

Environmental Education in Prison: A Comparison of Teaching Methods and
Their Influence on Inmate Attitudes and Knowledge of Environmental Topics

by

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ABSTRACT

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This study was designed to determine whether lecture-style or workshop-style classes might prove more beneficial in effectively teaching environmental topics to inmates. Lectures and workshops were presented to 53 male and female inmates at two minimum-security prisons in Washington State. To measure the knowledge base of participating inmates in the workshops and lectures, pre- and post-engagement surveys were designed using a five-point Likert scale to produce quantitative data, and open-ended questions were included to produce qualitative data. The findings indicate that there was a significant improvement in inmate attitudes regarding the presented environmental issues after receiving an educational opportunity, and more specifically that lecture-style presentations might be more effective in improving inmate knowledge and attitudes regarding environmental topics than workshop-style presentations. We found no significant differences in knowledge and attitudes between participants prior to the educational opportunity or between participating male and female inmates which provides evidence for environmental learning regardless of prior conditions or gender. These findings provide important insights for the Sustainability in Prisons Project (SPP) as they seek to hone their environmental education (EE) opportunities within prisons. The SPP and proven public interest through media attention, is providing evidence that a need exists for EE opportunities within correctional facilities. The findings in this study offer a contribution to the discussion surrounding EE in the prison education system, as well as whether lecture teaching methods are more effective with inmate populations than workshop methods.

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Overview

I organized this thesis into three chapters. In the first section of Chapter 1, I present an introduction to the Sustainability in Prisons Project (SPP), the scope of the study, research questions and an overview of goals for the research project. In Section 2, I present the findings of my literature review, exploring education in the prison system and the political and philosophical framework of the current system. I also explore adult environmental education and seek to find similarities and differences between the two. I discuss the influence of education on recidivism rates and potential stewardship responses as a result of environmental education, and explore the strengths and weaknesses of both lecture- and workshop-style presentations. In Section 3, I discuss the context and significance of this research project. In Chapter 2, I present my study written to fit the requirements of the *Journal of Correctional Education*. I present my hypotheses, describe the methods used in the collection and analysis of data, and discuss my study results. In Chapter 3, I discuss my results and recommendations to the SPP in terms of methods for improving educational offerings. In addition, I discuss the broader impacts and implications associated with this research. To conclude, I discuss study limitations and suggest areas for further research and analysis.

Introduction

The Sustainability in Prisons Project

The Sustainability in Prisons Project (SPP) is a partnership between The Evergreen State College (TESC) and The Washington State Department of Corrections (WSDOC). The mission of the SPP is to bring science and nature into prisons through scientific research and conservation, green-collar education and training, lecture presentations and sustainable operations of prisons (Sustainable Prisons Project About Us (2012). Retrieved May 5, 2012, from blogs.evergreen.edu/sustainableprisons/about). Inmates involved with conservation and sustainable operations projects (such as composting, recycling, gardening and rearing endangered species) are engaged daily while green collar education and science and sustainability lecture presentations are presented to interested individuals monthly throughout the year. All of the projects and educational opportunities involve inmates, college students, community partners and scientific professionals.

Currently three research and conservation projects are being conducted in prisons in Washington State: Propagation of native plants for prairie restoration, captive breeding of endangered butterflies, and captive rearing of endangered frogs. Learning skills in native plant ecology and large-scale seed production, inmates working on the prairie restoration project propagate hundreds of thousands of native plants each year. Those plants are transplanted to the largest remaining patches of South Puget Lowland prairie ecosystems located on Joint

Base Lewis-McChord (JBLM) and neighboring lands. Endangered Taylor's Checkerspot butterflies are dependent on these prairie ecosystems. Inmates learn the delicate rearing and breeding techniques and specific genetic protocols necessary for this endangered invertebrate species before their release on South Puget Lowland prairie lands. Finally, in hopes of augmenting Oregon spotted frog populations in the Puget Sound region, inmates rear these amphibians through their various life stages: from egg masses to tadpoles to adult frogs. In addition to learning protocols of frog rearing (and cricket rearing as a sustainable food source), inmates keep extensive data and assist with ongoing scientific studies (Sustainable Prisons Project What We Do (2012). Retrieved May 5, 2012, from blogs.evergreen.edu/sustainableprisons/what-we-do/).

The SPP's green-collar job training and science and sustainability lecture series are designed to reach a larger number and broader spectrum of the inmate population. Green-collar trainings have included presentations on arboriculture, energy efficiency, urban horticulture and other areas in an effort to give inmates skills they can use as contributing members of society. Lectures cover many topics from climate change to habitat restoration to ecology in an effort to spark an interest in participating inmates that may lead them to seek further science education, become involved in an on-site conservation project, or join an organization with common environmental values upon release. To assess the effectiveness of these science and educational programs, knowledge, behavior and attitudes of participating inmates are evaluated. The SPP hopes that information gathered will direct their on-going effort to bring nature into prisons.

Scope of Study

The green collar trainings and lectures offered by the SPP are presented in two styles: 1) hands-on workshops in which inmates move around, discuss presented material with one another as well as the instructor(s) and sometimes engage in a physical activity; and 2) traditional lecture format with a presenter, a PowerPoint presentation, and an opportunity for questions and brief discussion at the end. In this study I wished to determine whether the lecture- or workshop-style classes would prove more beneficial in effectively teaching environmental topics to inmates. To obtain data I co-presented lectures and workshops with Washington Department of Fish & Wildlife (WDFW) Senior Research Scientist Marc Hayes at two minimum-security prisons in Washington State. Presented material focused on the endangered Oregon spotted frog (OSF), the multiple causes of its population decline, the involved political processes and the steps being taken to augment the OSF population in the Puget Sound region.

Methods

I utilized mixed methodologies to measure the knowledge base of participating inmates in the workshops and lectures. Pre- and post-engagement surveys were designed using a five-point Likert scale and given to attending inmates to generate quantitative data. Surveys also contained open-ended questions that were evaluated through coding of specific words found in the answers. Evaluation of the surveys allowed me to analyze whether inmates gained improved knowledge

and attitudes towards the topic after receiving instruction via lecture presentation or workshop presentation.

To establish the framework for my study I conducted a literature review on both adult environmental education and prison education. Though ample opportunities exist to receive education in prison, few opportunities in the prison system address environmental education. I chose to focus on both prison education and environmental education in an effort to realize the similarities and differences present and explore the possible benefits of environmental education opportunities for inmates.

Research Questions

This study was approached using the following research questions: 1) are lectures or workshops more effective in improving inmate knowledge and attitudes regarding environmental topics? and 2) is there a difference in teaching and learning needs between male and female inmates?

Research project Goals

Currently, science and sustainability educational opportunities are offered in two prisons in Washington State once a month and they are taught by a different presenter each time. The lectures are generally not organized around a theme and each presentation stands on its own. Determination of whether lecture-style or workshop-style classes are more productive for the inmates could enhance how

the SPP conducts the educational aspects of their programming in the prison system.

Chapter 1, Section 2

Literature Review

Prison Education

Education in prison systems is often determined a success or a failure based upon current recidivism rates. Webster's Dictionary (2010) defines recidivism as: "a tendency to slip back into a previous criminal behavior pattern;" and the Washington State Department of Corrections (WSDOC) defines the term as: "a return to a DOC facility within five years as a result of a new conviction or parole violation by an offender, who either had been paroled or been discharged from such a facility" (Evans, 2010, p. 3). Without a commonly used definition, comparison of recidivism rates among different organizations and states has proven difficult (Evans, 2010, p. 6). To address this concern, WSDOC has recently adopted the Washington State Institute for Public Policy's (WSIPP) definition of recidivism: "...any felony offense committed by an offender within 36-months of being at-risk in the community that results in a Washington State conviction" (Evans, 2010, p. 4). Using the WSIPP definition will allow WSDOC the opportunity to compare recidivism data with other organizations and states, and will also allow the WSDOC to improve its evaluation of programs for offenders (Evans, 2010, p. 8).

Correctional institutions at both state and federal levels would seemingly benefit from a common definition of recidivism as this could influence decisions regarding the effectiveness of educational programs. Recidivism rates are closely tracked and seem to correspond directly with educational opportunities offered in prisons and received by incarcerated individuals. In 2003, recidivism rates for Washington offenders peaked at 34.8 percent, and by 2006 declined to 31.1 percent for released offenders. Re-offense behavior, risk level, law changes and the measure of recidivism selected (i.e., programs, sentencing, amount of supervision after release, etc.) all impact recidivism rates (Evans, 2010).

The United States currently has the highest incarceration rate in the world and also in its history, with a 350 percent increase in incarcerated people since 1980 (Schmitt, Warner & Gupta, 2010, p. 3). According to the U.S. Bureau of Justice Statistics, in 2010, 2,266,832 individuals were held in the various stages of the correctional system (2012; International Centre for Prison Studies Retrieved May 28, 2012, from www.prisonstudies.org/info/worldbrief/wpb_country.php?country=190). In addition, the dollar investment in prisons has increased dramatically in the past twenty years. In 2008, federal, state, and local governments spent \$75 billion on corrections, with most of that amount going towards incarceration (Schmitt et al. 2010, p. 10). In contrast, seven years earlier in 2001 the annual amount of public money spent on corrections was only \$35 billion dollars, almost 50% less (Cnaan et al. 2008, p. 180). Throughout this time period, relatively little of that total amount, roughly 6 percent, was used on programs such as vocational training,

life-skills training, educational programs, social activities, psychological treatments, and recreation (Cnaan et al. 2008). These are programs designed to prepare inmates for life outside of prison and research shows that society benefits from preparing inmates for reintroduction to society.

Recent studies have consistently shown a link between education and lowered rates of recidivism (Criminal Justice Center, 1994; Gerber et al. 1995; Nuttall et al. 2003; Steurer et al. 2001, as cited in Cnaan et al. 2008). Conclusions in a study based upon the impact of correctional education on inmates' post release behavior in three states (Maryland, Minnesota, and Ohio), determined that inmates who participated in correctional education while incarcerated showed lower levels of recidivism after three years. Based on these results the authors concluded that education provides a real payoff to the public in terms of crime reduction and improved employment for ex-offenders (Steurer & Smith, 2001).

