider the disconnection between human experience and natural settings as another type of structural hole. By providing a real life example of potential biodiversity, participants can begin to challenge their own assumptions about natural environments and their importance (Lyons & Breakwell, 1994; Kapan & Kaplan, 1989;

Parsons et al; Sheets and Manzer, 1991; Ulrich, 1981). It is plausible that this experience occurs in a similar way to how individuals challenge cultural beliefs when confronted with diverse groups of people. Because of this, programs that immerse participants in natural settings may further benefit from providing a contextual relationship for participants to develop an emotional connection with nature and challenge their previous assumptions about it.

To summarize, positive human development is fostered through mutual relationships that are both empathetic and empowering for all parties involved (Boyle-Baise & Sleeter, 2000; Dutton & Heaphy, 2003; King, 2004; Maher, & 2003; Miller & Stiver, 1997). When these connections are formed between groups that hold disparate beliefs, attitudes, and/or are from different cultures, participants are exposed to new ideas that can effectively challenge preconceived notions regarding social and environmental issues (Boyle-Baise & Sleeter, 2000; Burt, 2004; King, 2004; Maher, 2003). Finally, the number of diverse connections an individual makes, and the length of time that they are exposed to diverse and/or weak ties should effect how robust and significant the changes are within individuals (Burt, 2004; Boyle-Baise & Sleeter, 2000; Granovetter, 1973). As put by Peterson (2009), “In nurturing our diverse communities, we aim to move beyond the confines of the academy of insular organizational interests as we imagine a new world into being and actively collaborate in its creation.” (pg. 551).

A Value, Belief, Norm Theory

For more than 20 years Paul Stern et al. have been researching personal

characteristics that predict environmental behaviors (Gardner & Stern, 2002; Stern, 2000; Stern & Dietz, 1994; Stern, Dietz, Abel, Guagnano, & Kalof, 1999; Stern, Dietz, & Kalof, 1993; Stern & Oskamp, 1987). The results of this body of research have led to the development of a framework for why individuals may or may not support the environmental movement. To date this theory of environmentally significant behavior provides the most predictive account of environmental support (Stern, 2000; Stern, Dietz, Abel, Guagnano, & Kalof, 1999).

This theory builds off of previous research on social movement support, which laid the theoretical foundations for why individuals join social movements. Promoting social change runs into many difficulties; as described in above section *Thesis Goals, Research Hypothesis* there are many barriers to social change. These include cultural barriers, such as social norms, which tend to re-enforce the status quo (Gardner & Stern, 2002; Stern et al. 1999). In addition they include structural barriers, which may prevent individuals from acting on intentions or beliefs (Gardner & Stern, 2002; Stern & Oskamp, 1987). If an individual wants to give up driving on a daily basis, they may be prevented from acting on this belief if they live in an area that prevents them from doing their job without an automobile.

Due to these limitations, large scale activist support for environmental movements will often times be limited until widespread non activist support for those movements develops as well (Johnston, Enrique, & Gusfield, 1994; Stern et al. 1999). In order to encourage the development of this support Stern et al. (1999) proposes that movement success is dependent on its capacity to reconstruct personal norms to produce feelings of

obligation in support of a movement based on altruistic principles rather than self gain. Personal norms are based on several factors, yet one of the most significant is value orientation (Gardner & Stern, 2002; Snow, Rochford, Worden, & Benford, 1986; Stern et al. 1999).

Based on these general principles, Stern et al. (1999) developed the *Value, Belief, Norm* theory, which proposes that personal norm based behaviors stem from three variables. The first half of the theory focuses on shifting personal norms. The authors postulate that the first step to this change happens when individuals reprioritize values that are congruent with a movement's main goals. If those individuals also believe that the object of value is endangered or threatened, they should develop a personal norm to protect that object. The second half of this theory addresses the process of turning this norm into activist support. If an individual believes that their actions have the power to improve the condition of the valued object, then the most activist type of support will occur. In other words, one's self-efficacy in regards to a problem plays a large role in turning personal obligations into real actions. Without this belief behaviors will probably be limited to movement support rather than political/social activism.

Non-activist support can include conservation behaviors such as recycling, walking or taking public transportation etc. These are benefits in and of themselves, but this type of support is also important because the environmental movement as a whole is dependent upon a widespread shift in value orientation (Gardner & Stern, 2002; Stern, 2000; Stern et al. 1999). Whether or not structural and efficacy barriers can be addressed may limit behavioral changes. However, promoting widespread personal obligations for

environmental protection is the first step in overcoming such ingrained cultural barriers (Stern, 2000; Stern et al. 1999). Any program that seeks to promote such an orientation change should account for these factors when attempting to design and implement an effective pedagogy.

Combining the Approaches: RICA as a Set of Holistic Service Learning Experiences

Rainforest Immersion and Conservation Action is an international study abroad experience. As a program its goals are largely comprised by: Seeking to minimize harmful impacts on the natural environment; building positive social ties with local communities through mutual service; challenging cultural assumptions about environmental and social issues; developing emotional connections with nature; and increasing self efficacy in regards to environmental problems. To date efficient strategies for promoting altruistic norm activation are lacking. Because of this, the RICA program has been developed in the hopes of becoming an effective pedagogy to promote the reconstruction of *VBN* in support of environmental and altruistic values. This thesis posits that the combination of techniques described above, in particular the development of mutually positive connections, can serve as a catalyst for many individuals in the reconstruction of personal norms, values, and beliefs.

The purpose of this research was to examine an eclectic immersion experience as a tool for promoting changes in *VBN* in comparison to a WWU Environmental Studies Course that incorporates service learning into its framework. In order to develop an understanding of personal norm activation, it was necessary to examine a large body of

research from several different fields, including: Environmental Studies, Social Networking Science, Sociology, and Psychology. The concepts illustrated by network researchers as described in the above section: *Mutually Positive*, *Weak Social Relationships* demonstrate that diversity is an important aspect of successful designs. In good faith with this concept, this thesis attempts to bridge gaps between several disciplines that have much to offer one another. The next chapter includes a thorough description of the methodologies employed in the implementation and examination of the current study.

Chapter 3- Methods

The following chapter provides a thorough description of the methodologies employed during this thesis. First, is a description of the participants who were a part of this study. It is followed by an overview of the separate measurements being examined as a part of this thesis. This includes three separate measures: a pre-post survey analysis; a pre-post examination of student journals; and a social networking measure that will be more thoroughly described below. Finally, the chapter concludes with an account of the procedures used in implementing this thesis.

This thesis takes the form of a mixed methods approach. The quantitative portion of this analysis is largely based on Stern et al.'s (1999) questionnaire used to measure environmental values and norms. This approach was shown to have more predictive validity for behaviors than previous measures. The journal analysis portion of this research was largely based on Maher's (2003) work on immersion experiences and the reflection process. Based on this research operational definitions were produced to parse three separate variables from journal content. Finally, the network approach is conceptually based on Granovetter (2003) who illustrated the importance of weak ties for personal growth. The methodological approach taken here was largely based on the work of several social network analysis researchers (Kirke, 2007; Knoke & Yang, 2008; Scott, 1991).

Participants

Participants were 47 (19 male, 28 female) Western Washington University Students who were either students enrolled in the RICA program or Environmental Studies Majors enrolled in ESTU 436. Participation was voluntary; students were requested to partake by the course professor. The RICA group is comprised of 16 (4 male, 12 female) students (Mean birth year= 1986.21) from the 2009 program and 17 (6 male, 11 female) students (Mean birth year= 1988.88) from the 2010 program. The control group for this thesis was selected based on the similarities it shared with the RICA program. The control group consisted of 14 (9 male, 5 female) students (Mean birth year= 1987.85) who were Environmental Studies majors completing a graduation requirement through Huxley College at Western Washington University.

The same instructor taught both the RICA program and ESTU 436. The students in both courses were largely comprised of Environmental Studies students who at pretest expressed similar levels of support for the environmental movement (Control mean= 3.42, RICA mean = 3.48). In addition a major component for both programs was to incorporate service-learning elements into the course goals. The main difference between the two groups was the immersion experience, which includes the development of not only new connections, but also diverse ones that previously would have been inconceivable for students.

Procedure Experimental Group

This study took advantage of both qualitative and quantitative approaches. Between surveys, journal content analysis, and social graphs the researchers sought to provide a comprehensive overview of the course. In this way the author wanted to find which aspects of the learning environment contribute to identity reconstruction in order to build upon current research on environmental pedagogies.

The quantitative portion of this study began before students actually arrived in Costa Rica. After the registration for the RICA program had closed, participants joined in on several meetings with one another and the course instructor to prepare for the trip. As the departure date drew near, the instructor asked participants to fill out a 59 item pre-trip survey. The items on the survey included constructs measuring: self worth, altruistic and family values, sense of responsibility and emotional affinity with nature, severity of environmental problems, current environmental support, and demographics. This served as a fairly comprehensive survey assessment of student's beliefs on social and environmental values.

When students arrived in San Jose, Costa Rica, a complimentary shuttle service brought them to the hotel where Dr. Troy Abel, the program instructor was waiting. Once all of the students arrived basic course requirements and the agenda for the next few days were discussed. Following this, participant's first assignment for the course was to complete their first journal assignment. Minus a few exceptions, students were required to respond to journal prompts on every day of the program. The last journal question for the course replicated the question asked on the first day. This allowed for the two

questions to act as a basis for a more open ended pre-post assessment. In this way the researchers hoped to see how student's responses to a single set of questions would change during the course. The first assignment asks students to: "Describe your values and beliefs about tropical biodiversity and conservation. What is the role of tropical biodiversity? What is happening to tropical biodiversity? Who is acting to conserve tropical biodiversity? Who should do more to conserve tropical biodiversity?"

The next morning participants were shipped off to Monteverde (Green Mountain) in the northern central highlands of Costa Rica. Here students had their first biological immersion and had their first group discussion on environmental privileges and the distinctions between private reserves and public ones. After two days in the cloud forest the program headed south to Carara National Park on the southern edge of the *Gulfo de Nicoya*. Here students would spend the next week beginning their research projects, volunteering for the park, and beginning to make connections with locals. Students also participated on some eco tourist activities such as a guided crocodile boat tour, and a tranopy (combination canopy gondola and zip line) ride. In addition to Dr. Troy Abel, students were introduced to some of their local instructors that joined the program off and on for the rest of the trip. These individuals acted as naturalist guides in the jungle, Spanish tutors, and interpreters/intermediaries for the local populace.

During student's time in the central pacific, they also had the opportunity to stay in an eco-lodge inside the village of El Sur. Here students got to see how Costa Ricans used to live, and what a sustainable community looked like. The education team was also able to perform the first portion of their research project here, and engaged students in a

participatory environmental education program that lasted for about two hours. In addition students got to witness first hand the process involved with operating a sustainable sugar cane farm, and were able to participate in the process of creating natural cane sugar.

After their time here, students returned to San Jose in order to visit the University for Peace. Here students spent two days attending lectures from University for Peace Professors on topics regarding environmental justice, sustainability, and environmental peacemaking. Students participated in discussion and journal reflection afterwards and were required to examine and critique the ideas brought up during the lectures.

After the University for Peace participants were given a three-day break to enjoy the Central Pacific and relax before heading south to Guadalupe on the Osa Peninsula, near Corcovado National Park. Here students stayed at an eco-lodge built and maintained by the local community, joined in on nature hikes, and the education team performed their second environmental education program with local children.

After two nights in Guadalupe the students headed into Corcovado National Park, which started at 4:00 am with a three hour tractor ride into the park and ending with a seventeen mile trek to reach the Pacific coast and Sirena Station in the heart of the park. Here students spent 10 days researching, writing, and performing service work for the park. National Geographic has described Corcovado National Park as “the most biologically intense places on earth” (Kutznetsov, 2010). This provided a unique opportunity for students to immerse themselves in the biology of Costa Rica, and compare the experience to other reserves and parks that they had witnessed during their

time in Costa Rica.

After their time in Corcovado, students were given another two-day break on the coast before heading back to the University for Peace to present their research projects. At the University for Peace students listened to two additional lectures and discussed their own projects and findings. On the last day of the trip students handed in their journals and celebrated their time and experiences together before splitting up and heading home.

Procedure Control Group

The control group used in this study was comprised of students enrolled in Environmental Studies 436, *Environmental Impact Assessment* at WWU. ESTU 436 has several main goals for the course. It seeks to prepare students to effectively develop environmental impact assessments, which include weighing costs and benefits between complex choices, and thinking outside the box to examine alternatives to existing or potential policies/decisions (Abel, 2010). As part of the course requirements, students form groups in order to work on the creation of a real development proposal. In this way it is intended to remove students from a traditional lecture based course framework, and engage them in research on real issues that requires the integration of skills developed during students time at WWU (Abel, 2010).