Effective education programs assist prisoners with their social skills and artistic development; offer techniques and strategies to help offenders deal with their emotions; and emphasize academic, vocational and social education (Vacca 2004). In his study Vacca (2004) cites Newman, Lewis and Beaverstock (1993) who believe the 'right kind' of education works to both lower recidivism and reduce levels of violence amongst offenders (p. 298). "Moreover, appropriate education leads to a more humane and more tolerable prison environment in which to live and work, not only for the inmates but also for the officers, staff and everyone else" (Newman et al. 1993, p. 298). Educational opportunities can give inmates a focus and a purpose outside of simply serving their time.

Education in prison is important, both in preparing inmates for life after release and in providing a meaningful activity and focus during incarceration. In addition, prison education may change the inmates' general attitudes towards life and lead to improved self-esteem, confidence and self-awareness (Diseth, Eikeland, Mager & Hetland, 2008). Education may also assist in obtaining gainful employment upon release and in resisting the urge to commit further offences (Tootoonchi, 1993, as cited in Duguid et al. 2000). Duguid, Hawkey and Pawson (2000) suggest that a prisoner assumes the mantle of their particular offense and identifies with their individual label such as "thief" or "addict" or "sexual offender." The automatic placement of offenders into specific courses that cater to their particular offense further pushes that identity upon them. The identity of "student," however, avoids placing a negative identity upon incarcerated individuals (Duguid et al. 2000, p. 61). Prison education, in parallel with the values of adult education, encourages negotiation and choice, and he states that prison education also tries to build self-confidence, self-worth and develop critical thinking (Duguid et al. 2000, p. 61). These multiple benefits may coalesce to "liberate" incarcerated individuals (Bayliss, 2003, p. 161).

What characteristics of education make correctional education successful? Education in prisons is primarily focused on programs teaching literacy, adult basic education, GED (General Education Development) courses, vocational training, and post-secondary education. The vast majority of inmates enter prison without basic literary skills or job training (Hall & Kilacky, 2008, p. 301). Hall and Kilacky (2008) define success from an incarcerated students' perspective as a

concept that has meaning and achievement, and goes beyond the acquisition of a job that pays the bills (p. 305). He goes on to say that the perception of success influences student study habits, motivation to attend and persist in the classroom, as well as future educational and employment plans. These findings vary from previous literature defining success for inmates as gaining employment and remaining out of the prison system upon release (Hall & Kilacky, 2008). The participants in the Hall and Kilacky (2008) study indicated that success was more intrinsic than simply being able to locate employment (p. 307). To these incarcerated students, success meant “making it” and doing something they enjoy rather than simply paying the bills (p. 308). The inmates in the Hall and Kilacky (2008) study were motivated by their definition of success to seek out and complete educational and vocational training opportunities that may lead to success in society, regardless of employment.

Another theme explored by Hall and Kilacky (2008) is regret. Many participants in his study expressed regret for not succeeding in school and for not staying in school. They also expressed regret in not taking advantage of various opportunities presented throughout their education as well as those teachers who sought to positively influence them or make a difference in their lives. Hall and Kilacky (2008) cite the finding of Parkinson and Steurer (2004) that most prisoners have encountered some sort of academic difficulty in the past (p. 311). Negative educational experiences can influence an individual’s choice in seeking educational opportunities in the future, with many avoiding such opportunities.

A study by Mageehon (2006) on incarcerated women showed that the prior educational experiences of the prisoners influenced the type of learner (engaged, quiet, one-on-one, group work, etc.) they became in the correctional education classroom (Hall & Kilacky, 2008). Mageehon (2006) interviewed nine women, completing detention sentences in a halfway house, to gain insight into their perceptions of education. A recurring theme with the women was the discussion of characteristics that make a good teacher someone they enjoy working with and learning from. Specific traits the women identified that made an educator effective included: taking time to explain concepts rather than just assigning work, showing compassion and care, and refraining from using labels that were assigned to the students in the past such as “illiterate” or “slow learner” (Mageehon, 2006, p. 148, 149). General agreement existed regarding the long-term effects of a bad teacher, one who chastised or embarrassed the students on a personal level or in a group with their classmates. Overall, such instances created disengagement from the class and even a trepidation or lack of enthusiasm to pursue the associated subject matter further (Mageehon, 2006, p. 150).

Incarcerated students appreciated teachers who explained concepts rather than assigned work and several found value in hands-on experimentation (Mageehon, 2006). They also stated that a teacher needs compassion and understanding and should not simply teach to a pre-determined academic standard of achievement (ibid.). A “good teacher,” according to incarcerated students, is able to anticipate student need and minimize discomfort and embarrassment experienced because of labels previously placed upon them and their learning

abilities. The long-term effects of a “bad teacher” resonated with the women and overall experience with adult educators within the correctional system was mixed but most students appreciated working with teachers individually. Overall characteristics of a “good teacher” are those of a nurturer, mentor, friend, and tough-love provider (Mageehon, 2006, p. 153).

Mageehon’s (2006) study has implications for teachers at the K-12 level outside of prison as well as adult educators behind prison walls. The women’s descriptions of what makes a good and effective teacher along with what makes one ineffective, combined with their positive and negative educational experiences as children and adolescents, define education as a whole for them. In prison education, the teacher must carry much of the burden to educate effectively, but the teacher cannot do it alone, and the students must be actively engaged and committed to the program or educational opportunity (Mageehon, 2006). Receiving the desired level of commitment from incarcerated students hinges upon the teachers’ ability to communicate and engage the students in an active environment. It is also important that the incarcerated students perceive the aforementioned necessary characteristics that make a teacher “good” and that allow the student to feel comfortable with them in a learning environment (ibid.).

In correctional education the environment created in the classroom can have a direct effect on the success of the class. Incarcerated students highly value a classroom where they can both voice and debate their opinions (Rose & Voss, 2003). In their classrooms at correctional facilities, Rose and Voss (2003) sought to create a respectful environment between teachers and students as well as

among the students, encouraging them to push aside socio-economic and racial barriers while in the classroom. They cite Richard Arbenz (1994), a former student of the Soledad Prison College Program in California who states, “the coercive and authoritative milieu of the prison emphasizes submissiveness over thinking, and creates an environment antithetical to learning” (p. 30). Arbenz (1994) would like to see a reformation take place in prisons to recognize the human dignity and self worth of individuals and to encourage the full development of human personality (p. 31). In their classes, Rose and Voss (2003) also began addressing students by their last name as she expected them to address her. As a result, her students began calling one another by Mr. So and So rather than by prison nicknames further creating a sort of utopia in the classroom, intentionally rising above the subversive environment found in the rest of the prison (p. 144). Rose and Voss (2003) believe that an educator in the correctional system must be demanding yet caring, motivational, and empowering, and an expert in their field who truly enjoys teaching and working with incarcerated students. The teacher must also be able to recognize and nurture potential talent in the students, and must never give up on the students (Rose & Voss, 2003, p. 147). This belief in nurture, empowerment and tough love closely mirrors the results found in Mageehon’s (2006) study.

Educators in correctional facilities must recognize the barriers they are against and find innovative ways to move past them for the sake of the students’ personal and educational experience. Many challenges present themselves to students, educators and facilities as they seek to give and receive educational

opportunities. Many problems interfere with the incarcerated students education while in prison, such as inadequate access to computer equipment, complicated security routines, repeated transfers between prisons, disturbances in prison and lack of access to literature (Vacca, 2004, p. 300). Diseth et al. (2008) suggest that overcrowded prison populations, ineffective prison conditions, and inadequate funding for teaching personnel, supplies, and materials may hamper education in prison (p. 209). The improvement of such problems may be an important contribution to increasing educational quality (Diseth et al. 2008).

A concern presented by Bayliss (2003) is that the particular purpose ascribed to prison education is to diminish recidivism (p. 168). Not only are there too many social and economic influences associated with re-offending to isolate one factor but placing this burden on prison education may instigate its withdrawal if recidivism is not reduced (Bayliss, 2003, p. 168). Education in prisons, while difficult on many levels, is key not only to recidivism but also to individual self-esteem, another key component of success in society.

Environmental Education

Defining environmental education (EE) is an ongoing discussion resulting in a number of definitions that are relatively similar. In the article “The Concept of Environmental Education,” Stapp et al. (1969) established a base definition: “environmental education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems, and motivated to work towards their solution”

(Stapp et al. 1969, p. 34). A more modern but equally effective definition of EE is “the study of nature, earth systems, sustainability, and individual roles in making decisions and critical thinking related to environmental literacy and actions” (Heimlich & Horr, 2010, p. 58).

The Tbilisi Intergovernmental Conference on Environmental Education in 1977 established these objectives for EE: 1) awareness: acquire awareness and sensitivity to the environment and its problems; 2) sensitivity: encourage experiences in, and an understanding of, the environment and its associated problems; 3) attitudes: encourage values and concerns for the environment and motivation for participating in environmental protection; 4) skills: help acquire skills for identifying and solving environmental problems; and 5) participation: provide opportunities for active involvement in working towards resolution of environmental problems (Hungerford & Volk, 1990, p. 258).

These objectives go beyond learning, and into changes in attitude and necessary action steps, which are often challenges for educators. Hungerford and Volk (1990) observed that the challenge for educators is to translate the Tbilisi objectives into instructional reality (p. 258). Many educators believe that behavior can be modified through learning. To that end, Hungerford and Volk (1990) argue that in educating for responsible environmental behavior, instruction must go beyond “awareness” and “knowledge” of issues, and into “ownership” and “empowerment” prompting individuals to become responsible, active citizens (p. 267). Education is always valuable for teaching knowledge and awareness, but in the case of EE, educators need to learn to teach in a manner that is different

from the “norm” (Hungerford and Volk, 1990). More of a need exists to connect with individuals so they feel the issues resonate within them and not only outside of their selves or their circumstances.

In “Philosophies of Adult Education,” Walter (2009) points out that most EE opportunities take place either with children in the K-12 schooling system or with university students in environmental studies programs in higher education (p. 4). A wealth of research exists regarding EE for children and adolescents. It has long been the understanding that EE is of utmost importance for the younger generation, to teach them values, skills, and an ongoing interest in environmental issues. Though great value exists in targeting the younger audience, adult learners should not be ignored. For this literature review, the focus will be on EE for adults.

Clover (2003) explores the basis of Environmental Adult Education (EAE), through awareness-raising and individual behavior change. She concludes that in order to effectively progress in EAE people must imagine and develop alternatives through consciousness-raising and collective political work rather than through awareness-raising and behavior change (Clover, 2003, p. 5). In this respect, Clover (2003) agrees with Hungerford and Volk’s (1990) conclusion that adults need ownership and empowerment as drivers for environmental action. Along those same lines of thought, Heimlich and Horr (2010) believe that if we are to enhance adult learning opportunities in environmental settings, understanding the contextual differences of learning throughout our lifespans and within different settings is important (p. 58). Adult learning opportunities vary

greatly from museum and arboretum-type environments to more hands-on opportunities such as shoreline clean-ups and restoration projects. Many researchers are interested in what drives the adult to seek these learning opportunities.

It is generally thought in education that the teacher and teaching opportunities drive the learning; however, Heimlich and Horr (2010) argue that in EE, the need of the individual drives what information is taken in, filtered, framed and applied as meaningful (p. 58). Acknowledging student backgrounds and prior knowledge in a subject is important because many times people are driven to a location or a learning opportunity due to personal interest or because of knowledge previously attained. Often adult learners attend learning opportunities for others, such as children, rather than for their own edification. Also, the social role with which one enters an environmental learning setting should be considered. In these instances, the authors propose that adult learners previously attained ideas and knowledge on the subject matter will frame any new knowledge taken in (Heimlich and Horr, 2010).

Heimlich and Horr (2010) believe that learners have their own motivations and that those goals are rarely the same as the goals of the institution (p. 59). To address this issue, instructors should be aware of the diversity within a group of adult learners and recognize that each comes with their own history and level of interest (p. 59). Walter (2009) stresses the need for adult educators to critically question their own philosophies of education, to try on new roles as instructors, to test assumptions about adult learners and to experiment with new educational

practices (p. 22). These steps should be taken in an effort to better reach the learning audience who come to the experience with varying objectives.

Haugen (2006), in her article “Environmental Adult Educator Training: Suggestions for Effective Practice”, also stresses a focus on the need to train EAE teachers and different techniques to do so. She believes that EAE is a viable solution to the world's mounting environmental problems. In a time when globalization threatens sustainable development worldwide, it is crucial to communicate clear ideas about EAE and how it contributes to fighting environmental degradation (Haugen, 2006, p. 91). It is important to bring EAE research into the practical realm, and Haugen (2006) recommends the “Seven Steps of Training Design” created by Vella (2001, 2002) (p. 95).

The “Seven Steps of Training Design” are: who, why, when, where, what, what for and how.

“The who refers to the participants, facilitators and other stakeholders; the why is the situation that calls for training; the when is the time frame; where refers to the site of the training; the what is the content or the knowledge, skills and attitudes facilitators want learners to come away with; the what for is the achievement-based objectives; and the how is the actual materials and learning tasks facilitators plan to use” (Vella, 2001 as cited in Haugen 2006, p. 96).

Haugen (2006) sees this method as a valid benchmark to guide trainers of environmental adult educators, and appropriate in its incorporation of adult

learning principles and dialogical education (p. 97). Many techniques are used in teaching EAE; however, Haugen (2006) has identified a need for more research into EAE training of EAE instructors.

What are effective teaching methods in EAE? In a study conducted by Lord (1999), traditional and constructivist teaching methods in environmental science were compared. The control group was a traditional lecture-style classroom and the experiment group was taught utilizing a constructivist method in which the students were very involved with each other and the teacher. Lord (1999) selected a constructivist model based on the Science Curriculum Improvement Study (SCIS) mainly because it encourages peer interaction in resolving instructor-generated problems as students develop their understanding of science (Lord, 1999). The model's constructivist design is centered on five instructional phases: Engage, Explore, Explain, Elaborate and Evaluate. According to the chief architect of the plan, Rodger Bybee (1993), the Engage phase is used to motivate, the Explore phase encourages small group discussion, the Explain phase allows description amongst students of discoveries made, the Elaborate phase permits the expansion on the topic and the Evaluate phase provides the students a means of assessing what they have learned (Lord, 1999).

The results of Lord's (1999) study showed that students in the control group often missed questions based on interpretation, analyzing, and critical thinking that the constructivist-taught students did not miss. From this the author surmises that students taught with the constructivism method understood the course material in a much deeper and more comprehensive way (Lord, 1999).

Further evaluations showed that the students who received the constructivist method class found it more enjoyable and informative than the control group (Lord, 1999). This result is important for educators in non-major college courses or in informal EAE settings where the adult learner receives education that is not their specialty. It is imperative in such situations that the educator provides an enriching, stimulating and worthwhile learning experience for the student (Lord, 1999).

The type of learning where the student has chosen an area of interest or a location in which to experience new EAE opportunities is called free-choice learning. Free-choice learning is the learning people do when they get to control what to learn, when to learn, where to learn and with whom they learn (Taylor & Neil, 2008, p. 28). Various settings for free-choice learning exist including museums, aquariums, zoos, botanic gardens, science and visitor centers, and nature tours (Zeppel, 2008, p. 5). Three learning outcomes from free-choice EAE have been identified: incidental outcomes (newfound appreciation skills, and self-confidence), broader outcomes (adoption of environmental values), and affirmative outcomes (identity building; Storksdieck, Ellenbogen & Heimlich, 2005 as cited in Zeppel 2008, p. 28).

Zeppel (2008) analyzed whether free-choice visitor learning during mediated wild marine animal encounters contributed to changed attitude and behavior and whether visitors had long-term intentions to engage in conservation actions. She found that interpretive programs highlighting species biology and human impacts influenced visitors' attitudes, beliefs and conservation outcomes;

whereas guided interactions on tours motivated respect for wildlife and fostered environmentally responsible attitudes and behaviors, and also benefited marine conservation (Zeppel, 2008, p. 11). A challenge such programs face is delivering effective conservation messages while responsibly managing the desire of visitors for close, physical interactions with marine wildlife (Zeppel, 2008, p. 13).

Environmental Education in free-choice, non-formal settings provides unique challenges for educators: visitors can come and go as they please, a high degree of heterogeneity generally exists amongst participants, there is constant potential for distractions, and educational personnel may have little systematic teacher educational training (Taylor & Neil, 2008, p. 25). Though a challenge for educators, a non-formal environment can feel free and relaxing for visitors. The learning experience is in the visitors' control, allowing them freedom of movement and potentially increasing satisfaction with the experience (Taylor & Neil, 2008, p. 28).

In most cases, educators have only one opportunity to provide a basic understanding of environmental problems and to attempt to positively change attitudes and possibly behaviors (Bush-Gibson & Rinfret, 2010, p. 81). In this single opportunity they must also provide evidence of how behavior changes are beneficial and provide lists of opportunities available for the learner to participate in going forward (Bush-Gibson & Rinfret, 2010, p. 82). Cognitive psychologists point out that lasting knowledge occurs when a learner attempts to make sense of new information by applying it to their already perceived notions about the topic (a Constructivist approach to learning). True understanding takes place once the

new information is properly assimilated in the learner's established knowledge (Lord, 1999). Educators must influence change in the everyday lives of learners, thus enabling new information to take root and grow towards long-term attitude and behavior change (ibid.).

Education is the key to our ability to reach environmental sustainability as a society (Haugen, 2006, p. 93). Environmental Adult Education has strong roots in community development, popular education, and social justice and has the potential to foster environmental awareness and action among adults, social institutions, and social movements (Walter, 2009, p. 21). Though environmental transformations are not always clear-cut or achievable, educators on both the formal and non-formal level are engaged in environmental opportunities that are both beneficial to environmental education as a whole and EAE specifically (Bush-Gibson & Rinfret, 2010, p. 85). Though obtaining the TICEE objectives to go beyond learning, and into changes in attitude and necessary action steps is an ongoing challenge in EE, it is being met by educators and interested citizens alike. Meeting these objectives and continuing to reach many audiences with effective EE is a key component to environmental global sustainability.

Environmental Education in Prisons

Educational opportunities in prisons cover a broad spectrum of learning, training and rehabilitation. Environmental education (EE) opportunities in prisons are growing in popularity but are not yet as prevalent as other educational focuses. Currently, EE is being introduced into prisons in the form of animal training and

rehabilitation, organic gardening, science lectures, sustainable operations such as composting and recycling, green job training and conservation programs. Prisons house individuals who may not have training in animal rehabilitation, gardening or science but who do have time and a need for intellectual stimulation that can be filled by supervised research (Ulrich & Nadkarni, 2008, p. 816). If the goal of correctional institutions is to transform individuals, then the whole person along with needs, emotions and attitudes must be considered (Deaton, 2005, p. 47). One way to do this is through the use of animals in correctional facilities.

Currently a number of different animal programs exist in prisons. Inmates train service dogs for the disabled, train dogs and cats for adoption by the public, rehabilitate retired racehorses and tame wild mustangs (programs are currently underway in AK, AZ, CA, CO, FL, IL, IN, KY, LA, MA, NC, NM, NY, OK, OR, VA, WA, WI, and WY). These programs provide vocational skills for the inmates and a valuable service to the community. On another level, they are also highly therapeutic programs as they offer meaningful experiences for the inmate through which many life lessons are learned (Deaton, 2005, p. 47). Deaton (2005) cites a study conducted in Lima, Ohio in 1981 that compared patients on a ward with pets, and patients on a ward without pets. On the ward with pets, patients needed less medication, had drastically reduced violent incidents and no suicide attempts; in contrast, the ward without pets had eight suicide attempts (Deaton, 2005, p. 50).