The service learning project for the course required students to collaborate with two local organizations: the City of Bellingham's Office of Planning and Community Development; and Sustainable Connections, which is a local nonprofit. Student's research

responsibilities were to build on the work of previous students and organization members in order to promote Smart Growth planning and Green Development. This allowed students to be involved in creating a more sustainable and urban community within Bellingham. Students were encouraged to approach this project from a service learning perspective, and emphasis was put on the benefits students receive from the work they did, as well as the community benefits that could result from their projects. In addition students were required to present their work and findings at a public hearing at the end of the course.

Variables Under Investigation

The independent variable under investigation in this thesis was the program or course that students participated in. In order to measure the changes due to these programs, several dependent variables were used. The first group of dependent variables (DV) took the form of a quantitative analysis. For this set of DVs all participants completed a pre-post survey examination, which was based on Stern et al. (1999) and measured traits including: egoism, ethnocentrism, environmental values, personal responsibility for environmental problems, current environmental behaviors, family values, and self-efficacy. The second DV included both quantitative and qualitative comparisons. It consisted of student's journal content from the RICA program. The qualitative portion of the analysis was based on Maher (2003) and includes participant reactions to the course, and examples of their own thought process in the re-evaluation of previously held beliefs and values. The quantitative section of this analysis

was built upon a pre-post reflective journal question. Three constructs were identified and operationally defined for examination. After the program journal content in response to the pre-post questions were analyzed for changes in expressed values. The final DV primarily focused on qualitative examinations. This portion of the analysis was based on the work of social network researchers and focused on the connections developed between the participants in the study and others through the service learning components of the two programs (Kirke, 2007; Knoke & Yang, 2008; Scott, 1991). The resulting information was represented in the form of a social graph, which depicts criterion dependent connections between individuals. This portion of the analysis was intended to qualitatively measure the differences in interactions between the two groups.

Pre-Post Survey Examination

As mentioned above in the previous section, a pre-post survey analysis was used as a quantitative measure of value change in both the experimental and control conditions. This survey was adopted from Stern et al. (1999) due to the relatively high predictive validity it has displayed in past studies. All information was collected anonymously and no personal information was retained. The 59-item survey was administered to the experimental group prior to departure on the RICA program. The complete survey administered can be found in Appendix A. 30 Students completed the pre trip survey. At the end of the program the course instructor asked students to participate in a post survey as well. They were sent an email with a link to the post survey in order to participate at their leisure. 24 students completed the post survey, which gave

an 80% completion rate for the experimental group.

The control group was administered a very similar survey on the first day of the course. One component of the original survey was to measure participant's perception of the seriousness of toxic waste problems and to determine whom they perceive as responsible for the prevention of toxic waste. The class used as a control group for this study did not directly address toxic waste problems in the course. Because of this, the four questions in the experimental study addressing these issues were modified to represent growth management issues instead, which was a topic discussed in the control group course. 14 students participated in the survey assessment at the beginning of the course. At the end of the course, the professor handed out an identical survey and asked participants to fill it out once more. 12 students completed the post survey, which was an 86% completion rate.

Pre-Post Journal Assessment

As mentioned above, students completed journal entries nearly every day of the program. However, until 2010 the RICA journals did not include two parallel questions as a basis for comparison. Because of this, no pre-post assessment on journal content was performed on the RICA 2009 participants. In addition, the control group did not participate in a pre-post journal activity either. For the quantitative analysis on journal content, only the 2010 RICA group was included. 17 students completed both journal questions used for the quantitative portion of this analysis.

The first and last prompts in the students journals were nearly identical questions which asked the students to discuss their values and beliefs about tropical biodiversity, tropical biodiversity's role in the environment, what is happening to it, who is acting to conserve biodiversity, and who should be doing more. The final question was the same except that it added how has Costa Rica changed your beliefs? Also it asks students to describe what they gained from the program that they could not have gained from a campus-based course. These questions were designed to assess the student's sense of responsibility, their understanding of biodiversity and its importance, and their knowledge of current environmental activists/organizations that were working to conserve tropical biodiversity.

These questions were asked of students on the first day, and on the last day of the program five weeks later. Using this pre-post methodology the authors hoped to gain a less restricted understanding of participants value change throughout the program. The journals allowed the authors to look for evidence of increased personal responsibility to act in pro-environmental ways, emotional connections to the environmental movement, and self-efficacy towards environmental problems. Journal entries are more open ended than questionnaires, which limits the ability of the participants to predict desirable answers and respond in congruency to those predictions. In this way the authors hoped to look for more subtle changes in attitudes that may not have been apparent in survey results.

The previously mentioned constructs being measured within the journals were operationally defined and scored independently to assure inter-rater reliability. In order

to preserve participants confidentiality, all names were disassociated from the journals. Points were awarded to each category for every time the participant fulfilled the operationally defined requirements of each construct. Journal content was also used as part of the qualitative analysis for this study. In this regard, quotes from student reactions to various portions of the program were drawn to illustrate the impact of the program that many students self reported.

Social Network Analysis

The final variable under investigation as part of this thesis, took place in the form of an analysis of the social connections developed during both the control and experimental groups. The methodologies used for this DV were based on the approaches illustrated in both Knoke and Yang (2007) and Kirke (2008). Data from the 2009 RICA program was not available for this portion of the study. Because of this, only the RICA 2010 experimental group will be included in this analysis. This portion of the investigation was observational; because of this all 17 participants from the RICA 2010 group participated in this portion of the study as well as all 19 students from the control group.

Since a main component for both the control and experimental groups included elements of service learning, this was used as the basis for determining social connections. In other words, whether or not participants served another individual was used to determine if this type of connection was made between two people. For purposes

of this portion of the analysis, a service relationship was operationally defined as a relationship that: was integrated into the academic curriculum of the students, was mutually beneficial to both parties involved, and was instantiated at least in part due to a desire from either party to promote the well being of the other.

Based on this operational definition a social matrix and graph was constructed for both groups and compared. The purpose of this portion of the analysis was to examine the differences between the construction of networks in an immersion experience compared to a more typical learning environment. The qualitative portion of the analysis should help illustrate the effects found in other portions of the current examination.

The above description of the methodology used in this study was necessary to provide an understanding of the experiment at hand. In addition, it provides a conceptual framework for the construction of two different educational pedagogies. Components of both have been shown in the past to result in positive value change. The following section will describe the results that the current study found in regards to the two different programs.

Chapter 4- Results

In the following chapter the author will provide a thorough description of the results for each variable under investigation. First, the results from the survey assessment will follow. Second, the results from the quantitative portion of the journal analysis will be described. Finally, the findings from the social network analysis will be presented.

Pre-Post Survey Results

An independent sample t-test found that participants in the experimental condition identified more with values of: social justice and caring for the weak; preventing pollution and conserving natural resources; a willingness to forgive and pardon others; and having influence and impacting people and events (see Table 1). The changes achieved statistical significance. Participants marginally identified more with values of: equality, equal opportunities for all; living in a world of peace, free of war and conflict; respecting the earth and living in harmony with nature; having a sense of belonging and feeling that others care about me; and family security and safety for loved ones, see Table 1. Participants in the experimental condition also marginally expressed an increase in their beliefs that: business and industry should reduce their emissions to help prevent climate change; and that climate change would be a serious problem for the United States, see Table 1. Participants also expressed a marginal decrease in their identification with one value. Compared to pre-RICA survey results participants marginally decreased their expressed values of social power, dominance and control over others, see Table 1.

It is interesting to note that participant's values did not significantly change in some expected areas. Students did not significantly vary in their expressed beliefs that: companies that import products from the tropics have a responsibility to prevent destruction of the forests in those countries; the government should take strong action to reduce emission and prevent global climate change; I have a personal obligation to prevent climate change; and that people like me should do whatever we can to prevent the loss of tropical forests, see Table 1.

For the control condition, an independent samples t-test found that participants in the control condition did not significantly increase their identification with any of the 59 survey items (see Table 2). Eight items achieved a p value of less than .20 (see Table 2). Although participants in the control condition did significantly increase their association with any of the survey items, students did decrease their expressed identification with the values of obedience, being dutiful, and meeting obligations (see Table 2). This change achieved statistical significance. In addition, participants significantly reduced their perception of having signed a petition in support of the environment (see Table 2).

Of the 59 survey items, 48 items measure environmental and altruistic values, four items measure egoistic values, and seven items are neutral in regards to environmental/egoistic values. Although non-significant, the direction of the change in values was surprising. Overall, nine of the 48 items associated with altruistic and environmental values displayed a mean increase while the other 30 items associated with altruistic and environmental values showed a mean decrease. Two of the four items

associated with egoistic values displayed a mean increase and the other two items associated with egoistic values resulted in a mean decrease. Next will follow a description of the results from the journal analysis.

Journal Analysis Results

For the quantitative portion of this measure, four constructs were operationally defined. An independent samples t-test found that participant's journal entries included significantly more statements regarding personal responsibility and self-efficacy towards environmental issues in the post journal entry compared to the first journal entry, see Table 3. An independent samples t-test also found that participants marginally increased statements regarding the constructs of social responsibility towards environmental problems, and on emotional connections with the environmental movement, see Table 3.

Based on the quantitative analysis above, participants displayed a marginal to significant increase on all four coded variables within the journals. A qualitative analysis of those results will follow. Out of seventeen total journals, 7 statements were made ($M = .41$) in the first entries that were classified as social responsibility. Provided is an example of social responsibility from one of the journal responses to the first question: "I think everyone should do more to conserve tropical biodiversity." In the final entries 12 comments were made ($M = .71$) that were classified as social responsibility. Of those twelve, five explicitly identified the self as personally responsible ($M = .29$). An example of personal responsibility from one of the final journal entries is provided: "I am inspired to work to preserve tropical biodiversity and to tell anyone who cares about it... what we

can do to make sure it is always here.” Overall, social responsibility comments increased 30% and personal responsibility comments increased 29% between pre and post journals.

In the pre journal entries two comments were made ($M = .12$) indicating emotional connections to the environmental movement. In the post journal entries six comments were made ($M = .33$) indicating emotional connections to the environmental movement. An example is provided: “I now think that tropical biodiversity is the most important thing to preserve when it comes to forest preservation.” Overall, emotional connection comments increased 24% compared to pre tests.

In the pre journal entries zero comments were made by participants indicating self-efficacy to deal with environmental problems. In the last journal entries 4 statements were made indicating self-efficacy ($M = .24$). An example is provided from one participant’s pre journal entry and post journal entry regarding self-efficacy. Pre- Student A: “Until the majority of people make conservation a priority then the actions of a few will fail to create significant change.” Post- Student A: “We have to believe that everything makes a difference, because it does.” This example is an illustration of how one student changed their perception of their own capacity to make a significant change in regards to environmental problems. Overall, self-efficacy comments increased 24% between pre and post. Following are more examples that describe this shift.

In response to the first question, student B wrote: “All tourists who come to places like this... should make small donations through customs or something.” In response to the last question student B wrote: “Everyone needs to be up in arms about

what is happening to tropical biodiversity and trying to find ways to stop it.” Student C, in response to the first question described that: “Many scholars and scientists are researching... biodiversity... in order to protect it... but I think more people should do more.” In response to the last question student C wrote: “It is extremely important and crucial that we do what we can to preserve rainforests. Tropical biodiversity... provides many ecosystem services... to the world.”

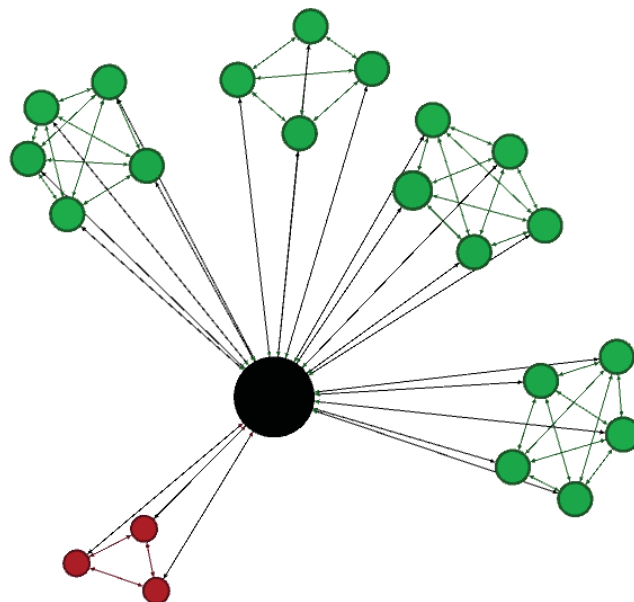
In addition to these examples, participants also expressed an increase awareness of the consequences of their actions. In the post journal entry, one student stated, “I feel like many people do not realize how much choices they make effect people and places thousands of miles away.” Another student wrote, “Conserving these forests/ natural beauties like this are more important than can be stressed by these words.” Still another student said, “I am so much more aware of how my actions affect the environment, and will certainly carry what I’ve learned home with me.” The above qualitative description of the journal results was included to provide context and examples to better illustrate the quantitative results of this measure.