With the introduction of wild mustangs to a correctional facility in New Mexico in 1995, the state saw a reduced recidivism rate amongst those individuals

who worked with the horses prior to their release (Deaton, 2005, p. 52). Animals in prisons can facilitate transformative changes within the individuals that work with them which cannot easily be matched using other methods. Inmates not only learn new skills but are engaged physically, mentally, and most of all emotionally with the animals (Deaton, 2005, p. 59).

Ulrich and Nadkarni (2008) report on a three-part study of environmental programs that took place at Cedar Creek Correctional Center (CCCC) for men in Washington State under the direction of the SPP. The three projects, growing moss in prisons, implementing and maintaining a composting and vermiculture system and a monthly science lecture series resulted from a partnership among ecologists, sustainability practitioners, correction administrators and inmates (Ulrich & Nadkarni, 2008, p. 816). All three projects received positive responses from inmates and prison staff. Inmates were engaged and patient in the tedious and repetitive task of watering and growing various mosses, which was attributed to their being active and valued participants in solving an environmental issue (Ulrich & Nadkarni, 2008, p. 830). Upon learning composting and gardening techniques, many inmates expressed the desire to continue the practice outside of prison, and one participant went on to enroll in a horticulture program upon release (Ulrich & Nadkarni, 2008). In the science lectures, inmates and WSDOC staff actively participated as learners together and were treated as equally interested and engaged students by the presenters (Ulrich & Nadkarni, 2008, p. 827).

Early research on SPP programming showed reductions in waste and cost

savings, while teaching new skills to inmates were not only possible but were very successful in correctional facilities (Ulrich & Nadkarni, 2008). Currently, every prison in Washington State participates to some degree in SPP programming, which brings maintenance costs down while benefitting the environment and individual inmates involved with the sustainability projects. In this way, “state institutions can be role models for how to enact a sustainable lifestyle that will limit their impact on the environment” (Ulrich & Nadkarni, 2008, p. 831), and the results of this research can be implemented in various enforced residential programs.

Though few research papers exist on EAE in prison systems, there are many news reports and editorials featuring such projects, which express an interest on behalf of the public. Dr. Nadkarni’s introductory project at CCCC was integral in starting the SPP that is leading the field of sustainability, conservation and science education programming within prisons in Washington State. The SPP was recently awarded a National Science Foundation grant funding their proposal to host a conference focused upon creating a national SPP network. This will allow for collaboration, sharing of ideas and further evaluation of the impacts EAE and science projects within prisons and their influence on incarcerated individuals and their communities.

Chapter 1, Section 3

Context and Significance

Because of a deficit in research on EAE in prisons, this project is especially

significant as it will contribute to our understanding of this topic. It could also influence how the SPP presents educational opportunities in prisons for incarcerated men and women in Washington State. Refined teaching methods may help the SPP reduce recidivism rates through informing inmates of various environmental, educational and green collar job opportunities. The inmates in the selected minimum-security prisons will be released within five years, making them an important audience to reach for possible career opportunities. The lecture and workshop series will also contribute to a connection between the scientific community, Washington Department of Fish and Wildlife, students at The Evergreen State College, and Washington State Department of Corrections. This thesis project will contribute to the literature regarding EAE in the prison education system. It will also contribute to the discussion of whether workshop- or lecture-style teaching methods are more effective with the inmate population than another.

In Chapter 2, I will discuss my research and results supporting whether lecture-style or workshop-style presentations are more effective when teaching an inmate population. This chapter is written to fit the requirements of the *Journal of Correctional Education*, a publication that serves as a resource for: 1) academic research in correctional institutions; 2) current issues and legislative updates in correctional education; and 3) best practices for correctional educators (Ashland University Journal of Correctional Education (2012). Retrieved June 25, 2012 from www.ashland.edu/professionals/locations/gill-center-business-economic-education/journal-correctional-education). When working in a correctional

facility, a significant amount of preparation and coordination takes place between presenters and WSDOC staff. The methods section in Chapter 2 outlines many of the necessary steps taken to conduct this study, however, an extended methods description can be found in Appendix A.

Chapter 2

A manuscript formatted for the *Journal of Correctional Education*

Abstract

This study was designed to determine whether lecture-style or workshop-style classes might prove more beneficial in effectively teaching environmental topics to inmates. Lectures and workshops were presented to 53 male and female inmates at two minimum-security prisons in Washington State. To measure the knowledge base of participating inmates in the workshops and lectures, pre- and post-engagement surveys were designed using a five-point Likert scale to produce quantitative data, and open-ended questions were included to produce qualitative data. The findings indicate that there was a significant improvement in inmate attitudes regarding the presented environmental issues after receiving an educational opportunity, and more specifically that lecture-style presentations might be more effective in improving inmate knowledge and attitudes regarding environmental topics than workshop-style presentations. We found no significant differences in knowledge and attitudes between participants prior to the educational opportunity or between participating male and female inmates which provides evidence for environmental learning regardless of prior conditions or gender. These findings provide important insights for the Sustainability in Prisons Project (SPP) as they seek to hone their environmental education (EE) opportunities within prisons. The SPP and proven public interest through media attention, is providing evidence that a need exists for EE opportunities within correctional facilities. The findings in this study offer a contribution to the discussion surrounding EE in the prison education system, as well as whether lecture-style teaching methods are more effective with inmate populations than workshop-style methods.

Introduction

Education in prisons is primarily focused on programs teaching literacy, adult basic education, GED courses, vocational training, and post-secondary education

(Cnaan et al. 2008). Many inmates enter prison without basic literary skills or job training, so there is certainly a need for education to focus in those areas; however, there is also a need for Environmental Education (EE) in prisons. Work with nature and living organisms in EE programs may create a therapeutic environment and can engage inmates on a physical, mental, and emotional level that is often lacking in correctional facilities. In addition, EE programs may directly benefit sustainable practices within correctional facilities by reducing costs through composting, recycling, and gardening programs (Julie Vanneste, Washington State Department of Corrections, personal communication) while engaging inmates in jobs and skills that will benefit them post-release. In this way, there is great potential for EE programs to benefit inmates and broader society alike.

The United States has the highest incarceration rate in the world, and also in its history, with a 350 percent increase in incarcerated people since 1980 (Schmitt, Warner & Gupta, 2010). According to the U.S. Bureau of Justice in 2010, 2,266,832 individuals were held in various stages of the correctional system (International Centre for Prison Studies World Prisons Brief, 2012). In addition, the dollar investment in prisons has increased dramatically in the past twenty years. In 1996, \$22 billion dollars were spent on state and federal corrections (Cnaan et al., 2008) compared to 2008 when \$75 billion were spent on state and federal corrections (Schmitt et al. 2010). Throughout this time period, relatively little of that total amount, roughly 6%, was used on programs such as vocational training, life-skills training, educational programs, social activities, psychological

treatments, and recreation (Cnaan et al. 2008). These are programs designed to prepare inmates for life outside of prison and research shows that society benefits from preparing inmates for reintroduction to society.

Recidivism rates are closely tracked and often seem to correspond directly with educational opportunities offered in prisons and received by incarcerated individuals (Evans, 2010). Approximately 1,600 inmates are released from prison daily and recidivism rates suggest that successful re-entry into society is difficult at best (Cnaan et al. 2008). Effective education programs help offenders with their social skills and artistic development, offer techniques and strategies to help inmates deal with their emotions, and emphasize academic, vocational and social education (Vacca, 2004). This 'right kind' of education both lowers recidivism and reduces the level of violence in prison (Newman, Lewis and Beaverstock 1993). Moreover, appropriate education can lead to a more humane and tolerable prison environment in which to live and work, not only for the inmates but also for the officers, staff and visitors (Newman et al. 1993).

Education in prison is important both in preparing inmates for life after release and in providing a meaningful activity and focus during incarceration. In addition, prison education may change the attitudes of inmates towards life and lead to improved self-esteem, confidence, and self-awareness. Prison education, in parallel with the values of adult education, encourages negotiation and choice and tries to build self-confidence, self-worth, and develop critical thinking (Duguid, Hawkey and Pawson, 2000). Many challenges present themselves to students, educators, and facilities as they seek to give and receive educational

opportunities in prison. Educators in correctional facilities must recognize potential barriers and find innovative ways to move past them for the sake of the students' personal and educational experience. Overcrowded prison populations, conditions, and inadequate funding for teaching personnel, supplies, and materials may hamper education in prison and the improvement of such problems may be an important contribution to increasing education quality (Diseth, Eikeland, Mager, and Hetland, 2008, p. 209; Diseth et al. 2008). Currently many faith-based programs, art programs and vocational training programs are provided by non-profit groups, however one area of education and training that has received little attention is environmental education.

Environmental education (EE) is defined as “the study of nature, earth systems, sustainability, and individual roles in making decisions and critical thinking related to environmental literacy and actions” (Heimlich & Horr, 2010). The objectives of EE go beyond learning content, and into changes in attitude, life-style and behavior. Though EE opportunities in prisons are growing in popularity they are not yet as prevalent as other educational foci. Some common types of EE in prisons are in the form of animal training and rehabilitation, organic gardening, science lectures, sustainable operations such as composting and recycling, green job training, and conservation programs. Prisons house individuals who may not have training in animal rehabilitation, gardening, or science but who do have time and a need for intellectual stimulation that can be filled by supervised research (Ulrich & Nadkarni, 2008).

Ulrich and Nadkarni (2008) report on a three-part study of environmental programs that took place at Cedar Creek Correctional Center (CCCC) for men in Washington State. The three projects, growing moss in prisons, implementing and maintaining a composting and vermiculture system, and a monthly science lecture series resulted from partnerships among ecologists, sustainability practitioners, correctional administrators, and inmates (Ulrich & Nadkarni, 2008). All three projects received positive responses from inmates, prison staff, and the media. Inmates were engaged and patient in the tedious and repetitive task of watering and growing various mosses, which was attributed to their being active and valued participants in solving an environmental problem (Ulrich & Nadkarni, 2008). Upon learning composting and gardening techniques, many inmates expressed the desire to continue the practice outside of prison, one participant went on to enroll in a horticulture program upon release (Ulrich & Nadkarni, 2008), and the lead author of the paper who was incarcerated at the time is now pursuing a doctoral degree in the sciences.

Though few research papers exist on EE in prison systems, there are many news reports and editorials featuring recent projects, which highlights public interest in this work. The Sustainability in Prisons Project is leading a national movement of sustainability and science in prisons in Washington State. The SPP was recently awarded a National Science Foundation grant funding their proposal to host a conference focused upon creating a national SPP network. This will allow for collaboration, sharing of ideas, and further evaluation of the impacts EE

and science projects within the prisons are having upon incarcerated individuals and communities.

As communities continue to tax natural resources, the need for environmental sustainability increases at a time when resources are stretched and limited. The controlled environment of a prison creates an opportune setting for the study of sustainability as well as science programs with EE connections. Considering the majority of inmates will be released, it is a benefit to them and to society to give them the skills that can help procure green jobs, create environmental awareness, and gain the knowledge to seek out and participate in environmental activities. While inside prison walls, EE learning opportunities and programs can give inmates the opportunity to feel connected to the outside world, both intellectually and physically.

The general belief in EE is that a hands-on workshop-style experience is a more effective mode of teaching and learning about various environmental topics. Enabling an EE student with the opportunity to engage their senses and to take an active role in their learning is rewarding to both teacher and student, and often results in a formative experience for the learner. Hands-on and in the field experiences may give the learner confidence to act on the knowledge gained in the learning environment in a way that learning inside of a classroom cannot. Based upon the idea that such experiential learning environments are more productive in teaching EE, our hypothesis is that workshop-style presentations will be more effective in conveying content and improving knowledge and attitudes of participating incarcerated students regarding environmental topics.

Theoretical framework

The Sustainability in Prisons Project

The Sustainability in Prisons Project (SPP) is a partnership between The Evergreen State College (TESC) and The Washington State Department of Corrections (WSDOC). The mission of SPP is to bring science and nature into prisons through scientific research and conservation, green-collar education and training, lecture presentations, and sustainable operations of prisons (www.sustainableprisons.org 2012). Inmates involved with sustainable operations and conservation projects (such as composting, recycling, gardening, and the rearing of endangered species) are engaged daily while green collar training and science and sustainability lecture presentations are presented to interested incarcerated individuals monthly throughout the year. All of the SPP programs and educational opportunities involve inmates, college students, community partners, and scientific professionals.

The SPP's green-collar job training and science and sustainability lecture series are designed to reach a larger number and broader spectrum of the inmate population. Green-collar trainings have included presentations in arboriculture, energy efficiency, urban horticulture, and other areas in an effort to give inmates skills they can use as contributing members of society. Lectures cover many topics from climate change to habitat restoration to ecology in an effort to spark an interest in participating inmates that may lead them to seek further education, become involved in an on-site conservation project, or join an organization with

common environmental values upon release. To assess the effectiveness of these science and educational programs, knowledge, behavior, and attitudes of participating inmates are evaluated. The SPP hopes that the information gathered will direct their on-going effort to bring nature into prisons.

Scope of study

The green collar trainings and lectures offered by the SPP are presented in two styles: Hands-on workshops in which inmates move around, discuss presented material with one another as well as the instructor(s), and sometimes engage in a physical activity; and in traditional lecture format with a presenter, a PowerPoint presentation, and an opportunity for questions and brief discussion at the end. In this study we wished to determine whether the lecture- style or workshop-style classes would prove more beneficial in effectively teaching environmental topics to inmates. To obtain data, lectures and workshops were co-presented with Washington Department of Fish & Wildlife (WDFW) Senior Research Scientist Marc Hayes at two minimum-security prisons in Washington State. Presented material focused on the endangered Oregon spotted frog (OSF), the multiple causes of its population decline, the involved political processes, and the steps being taken to augment the OSF population in the Puget Sound region. The research questions with which we approached this study were: 1) Is content knowledge and attitudes of participating incarcerated students regarding environmental topics improved via a lecture-style or workshop-style educational opportunity, and 2) is there a difference in content knowledge and attitudes

between participating male and female incarcerated students that receive the educational opportunity?

Methods

Study design

In April 2012, lectures and workshops were presented at two minimum-security prisons in Washington State. Because of the interest created by SPP, we knew that at each prison we would have some attendees who were involved with or exposed to the conservation projects within those facilities, and some that were not. We also felt that due to their imminent release, we may have inmates seeking educational opportunities that could influence their direction and choices once outside of the prison system.

Both prisons are work camp-style prisons and inmates have jobs they perform either on or off grounds. If they are not working, then they are in educational, social, or rehabilitative classes. Informative flyers were posted throughout each prison inviting inmates to attend and to sign up for one of the presentation times. Inmates were not aware that there would be different presentation styles; they chose simply based upon what time slot they preferred. Given that the presentations were in conflict with rest time, recreation time, and in the case of MCCCW, with other classes, our attendance was relatively low, but equally so at both prisons. At MCCCW, we had 10 attendees at the workshop presentation and 13 at the lecture, and at CCCC, we had 16 attendees at the workshop presentation and 14 at the lecture, for a total of 53 participants.

Each session lasted for 2 hours and included time to complete pre- and post-engagement surveys. The lecture-style presentation was 90 minutes and we utilized PowerPoint, with 15 minutes for questions at the end. The workshop-style presentation was also 90 minutes and utilized PowerPoint to present some of the same slides as the lecture; however, throughout the workshop, handouts were used for groups of 4 or 5 inmates to discuss the material. Leading questions were asked about the content of each handout to facilitate conversation among the inmates and between inmates and presenters. During the lecture, inmates sat together, but faced the presenter whereas during the workshop, inmates faced the presenter at times, and at other times faced each other. In both presentation types there was quite a bit of interaction amongst the inmates, though it felt more focused and purposeful during the workshops.

Operating under the SPP's Human Subjects Review with the Washington Department of Health and Social Services, pre- and post-engagement surveys were designed using a five-point Likert scale. Evaluation of the surveys allowed for the analysis of whether inmates gained improved knowledge and attitudes toward environmental topics after receiving instruction via lecture-style or workshop-style presentations. The surveys consisted of both quantitative and qualitative questions, some of which were repetitive from pre- to post-engagement survey to determine if answers changed after receiving the presentation. The surveys were developed utilizing a template provided by the SPP, and tailored to suit this topic and area of interest. The surveys were

submitted to both MCCCW and CCCC for their approval prior to providing them to inmates at the presentations.

Statistical Analysis

Mixed methodologies were utilized to measure the knowledge base of participating inmates in the workshops and lectures. Quantitative data were generated from comparison of the five-point Likert scale questions on the pre- and post-surveys, and qualitative data were generated from open-ended questions included on the post-survey.

In order to determine if knowledge and attitudes differed between groups, Chi-squared tests were performed on pre- and post-engagement survey data, followed by adjusted G-statistic tests to correct for the small sample size. Next, percent improvement values was calculated for each question to compare the two different presentation types and male to female inmates, followed by t-tests on the percentage improvement results.

To assess differences in attitudes and knowledge across all questions simultaneously pre- and post-survey, multivariate analyses were used. A Bray-Curtis Distance measure was used to determine similarity among knowledge base and attitudes for inmates receiving different educational opportunities, and at male and female institutions. Multi-response permutation procedures (MRPP) were used to determine if significant differences in knowledge base or attitudes were apparent between pre- compared to post-engagement surveys, lectures compared to workshops, and males compared to females. These statistical

analyses were paired with non-metric multidimensional scaling ordinations to visualize differences between groups.

Open-ended questions were evaluated qualitatively through coding of specific words found in answers to those questions. Coded words were chosen based upon the content of the presentations and what we hoped participating inmates received from the presentations. The coded words were tallied by inmate's attendance at either the lecture-style or workshop-style presentation, and were compared to identify similarities between learned content according to the style of presentation attended. Using this method we were able to see whether communication and presentation of content remained consistent between the lecture-style and workshop-style presentations.

Results

The most striking finding from this study is that there was a significant improvement in inmate attitudes about the environment and knowledge of endangered species issues after receiving an educational opportunity. Be it lecture or workshop format, male or female students, the participants learned from and enjoyed the educational experience they were offered. Mean improvement scores did not differ between male and female students ($t_{(37)} = 0.200$, $p = 0.4213$), but showed an overall increase in content knowledge by 12% following both presentation types on average (Figure 1).

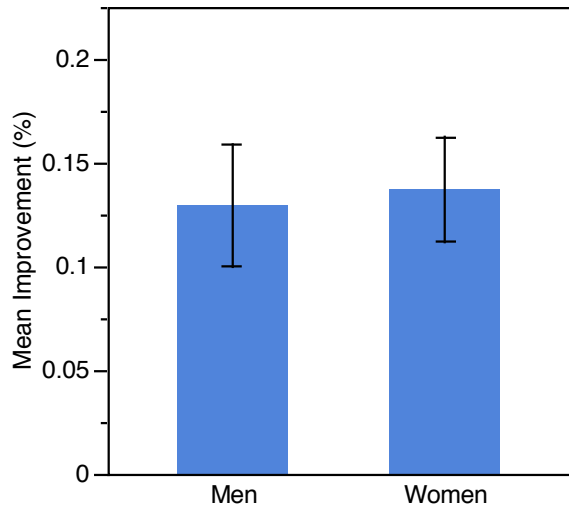


Figure 1: Mean percent improvement of the scores of men and women following both the lecture-style and workshop-style presentations. Mean improvement scores were determined by comparing pre- to post-engagement survey responses and did not differ between males and females. Values represent means +/- 1 standard error of the mean.