The above results illustrate that RICA group developed new beliefs and changed their attitudes towards the environment and social issues. In contrast, the survey results indicate that the control group did not. Based on Granovetter (1973, 2003) weak social ties should play a role in the development of new ideas and beliefs. The following section will measure if the development of weak ties was correlated with the differences seen above.

Social Network Analysis Results

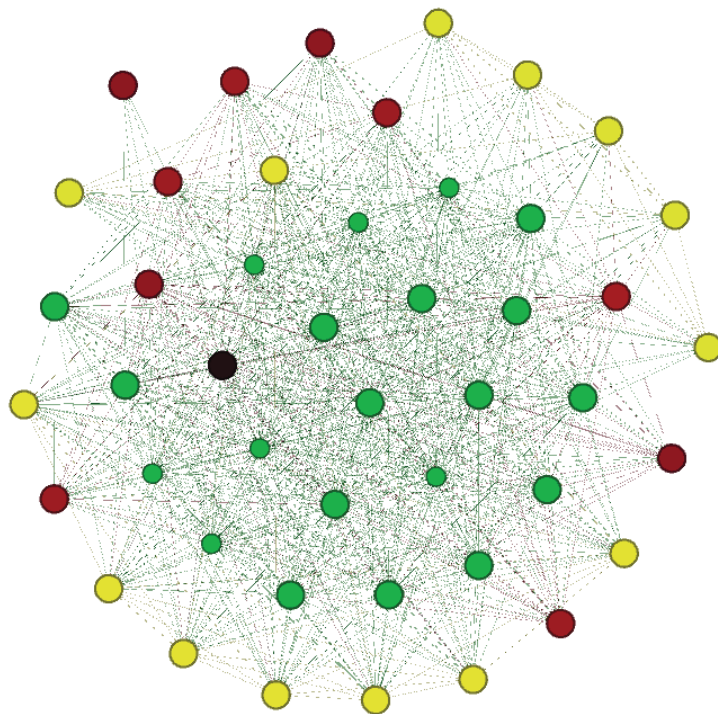
The results from the social network construction analysis displayed two different graphs based on the connections developed throughout both the RICA program and the control course. Using the operational definition described in the methods section, connections were assigned to each node based on the listed criterion. The RICA network included 48 nodes and 1052 total connections or edges. The control network included 23 nodes and 122 total edges. The Social graph for the control group can be seen below in Figure 2. The social graph for the RICA group can be seen below the control graph in Figure 3.

Figure 2. Control Group Service Social Graph



Note- Green nodes represent student participants. Red nodes represent sustainable connections and Bellingham Planning Department. The Black node represents the course instructor.

Figure 3. RICA Service Social Graph



Note- Green nodes represent RICA members. Red nodes represent adult service contacts. Yellow nodes represent child service contacts. The black node represents the course instructor.

The social graphs were analyzed using AGNA (Applied Graph and Network Analysis). As stated above, the control group had a total of 23 nodes and 122 directed edges or connections. A network with a density of one indicates that every node in the network is connected to every other node in the network (Kirke, 2007; Knoke & Yang, 2008). AGNA found that the control group had a density of .24. Betweenness centrality is a measure of the individual nodes within a network that serve to connect other nodes that would be unconnected without the intermediary (Kirke, 2007; Knoke & Yang, 2008). Within the control group, only one node had a betweenness centrality score. The course instructor had a betweenness centrality of 384.00. However, no other nodes served to connect other nodes as intermediaries. This makes the structure of the network totally dependent upon the single node. Indegree centrality is a proportional measure of the number of incoming links upon a node compared to the number of nodes in the network (Kirke, 2007; Knoke & Yang, 2008). The mean indegree for the control group was .24 while the course instructor had an indegree of 1.00. Outdegree centrality is a similar measure to indegree except that it measures the number of outgoing connections from a single node (Kirke, 2007; Knoke & Yang, 2008). The mean outdegree was .23 while the course instructor had an outdegree of 1.00. This indicates that participants had nearly the same number of incoming and outgoing connections.

In contrast, the RICA network had 48 nodes and 1052 edges. AGNA found that the RICA group had a density of .53. The mean betweenness centrality for the RICA group was 8.58. For the RICA group, the course instructor had a betweenness centrality of 4.61, which was lower than the mean. Compared to the control group, it is apparent that the RICA network is much less dependent upon the course instructor. The mean indegree

centrality for the RICA group was .53; the mean outdegree was also .53. This indicates that most individuals within the network are directly connected to about half of the network.

It is apparent when comparing the two graphs that the participants in the RICA program had the opportunity to develop many more connections than the participants in the control group. This is true for how many individuals the RICA participants were able to connect to, and for how many total connections each participant was able to develop.

Every member of each of the four groups in the control condition developed connections with the other members of their groups. However, they did not serve other students outside their groups. In addition all students served with the course instructor. However, the students were not able to create connections directly with the transition studio that they worked with on their service projects. Instead they were required to work with the course instructor as an intermediary between the two groups. This limited the group's ability to develop connections outside the classroom.

On the other hand each member of the RICA program was required to serve one another in several different formats, including: research, cleaning & chores, hiking, service work, etc. In addition, all students were able to develop connections with several locals that acted as intermediaries to the general public. All students were able to develop connections with eight children from the town of El Sur, where they helped in an environmental education project and tree planting exercise. Two of the teams also developed connections with six children from the town of Guadalupe, where they worked on another environmental education project and played soccer with the children. Finally,

each participant in the RICA program was able to develop connections with the Corcovado National Park staff through service work including: trail maintenance, beach litter control, and assisting cooks in clean up.

In addition you can see that in the control network the course instructor lies at the heart of the network. Without that single node, the network would break into 5 smaller disjointed networks. This makes the network very fragile and vulnerable to failure. On the other hand, in the RICA network the instructor has moved out of the center. He is no longer the sole connector, and in fact acts as an intermediary less than some of the students do.

The results of the social graph analysis are in conjunction with the hypothesis that an increase in connections, especially weak, mutually beneficial ties should increase the effectiveness of environmental programs. This portion of the research is correlation, and does not imply causation. However, the representation of the different social networks that developed in the two different programs suggests that it could play a role in the differences seen in pre-post analysis results.

Chapter 5: Discussion and Conclusions

Discussion

The main results of this thesis supported the research hypothesis that the holistic and immersive approach taken by the RICA program would have a more positive impact on student's value orientation than a more traditional education approach that incorporated service learning. Participants in the RICA program expressed significant changes in value orientation during the program in both the survey results and the journal analysis. Participants in the control group however, did not show any significant evidence that they adjusted any of their values in pro-environmental directions. In addition, according to many researchers, the findings from the network analysis would indicate that the control group would have been much less likely to shift their attitudes throughout the program than the experimental group due to the large difference in number of and diversity of connections made in the course (Boyle-Baise & Sleeter, 2000; Granovetter, 1973; King, 2004; Peterson, 2009).

With this in mind, the results from the RICA participants did have some surprises. Some variables that were predicted to shift during the program did not significantly change. For example, participants did increase their belief that business and industry should reduce their emissions to prevent climate change. However, they did not significantly change their beliefs about the government's responsibility to reduce emissions and prevent climate change, or their beliefs about their personal obligation to prevent climate change, and prevent the loss of tropical forests. This is despite the fact that they displayed an increase in values such as preventing pollution and conserving

resources, respecting the earth, and having an influence on people and events.

At first glance these results seem counter-intuitive. However, a large portion of the course focused on many of the problems that have occurred due to international policies and pressures exerted by large governments and corporations that in the long run may be detrimental to the health of the communities and environment in the places these policies affect. In addition the course emphasized the idea that social justice and equality cannot be separated from environmental issues. Because of these things, the course promoted local solutions and partnerships as effective ways to promote positive change. One could interpret these results as supporting this educational distinction. According to the journal analysis, participants did increase their feelings of responsibility towards environmental problems. However, this may not have been evident on climate change and tropical forest loss because they are very non-local problems for the students. In addition, students may have been wary to support the intervention of large entities in environmental problems due to the course. Some support for this can be found in the surveys. Although non-significant, students displayed an overall negative mean trend in their belief that the government should take strong action to prevent climate change.

Many of the significant changes found for the RICA group were socially related. Participants increased values such as social justice, equality, equal opportunities, having a world of peace free from war and conflict, having a sense of belonging, family security, forgiving/willing to pardon others, and impacting people and events. Participants also decreased their value of social power or control over others. These changes show that students on this program thought differently about social environmentalism than they had

before the immersion. In particular, it is interesting to note that participants expressed a swapping of sorts for egoistic and altruistic values. Participants expressed an increased desire to impact people and events while at the same time decreasing their desire to have social control or to dominate over others. This value change represents one of the main concepts of the course; that local communities need independence and self-direction with the support of outsiders so that they can work together in solidarity.

As a whole these value changes would indicate a desire from students to have reduced control over others while valuing their access to equal resources, environmental security, and safety from war. Students on this program were mainly environmental studies majors; because of this the majority of participants had a background in environmental issues before the course. However, very few had spent time in a developing nation before. This would support why a shift in social values was evident while environmental concern remained fairly constant.

Depending on the course goals, the changes one can expect to see will obviously vary, sometimes drastically. The author of the current study supports the idea that students expressed a social value re-orientation because of the large emphasis put on social justice. In a similar manner, the author finds it appropriate that students did not increase their sense of responsibility for preventing climate change or protecting tropical forests because the course emphasized coordinated, local efforts that focus on real, evident problems, that when implemented in many areas has the secondary effect of addressing large scale trans-national problems.

When considering the impact of these two programs, it is easy to focus on the

power of the program to affect students. However, one of the key components of service learning is that it seeks to serve community needs as well. The success of a service-learning program should at least partially be determined by the effect the program had on the community it worked with.

From a policy point of view the RICA program did very little to effect any policy applications in Costa Rica. However, the control group may have had an impact the city of Bellingham's future decisions for urban planning, which may have significant long-term effects. From an environmental perspective the RICA program participated in service that improved some environmental conditions such as reducing trash in the national parks. They also made donations and helped with population counts that may have small long-term impacts. On the other hand, the control group was involved in the development of city plans that in the long run may prevent the suburbanization of currently undeveloped land. This could potentially have a large environmental impact in the future.

From a social perspective however, the picture is very different. Based on Granovetter's (1973, 1983, 2003) theory on the power of weak connections, the RICA program had a much more powerful impact on the communities it interacted with. The impact that Costa Ricans had on RICA participants was not a one-way street. RICA participants were not the only ones developing weak ties with new and diverse individuals. The RICA participants made over a thousand connections between themselves and Costa Ricans. From a social networking perspective this experience would have had a large impact on the communities as well. Who people meet and interact with influences the way that they think about the world, other cultures, each other, and

their environment. RICA fostered connections with many people in several communities; because of this it is plausible those communities were also impacted by RICA in a similar manner that they impacted the students who spent time with them. However, the control group would have had a minimal social impact on their community because they were largely isolated and unable to develop many connections with those they were attempting to serve.

The lessons of the current research are simple. As many researchers have shown in the past, programs that attempt to promote long-term behavior and attitude reconstruction face many barriers (Dobson & Bell, 2006; Gardner & Stern, 2002; Hines, Hungerford, & Tomera, 1987; Kelly, 2006; Stern & Oskamp, 1987; Tedesco & Salazar, 2006). Stern et al. (1999) proposed that values, beliefs, and personal norms are key to producing real change. It is apparent based on the results of many past studies and this thesis that any single approach is inadequate to target all of these constructs (Gardner & Stern, 2002; Hirst, 1987; Hopper & Nielsen, 1991). The key to targeting multiple barriers is in having multiple approaches to the problem(s).

Taking a holistic approach in both methodology and examination has benefitted the current study in many ways. By combining an immersion experience with service learning, emotional connections to nature, and developing many weak positive social connections the RICA program caused students to significantly re-prioritize their values, beliefs, and norms regarding environmental problems and actions. By examining the results of this study in the form of multiple constructs it has been possible to better understand the underlying reasons for why the program worked for RICA participants as well as why it did not for participants in ESTU 436.

Researchers and educators alike have a responsibility to address large-scale global problems through their work. With any complex problem collaboration is critical. This is no less true for environmental issues than it is for any other, maybe even more so. The findings of this thesis would indicate that experts from many disciplines should start combining their approaches to produce efficient strategies for environmental education approaches. In this way more program may begin to benefit from these strategies in a similar manner that the *Rainforest Immersion and Conservation Action* study abroad course has.

Limitations of the current research

The current thesis was examining the effects of two different programs on students that were for the most part studying environmental issues. Because of this biased sample it is unclear, as of yet how a similar program would affect individuals that showed very little support for environmental problems before hand. However, it is clear that the immersion experience and eclectic nature of the RICA program was much more motivating to students than that of a traditional environmental education course.

As was evident based on the network analysis, one of the large differences between the two courses was the amount of connections made, and the diversity that they entailed. In order to maximize the influence provided by those connections, it would seem imperative to ensure that those connections are appropriate, positive, and powerful in ways that are meaningful to the course content. In this way the impact of those relationships can be directed to be in line with the course goals.