Interestingly, when you examine all survey responses as an assemblage of knowledge and attitudes using multivariate statistics, we see a significant shift in overall responses following both presentation types (Figure 2). Using ordination methods to create a visualization of the entire assemblage of inmate attitudes and knowledge at an individual level, each gray triangle represents an individual's pre-presentation attitude and knowledge; and each black triangle represents an individual's post-presentation attitude and knowledge (Figure 2). The graph shows that inmates came in with highly variable degrees of attitude and knowledge as illustrated by the widely scattered gray triangles. After the educational opportunity, their attitudes and knowledge converge in one area, representing a new assemblage of attitudes regardless of presentation style. Analyzing all data together in this way shows that pre- and post-test results are significantly different ($\alpha = 0.050$, $p < 0.0001$), so overall, the presentations were successful in communicating about an important environmental issue.

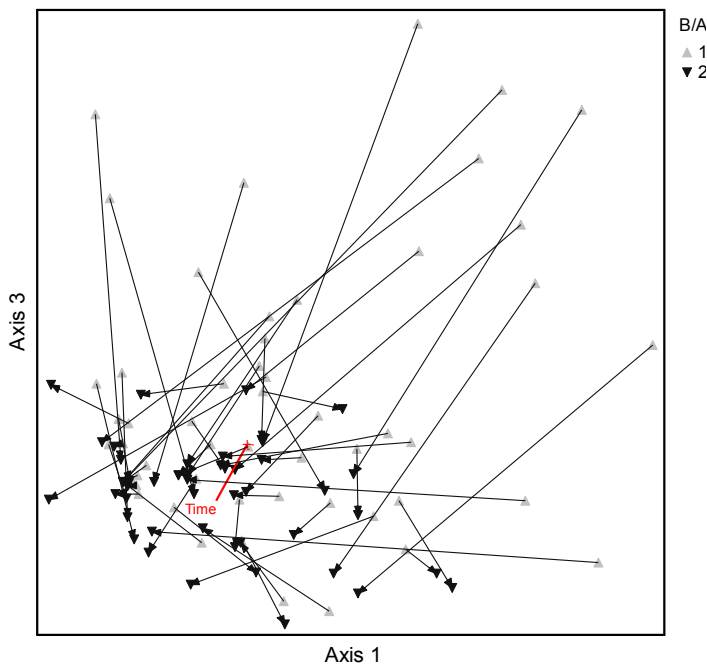


Figure 2: Ordination plot showing every participating inmate's response prior to (▲) and after (▲) receiving a lecture-style or workshop-style presentation. Lines connect each inmate's pre- to post-engagement survey responses and show a convergence of attitudes and knowledge following an educational opportunity regardless of presentation style.

Similarly, when examined separately, pre- and post-engagement survey responses for lecture-type presentations (Figure 3-left panel) and workshop-type presentations (Figure 3-right panel) show a convergence of attitudes and knowledge following the educational experience. The assemblage of survey responses is significantly different prior to the educational experience than following it, for both lectures ($A = 0.054$, $p < 0.001$) and workshops ($A = 0.035$, $p = 0.001$), but the difference is larger for lectures than workshops (when comparing A values).

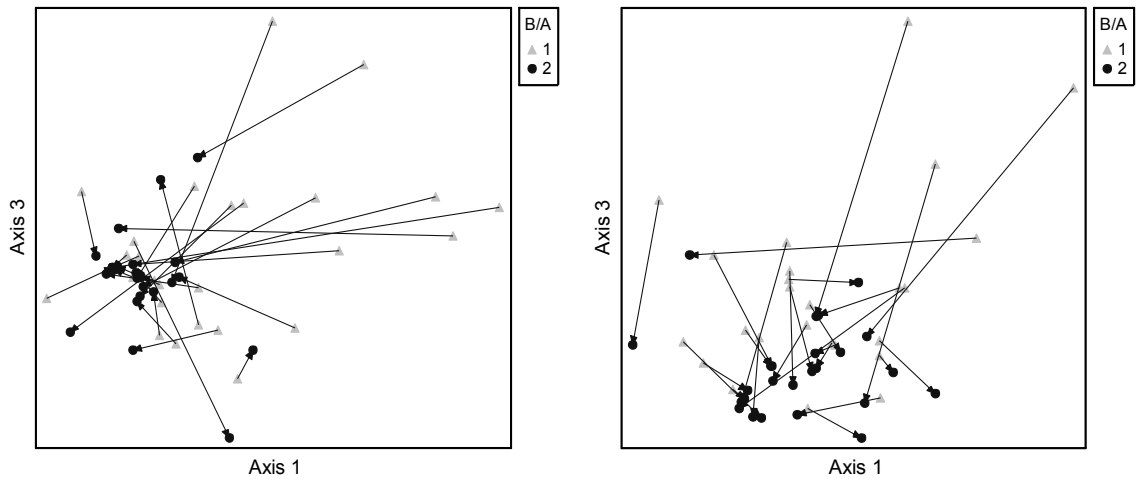


Figure 3. Left panel: Pre-survey results compared to post-survey results for lecture-style presentations, Right panel: Pre-survey results compared to post-survey results for workshop-style presentations.

Mean improvement scores were compared for male and female incarcerated students separately. A t-test was run on the percentage improvement results and although results show there are no significant differences between mean improvement scores following lectures compared to workshops, there is a strong trend that shows survey responses may improve more dramatically following a lecture than a workshop (Figure 4).

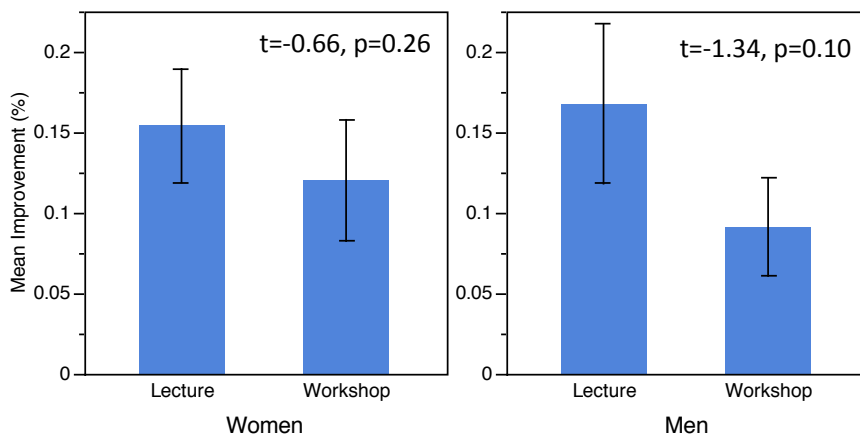


Figure 4. Lecture-style vs. workshop-style presentations are compared using mean improvement scores for incarcerated women and men separately. Improvement scores compare pre- to post-engagement survey responses. Values represent means +/- 1 standard error.

It is also possible to compare the assemblage of survey responses prior to engagement between lecture-style and workshop-style presentations. Importantly, the assemblages of attitudes and knowledge do not differ between lecture and workshop participants for pre-engagement surveys ($A = -0.002$, $p = 0.558$; Figure 5). This means that there was no bias in our random selection of participants for each engagement type. In addition, participating inmates came into their presentation with varying types of environmental attitudes and content knowledge. In contrast, post-engagement survey responses did differ by presentation type, showing that lectures and workshops might influence attitudes and content knowledge differently overall ($A = 0.027$, $p = 0.012$; Figure 6).

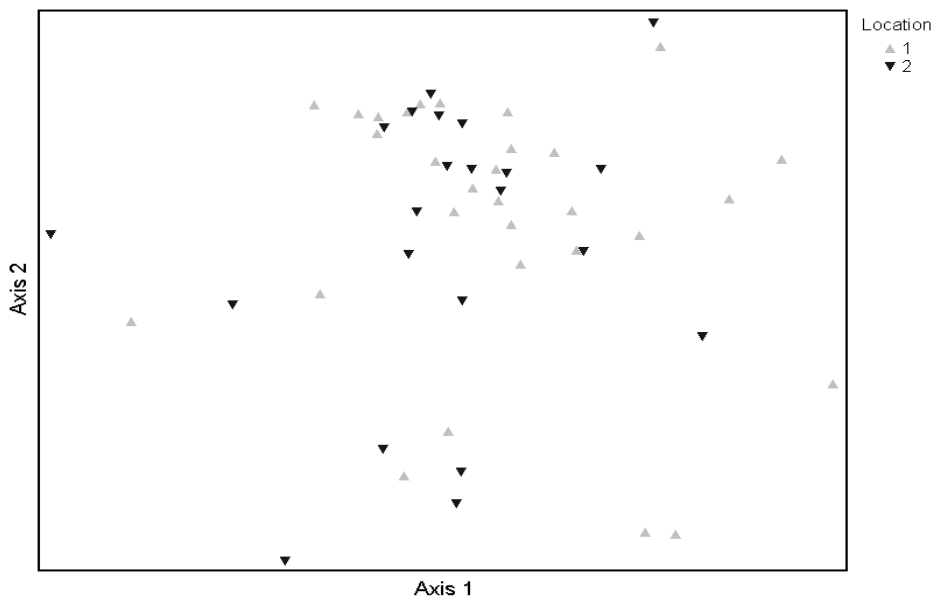


Figure 5. Pre-engagement survey responses show no significant difference in overall environmental attitudes and content knowledge prior to lectures (\blacktriangle) and workshops (\blacktriangledown).

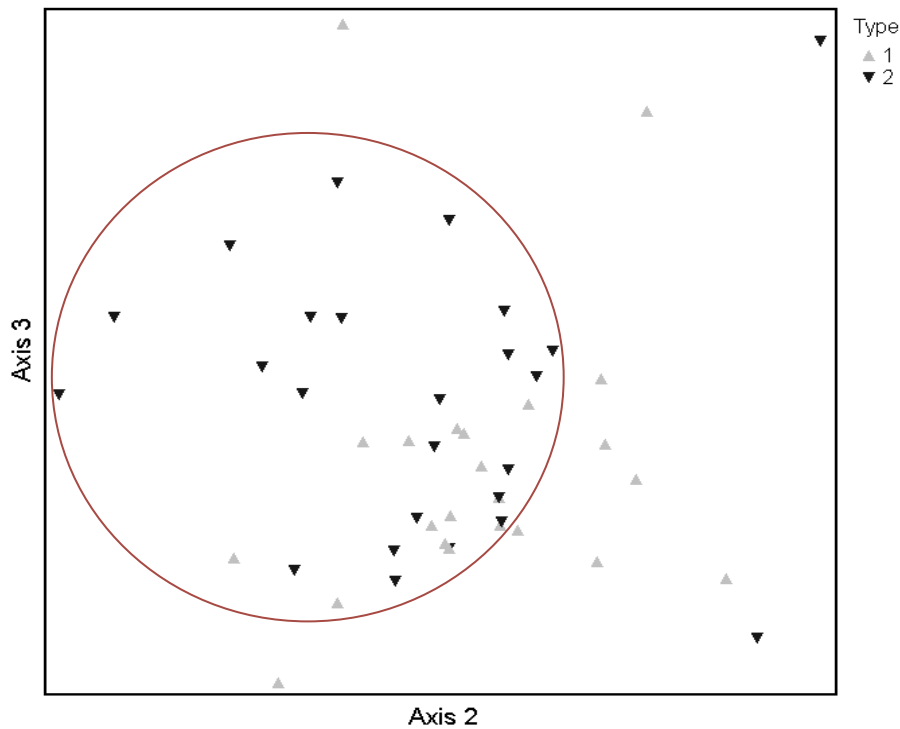


Figure 6. Post-engagement survey responses show a significant difference in overall environmental attitudes and content knowledge following lectures (▲) and workshops (▲).

Another important aspect of this study was the variation in mean improvement scores among specific questions. Mean improvement scores for personal action type questions (1-4) such as: “How likely are you to seek information on the environment?” showed overall lower improvement than questions that were more focused on knowledge gained in the presentation (5-10) such as: “How important is education in terms of conservation efforts?” The lower improvement scores on the personal action questions may be because inmates that choose to come to a science-based lecture already have an interest in nature and environmental practices. There are several interesting differences in

mean improvement in knowledge-based questions, and some differences in improvement when comparing lecture to workshop presentations (Figure 7; a complete list of questions 1-10 can be found in Appendix B). In particular, Question 9 shows a noticeable increase in improvement for lecture respondents compared to workshop respondents. This was a question discussing climate change, and we hypothesize that perhaps a topic such as climate change is more effectively communicated and understood in a more formal setting such as a lecture.

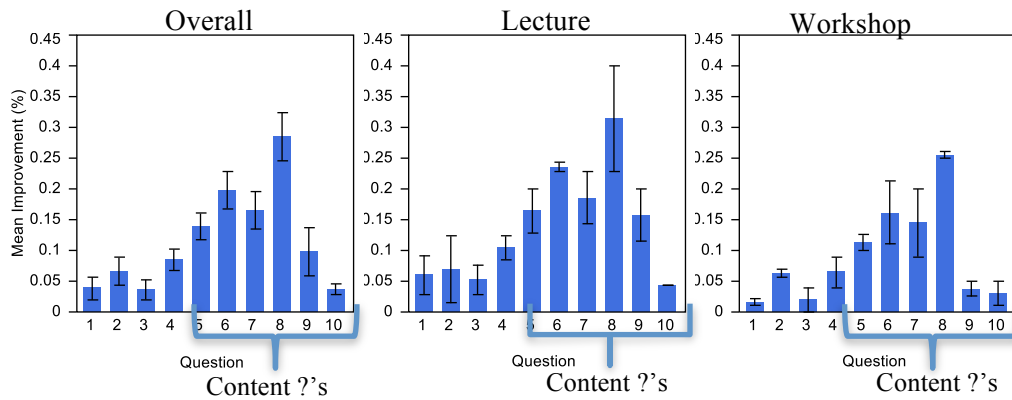


Figure 7. Mean percent improvement by question overall, for lecture respondents and for workshop respondents. Values represent means +/- 1 standard error. Questions 1-4 represent action items, and questions 5-10 represent content questions.

To verify whether content was presented equally throughout the lecture-style and workshop-style presentations, we chose words that we hoped to see in response to the open-ended questions included on the post-surveys. Chosen words were: learn, environment, interest, and conservation. We tallied the number of times we saw these words from participants in the lecture-style and workshop-style presentations, and found the final numbers were very similar. From this we

deduced the communication of content remained consistent throughout the presentations.

	Learn(ing)	Environment	Interest(ed)	Conservation
Workshop	14	14	7	2
Lecture	14	12	5	3
Total	28	26	12	5

Table 1. Number of times coded words appeared in open-ended survey questions. Communication of content remained consistent between lecture-style and workshop-style presentations.

Discussion

Initially, we expected that the workshop-style presentations would be more effective than lecture-style; however, results of the data analysis indicated that the lecture-style presentations might be more effective in improving inmate knowledge and attitudes regarding environmental topics than workshop-style presentations. Also contrary to the initial hypothesis, no significant differences in knowledge and attitudes between participating male and female inmates were found. We suspect that participating inmates appreciated the structure of the lecture over the relatively relaxed and engaging environment established in the workshops. In the lecture-style presentation inmates received knowledge from an expert on the topic, rather than engaging in discussion with their peers, as they were encouraged to do in the workshop-style presentation. This is an interesting contrast to science education with high school and college students where engagement is typically better and learning is enhanced in hands-on environments (Duerden & Witt, 2010). It is possible that incarcerated students respond

positively to authoritative figures in the sciences and are less willing to judge fellow inmates as knowledgeable in science and sustainability fields.

Duerden and Witt (2010) studied the impact of direct (experiential learning) and indirect (lecture-based learning) experiences on the development of environmental knowledge, attitudes, and behavior. They point out a problem within EE that practitioners disagree on the most effective methods to promote pro-environmental behavior; a major part of the issue is whether to promote affective (i.e., attitudes and values) or cognitive (i.e., knowledge) learning (Duerden & Witt, 2010, p. 378).

In their study, Duerden and Witt (2010) examined a program offering three stages: a preparatory program, an international field workshop, and a post-trip service project (p. 382). The preparatory program was classroom-based, the field workshop experiential, and the post-service project designed and implemented by the students upon their return from the field workshop. They found that though the direct and indirect learning experiences were different, individuals experienced similar levels of growth on both environmental knowledge and environmental attitude, and both of these variables had comparable connections to environmental behavior (Duerden & Witt, 2010, p. 389).

These results conflict with findings from experiments conducted by Fazio and Zanna (1978, 1981) on the impact of direct and indirect experiences on attitude-behavior consistency. They found that direct experiences produce attitudes more likely to lead to behavior change, while indirect experiences are

not as likely to produce attitudes leading to behavior change (as cited in Duerden & Witt, 2010, p. 381). A study conducted by Dettman-Easler and Pease (1999) also found that students involved in a direct EE program developed significantly more positive attitudes and retained those attitudes up to three months after the program (p. 1). Conversely, a meta-analysis conducted by Zelezny (1999) suggests that classroom-based (indirect) programs more effectively influenced environmental behavior (as cited in Duerden & Witt, 2010, p. 380-381).

Clearly there are conflicting ideas amongst EE professionals as to what makes an environmental learning opportunity or program successful. If attitude is a direct influence upon behavior, then changing and creating positive attitudes towards the environment and environmental activities is of utmost importance, as those attitudes will eventually change behavior. Programs that touch on both direct and indirect learning might offer a more robust, meaningful experience to learners allowing them to ascertain knowledge, experience positive attitudes towards the environment and hopefully change behaviors to the benefit of the environment.

Because the inmates that participated in the learning opportunities presented in this study seemed to appreciate the indirect, classroom-based environmental lecture over the direct workshop-style presentation, one could argue that their attitudes were positively influenced by the indirect experience more than their potential environmental behaviors were changed. However, if attitude directly influences behavior, then the participating inmates may eventually alter their behavior to the benefit of the environment. Depending upon

the goal of each EE program (positive attitude or behavior change), the learning opportunity might be structured to focus on the end goal, and the indirect or direct classroom style chosen to promote those interests.

A question posed on the post-engagement survey of this study asked participating inmates, “Does the content presented inspire interest and/or action towards environmental stewardship?” Of 53 total responses, 45 said that yes, they were inspired towards environmental stewardship. Eighty-five percent is a significant percentage of individuals that received the educational opportunity and felt moved to action afterwards. This is encouraging from many viewpoints: 1) the SPP is clearly reaching people and peaking their interests; 2) the DOC benefits from positive behavior when inmates are focused on an outside interest; and, 3) society may receive the double benefit of keeping an inmate out of prison upon release, as well as benefit from another individual interested in and dedicated to caring for our natural environment in whatever capacity they are able.

Variation between the presentations was controlled to the best of the instructors’ ability; however, different environments within the prisons create different dynamics amongst the inmates, staff, and presenters that could not be controlled for. The instructors also controlled both lecture and workshop-style presentations for time in an effort to present content as equally as possible. This may have caused more convergence between the presentations than anticipated possibly taking away from the workshop-style experience for participating

inmates. Future studies should explore the possibility of not controlling for time to allow for more in-depth discussion during a workshop-style presentation.

Another important limitation to note is the inherent biases of the study. We recognize that in participating as presenter and in conducting the data analysis, the authors could have an unintentional bias to the analysis and therefore the conclusions in this study. Also, though we intentionally chose CCCC and MCCCW as the facilities in which to present and gather data, their exposure to SPP programs might bias the study, though in which direction we are not sure.

The presentations conducted in this study focused solely on issues surrounding the endangered Oregon spotted frog. CCCC has had lectures on OSF in the past, which could have kept inmates from attending the presentation, or brought in inmates who already had a wealth of knowledge on the subject. If the SPP is able to repeat this study, it would be interesting to see results after the presentation of different topics; particularly ones the inmates have not been exposed to. However, finding presenters willing and able to commit their time to presentations in prisons is always difficult. This reality poses a challenge to conducting studies such as this one in the future.