The RICA program attempted to do this on many levels. However, there was

difficulty in finding the right balance between ensuring the students welfare and protection in a novel and sometimes-dangerous environment and providing the students with a relatively direct experience with the culture and environment being studied. In order to facilitate this process, the course instructor utilized connections and friendships in Costa Rica in order to provide the students with guides and interpreters for most of the trip. Due to this, at times students would be more dependent on intermediaries that were accustomed to working with Americans rather than working hands on with locals that were more or less ignorant of who the students were and what their purpose there was.

The areas where this was not necessary were where many students expressed having the most positive interactions with locals. For example, the town of El Sur where students stayed for two nights was a very isolated, tightly knit community that depended upon both each other, and promoting tourism in their eco friendly village. In a place like this students could interact with the locals as they chose without fear of negative consequences. Being able to spend more time in these communities would allow for the students to develop richer connections to the people of Costa Rica. The author of this thesis postulates that this would result in increased long-term attitude and behavioral adjustments as well.

Another concept that is important to promote strong value reorientation is to promote feelings of reciprocity for students. This was one goal of the RICA program, which it seemed to accomplish to some degree of success. However, more could have been done to illustrate the benefits each participant received due to the monetary and physical efforts that they put forth. In addition to the service component of the program, a

portion of the program cost for each student was used to make donations to several organizations in Costa Rica. Students were told why this money was given and how it could be used to help local communities. Many of the activities that students were able to take part in were due to the donations made by the program. The participants receive large discounts from certain activities, and were allowed to stay in Corcovado much longer than the typical tourist for the same reasons. More could have been done to illustrate the benefits RICA participants also gained from these services. This type of reinforcement could help students remember that they were not there just to serve the helpless. That in fact what allowed them to accomplish the things that they did was in large part due to the service that others gave to them.

In the future, researchers should continue to examine the properties of eclectic programs for successful strategies to promote sustainability and pro-social behaviors within individuals. These combination techniques have been shown to be more effective than any single motivator (Gardner & Stern, 2002). In addition, researchers should look outside their expertise to find insight into solutions for complex problems. No single strategy will be able to overcome the many barriers to promoting large-scale shifts in attitudes and behaviors in regards to environmental problems. In order to confront these issues, we need to make peace with one another. As put by one of the guest speakers for the RICA program, we need to stop thinking about environmental security, and start thinking about environmental peacemaking. Researchers should take the same approach. Rather than seeking to promote our own disciplines we should seek to make peace with unfamiliar bodies of research, and utilize those connections for the benefit of both

disciplines.

Conclusion

Student learners are not passive agents for instructors to deposit information. Students are people, and humans are active learners that when engaged in the learning process have the opportunity to challenge assumptions and grow as individuals. Pedagogical approaches need to recognize that most of the learning that takes place within an individual happens outside the classroom. By ignoring this opportunity for continued learning instructors are missing out on a vital component to the learning process. Further, trying to teach something that is counter-intuitive to the education one receives in the real world will likely fall on deaf ears. Professors are a lone voice in the crowd, but they can also promote an environment where the crowd speaks for them.

As the RICA example has shown, when instructors take the class into the community students take much more from the course. It removes the necessity for the instructor to be a central authority on the topic, because the experience speaks for itself. Students can move from being convinced to thinking about what should be done next. More and more it seems that education is becoming a tool by which students may one day earn a higher income. Is that what education is really about, a paycheck? The answer here is clearly no. Education is about producing better citizens that can think critically, deal with complex problems, and adopt solutions that are empathetic towards the needs of others as well as the self. If students no longer take this out of the classroom then educators must make changes to their curriculums to address this deficit. In today's world we are faced with an ever-changing set of problems that are increasingly complex. No

single course can prepare students to address them all. It will take a holistic approach that is coordinated across disciplines to accomplish.

Expertise is a desirable trait because it allows an individual to think comprehensively about a give topic. However, when problems span across multiple disciplines, expertise in any single topic is similar to focusing on a lone worker ant performing its job. By itself its actions may seem meaningless because there is no context. Only by zooming out and widening ones perspective will they notice how the single ants actions are synchronized with millions of others. In order for professionals to address complex problems in the real world, they also need to zoom out to understand their knowledge in the context of an infinitely complex world.

The RICA program has been a stepping-stone to providing a comprehensive, multidisciplinary approach to addressing environmental and social problems. It has shown that by combining several approaches that a program may directly benefit from these multiple influences. The author would like to emphasize the underlying reasons for this research; environmental issues are among the most pressing and potentially disastrous dilemmas ever faced by human kind. In order to make peace with the tumultuous results of our behavior, we will need to reconcile our differences with one another, and work as a collective unit to restore the health of both our planet, and our species. The RICA program is but one example of what working together can accomplish. We still have much to learn, but positive examples are all around us. We need but look closely to find the ingredients for a mutually supportive, sustainable world. It is time to let go of our doubts, and focus on our ability to mutually support all living things around us.

Table 1

09-10 Combined, pre-post survey questionnaire

Descriptive statistics and Independent samples t-tests for equality of means

Values	Experimental Groups		Degrees of Freedom	<i>t</i>	<i>P</i>
	Pre RICA <i>M (SD)</i>	Post RICA <i>M (SD)</i>			
Social Justice, caring for the weak	4.17 (.79)	4.54 (.51)	52	2.01	.050*
Preventing pollution conserving resources	4.43 (.68)	4.79 (.41)	48.94	2.27	.021*
Equality, equal opportunities	4.24 (.87)	4.63 (.58)	51	1.85	.071
A world of peace free of war and conflict	4.10 (.98)	4.50 (.72)	51	1.65	.105
Respecting the earth harmony with nature	4.33 (.71)	4.67 (.56)	52	1.87	.067
Sense of belonging feeling that others care about me	4.20 (.71)	4.54 (.78)	52	1.68	.099
Family security safety for loved ones	4.53 (.93)	4.88 (.34)	37.93	1.85	.072
Forgiving willing to pardon others	3.93 (.66)	4.38 (.58)	50	2.57	.013*
Social power control over	2.55 (.99)	2.08 (.93)	51	-1.77	.083

others
dominance

Influence having an impact on people and events	3.76 (.99)	4.29 (.75)	51	2.17	.034*
Climate change problem for the country as a whole	2.76 (.44)	2.92 (.28)	51	1.53	.132
Business and industry should reduce their emissions to help prevent climate change	3.72 (.45)	3.92 (.28)	47.58	1.88	.066
Companies that import products for the tropics have a responsibility to prevent destruction of the forests in those countries	3.59 (.50)	3.75 (.44)	50.77	1.26	.212
The government should take strong action to reduce emission and prevent global climate change	3.80 (.41)	3.67 (.70)	35.02	-.87	.386
I feel a personal obligation to do whatever I can to prevent climate change	3.25 (.59)	3.25 (.53)	50	0.00	1.00

Do you support or oppose the environmental movement	3.48 (.63)	3.70 (.56)	50	1.27	.211
People like me should do whatever we can to prevent the loss of tropical forests	3.31 (.47)	3.5 (.59)	51	1.30	.199

Table 2

Fall 2010 ESTU 436, Control Group. Pre-post survey questionnaire

Descriptive statistics and Independent samples t-tests for equality of means

Values	Experimental Groups		Degrees of Freedom	<i>t</i>	<i>P</i>
	Pre ESTU 436 <i>M (SD)</i>	Post ESTU 436 <i>M (SD)</i>			
Family security safety for loved ones	4.71 (.47)	4.42 (.67)	24	1.33	.196
Protecting the environment, preserving nature	4.57 (.51)	4.17 (.94)	24	1.40	.176
Obedient, dutiful, meeting obligations	4.07 (.47)	3.09 (.83)	23	3.72	.001**
Wealth, Material Possessions, Money	2.79 (.89)	3.25 (.87)	24	-1.34	.193
Companies that import from the tropics have responsibility to protect those forests	4.54 (.78)	4.08 (.67)	23	-1.33	.896
I feel a personal obligation to do whatever I can to prevent climate change	4.14 (1.03)	3.58 (1.08)	24	1.35	.190
Having an impact on the global environment is within the reach of most individuals	4.21 (1.03)	3.75 (.62)	24	1.63	.117
Signed a petition in support of protecting the environment?	1.86 (.36)	1.50 (.52)	24	2.05	.052

Table 3

RICA 2010 Pre-Post Journal Assessment.

Descriptive statistics and Independent samples t-tests for equality of means

Construct	Experimental Groups		Degrees of Freedom	<i>t</i>	<i>P</i>
	Pre RICA <i>M (SD)</i>	Post RICA <i>M (SD)</i>			
Social Responsibility	.41 (.51)	.71 (.47)	32	1.75	.089
Personal Responsibility	.00 (.00)	.29 (.47)	32	2.58	.015*
Emotional connections environmental movement	.12 (.33)	.49 (.12)	32	1.63	.112
Self Efficacy	.00 (.00)	.24 (.44)	32	2.22	.034*

Appendix A

Dear RICA participant,

I am a member of a research team at Western Washington University (WWU) investigating the formation of environmental citizenship norms. We ask that you complete the questions in the online survey. Your participation is voluntary and all data will be coded so that you cannot be identified. The survey should only take about 10-15 minutes and there are no costs to you or any other party. You may withdraw from the study at any time and for any reason.

This study has been reviewed and approved according to the WWU's procedures governing your participation in this research. Responding to our survey indicates your agreement to participate in the research project entitled "Global Environmental Citizenship" conducted by Dr. Troy D. Abel, principal investigator. You can contact me if you have questions or complaints. You may also contact Ken Clark, WWU Human Protections Administrator (HPA), if you have any questions or comments regarding your rights as a participant in this research (360) 650-3220. Thank you for your consideration.

1. In the following section are a series of statement some people say guide their life. Please tell me how important each of these is as a guiding principle in you life.

	extremely unimportant	not important	neither important or unimportant	important	extremely important
Sense of belonging, feeling that others care about me					
Forgiving, willing to pardon others					
Self-discipline, self-restraint, resistance to temptations					
Loyal, faithful to my friends					
Family security, safety for loved ones					
Honest, genuine, sincere					
Honoring parents and elders, showing respect					
True friendship, close supportive friends					
Curious, interested in everything, exploring					
Respecting the earth, harmony with other species					
Unity with nature, fitting into nature					
Social justice, correcting injustice, caring for the weak					

	Extremely unimportant	Not important	Neither important or unimportant	Important	Extremely important
Protecting the environment, preserving nature					
Preventing pollution, conserving natural resources					
A varied life, filled with challenge, novelty and change					
Social power, control over others, dominance					
A world of peace, free of war and conflict					
Influential, having an impact on people and events					
Obedient, dutiful, meeting obligations					
Authority, the right to lead or command					
Wealth, material possessions, money					
Respecting the earth					
Equality, equal opportunity for all					
An exciting life, stimulating experiences					

2. In general do you think that climate change, which is sometimes called the greenhouse effect, will be a very serious problem, somewhat of a problem or won't really be a problem?

	won't really be a problem	somewhat of a problem	will be a very serious problem
For the country as a whole?			
For you and your family?			
for other species of plants and animals?			

3. In general do you think that the loss of tropical forests will be a very serious problem, somewhat of a problem or won't really be a problem?

	won't really be a problem	somewhat of a problem	will be a very serious problem
For the country as a whole?			
For you and your family?			
For other species of plants and animals?			

4. In general do you think that toxic substances in air, water and the soil will be a very serious problem, somewhat of a problem or won't really be a problem?

	won't really be a problem	somewhat of a problem	will be a very serious problem
For the country as a whole?			
For you and your family?			
For other species of plants and animals?			

5. The following statements are about addressing environmental problems.

	strongly disagree	disagree	neither agree or disagree	agree	strongly agree
The government should exert pressure internationally to preserve the tropical forests.					
I feel a sense of personal obligation to take action to stop the disposal of toxic substances in the air, water, and soil.					
Companies that import products for the tropics have a responsibility to prevent destruction of the forests in those countries.					
The chemical industry should clean up the toxic waste products it has emitted into the environment.					
People like me should do whatever we can to prevent the loss of tropical forests.					
I feel a personal obligation to do whatever I can to prevent climate change					

The government should take stronger action to clean up toxic substances in the environment.					
Business and industry should reduce their emissions to help prevent climate change.					
The government should take strong action to reduce emission and prevent global climate change.					

6. Have you engaged in any of these environmental activities?

	No	Yes
Boycotted or avoided buying the products of a company because you felt that company was harming the environment?		
Given money to an environmental group?		
Signed a petition in support of protecting the environment?		
In the last twelve months, have you read any newsletters, magazines or other publications written by environmental groups?		
Voted for a candidate in an election at least in part because he or she was in favor of strong environmental protection?		
Are you a member of any group whose main aim is to preserve or protect the environment?		
Written a letter or called your member of Congress or another government official to support strong environmental protection?		

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