The Sustainability in Prisons Project currently focuses primarily on lecture-style presentations with an occasional opportunity for hands-on or outdoor workshops. Based on the results of this research project, we recommend that the SPP continue their educational offerings in prisons, with a focus on lecture-style presentations. We would also encourage the SPP to conduct a similar study to this one with a larger sample size and a greater number of participating prison

facilities. This study was relatively weak statistically and future studies would benefit from a more robust sample size. For example, in Figure 4 we see a trend that shows survey responses may improve more dramatically following a lecture than a workshop, and with a larger sample size it is possible that we would see statistical significance to support this trend. It would also be interesting to examine the demographics, age, and education level of participating inmates alongside their survey results to obtain a more specific analysis of the individual as well as the group as a whole.

This research project could influence how the SPP presents educational opportunities in prisons for incarcerated men and women in Washington State. Refined teaching methods may help the SPP reduce recidivism rates through informing inmates of various environmental, educational and green collar job opportunities. This lecture and workshop series contributes to a connection between incarcerated individuals, the scientific community, Washington Department of Fish and Wildlife, students at The Evergreen State College, and Washington State Department of Corrections. This research might also contribute to the literature regarding environmental education in the prison education system, as well as to the discussion of which teaching methods work best with a variety of adult learners.

Conclusion

Conclusion

Though few EE opportunities exist in prisons to-date, the SPP and proven public interest through media attention, is providing evidence that a desire and a need

exist for such opportunities for inmates and for correctional facilities as a whole. The SPP is able to reach demographics that are often underrepresented in the scientific community. They are able to introduce those who have limited educational backgrounds to scientific ideas and in some cases engage them in on-site conservation projects (raising plants, frogs, and butterflies). Ulrich and Nadkarni (2008) comment on the astonishment of corrections center staff at the energy, interest, and patience incarcerated participants exhibited in caring for moss. Caring for a non-showy, slow-growing organism such as moss can prove challenging and tedious particularly to individuals lacking formal education and coming from diverse backgrounds that do not include nature study (Ulrich & Nadkarni, 2008). Teaching participants, empowering them to explore ways to solve a critical environmental problem, and enabling them with a real sense of ownership allowed participating individuals to feel dedicated to the task, and successful in their achievements (Ulrich & Nadkarni, 2008). Another important consideration is that the cost of higher education in many states competes with funds that must be allocated to manage inmates, and prisons house an increasing population of stable and “teachable” men and women (Ulrich & Nadkarni, 2008). This creates a valuable opportunity for outreach to prison communities that do not receive much in the way of science and nature exposure. Most of the inmates incarcerated in America today will have an opportunity to create a life outside of prison. With the influence of EE opportunities, they could have increased knowledge and experience enabling them to be environmental stewards, a benefit for both society and the environment.

Chapter 3

Research Recommendations

This study was designed with two research questions in mind: 1) are lectures or workshops more effective in improving inmate knowledge and attitudes regarding environmental topics?, and 2) does a difference exist in teaching and learning needs between male and female inmates? I expected that the workshop-style presentations would be more effective than lecture-style; however, results of the data analysis indicated that the lecture-style presentations might be more effective in improving inmate knowledge and attitudes regarding environmental topics than workshop-style presentations. I also found no significant difference in the learning needs between participating male and female inmates. I suspect that participating inmates appreciated the structure of the lecture over the relatively relaxed and engaging environment established in the workshops. In the lecture-style presentation they were receiving knowledge from an expert on the topic, rather than engaging in discussion with their peers as they are encouraged to do in a workshop-style presentation. This is an interesting contrast to science education with high school and college students where engagement is typically better and learning is enhanced in hands-on environments (Duerden & Witt, 2010). It is possible that incarcerated students respond better to authoritative figures in the sciences and are less willing to judge fellow inmates as knowledgeable in science and sustainability fields.

The Sustainability in Prisons Project (SPP) currently uses primarily lecture-style presentations with an occasional opportunity for hands-on or outdoor

workshops. Given the results of my preliminary study, I would recommend that the SPP continue their educational offerings in prisons, with a focus on the lecture-style presentations. Nevertheless I recognize that the limited number of presentations, EE topics and incarcerated participants in my study would suggest that further research needs to be undertaken. To that end, I would encourage the SPP to conduct a similar study to this one with a larger sample size and a greater number of participating prison facilities. It would also be interesting to examine the demographics, age, and education level of participating inmates alongside their survey results to obtain a more specific analysis of the individuals as well as the group as a whole.

Another interesting approach would be to delve deeper into the qualitative research and analysis of an EE program in prisons. Though inmates are protected under HSR guidelines, there is qualitative data that can be gathered from participating inmates. Conducting interviews before and after EE presentations might reveal opportunities for improvement of EE in prisons as well as individual desires for future EE programs. Conducting ethnographic research might allow for a deeper understanding of the role of education and EE in particular within prison populations. There are a number of qualitative methods that would make an interesting and robust study of prison populations, unfortunately they were outside the scope of my research project, but I would recommend further research in this area to the SPP.

Study Limitations

A number of limitations on research exist when working within prison systems and in conducting this study I confronted many of them. For a variety of reasons, inmates may miss notification of opportunities presented for them or they may be engaged in rehabilitation, classes, or jobs, depleting the number of potential attendees at presentations. Human Subjects Review guidelines protect the personal information of inmates therefore limiting the scope of questions a researcher is allowed to ask. Surveys presented to the inmates in this project focused only on knowledge gained during the offered educational opportunity. Knowing the educational background, level of interest in the topic, as well as demographic information of participating inmates would have been an interesting component of the research, but was beyond the scope of this thesis project.

Variation between the presentations was controlled to the best of the instructors' ability; however, different environments within the prisons create different dynamics amongst the inmates, staff, and presenters that could not be controlled for. The instructors also controlled both lecture and workshop-style presentations for time in an effort to present content as equally as possible. This may have caused more convergence between the presentations than anticipated possibly taking away from the workshop-style experience for participating inmates. Future studies should explore the possibility of not controlling for time to allow for more in-depth discussion during a workshop-style presentation.

Another important limitation to note is the inherent biases of the study. First, as one of the presenters as well as the one who conducted the data analysis,

there could be an unintentional bias to the analysis and therefore my conclusions in this study. Also, though we intentionally chose CCCC and MCCCW as the facilities in which to present and gather data, their exposure to SPP programs might bias the study, though in which direction I am not sure. Would interest be greater because there are endangered Oregon spotted frogs being raised at CCCC and endangered Taylor's Checkerspot butterflies at MCCCW? Or would inmates feel that they have been exposed to these topics and know all they care to know, thus keeping them from the presentations?

As Mageehon, 2006 pointed out in her study, a student's previous academic experience can determine their willingness or trepidation in pursuing academic opportunities. The SPP works within a very academic model that could be welcoming to some and alienating to others. If an inmate is unsure of their capacity to understand scientific concepts or feels that the presentation will be too academic, they may choose not to attend lectures and not to engage with the SPP in the future. How to reach these individuals and encourage their participation is an interesting question.

The presentations conducted in this study focused solely on issues surrounding the endangered Oregon spotted frog. CCCC has had lectures on OSF in the past, which could have kept inmates from attending the presentation, or brought in inmates who already had a wealth of knowledge on the subject. If the SPP is able to repeat this study, it would be interesting to see results after the presentation of different topics; particularly ones the inmates have not been exposed to. However, finding presenters willing and able to commit their time to

presentations in prisons is difficult. This reality poses a challenge to conducting studies such as this one in the future.

Interdisciplinary Nature of the Study

This thesis project reflects the interdisciplinary nature of The Evergreen State College Masters of Environmental Studies Program in that it crossed boundaries between academic disciplines and engaged students, professors, and professional researchers in pursuit of a common goal. In order to complete this thesis project I received education across the disciplines of Ecology, Conservation Biology, Herpetology, Environmental Justice, Social Justice, Environmental Policy, Environmental Education, Multivariate Statistics, and qualitative and quantitative research methods.

Creating the Environmental Education presentations offered at CCCC and MCCCW involved collaboration between Washington State Department of Fish and Wildlife Senior Research Scientist Marc Hayes, Sustainability in Prisons Project Co-Director and Member of the Faculty at The Evergreen State College Carri LeRoy, and Graduate Student at The Evergreen State College Sarah Weber. The chosen topic focused on the endangered Oregon spotted frog (OSF), its biology, the multitude and magnitude of policies surrounding its survival, and the ecological and biological steps being taken to augment populations in the Puget Sound region. We combined the academic disciplines Ecology, Biology, Conservation Biology, Policy, and Education to create a thorough perspective of the chosen topic.

In order to execute the presentations in the chosen prison facilities we worked closely with the Sustainability in Prisons Project (SPP) and the Washington State Department of Corrections (WSDOC). Surveys were created with the authorization and approval of both the SPP and WSDOC and under the SPP's Human Subjects Review with the Washington Department of Health and Social Services. This collaboration between the sciences, a community organization, and state departments led to the educational engagement of incarcerated men and women in two prisons in Washington State. With the administered surveys we know the educational impacts of these presentations on the inmates, but we do not know the longer-term impacts of the experience. Hopefully the inmates that chose to participate in the presentations will have the interest to pursue future Environmental Education opportunities within the prisons as well as outside of the prisons upon their release.

The interdisciplinary research, planning and collaboration involved with this thesis project was intensive and rewarding, resulting in the synthesis of several academic disciplines and individual perspectives and knowledge. When it comes to education in prison systems, interdisciplinary methods may be exactly what is needed. Inmates come from a plethora of diverse backgrounds, some with extensive education and some with very little. The combination of disciplines and the subsequent conversations involved amongst professionals may help in disseminating information and education to prison populations.

Broader Impacts

In conducting my literature review, I found very little in the way of EE activities taking place within the prison system. Environmental adult education in prisons may help inmates make the connection to educational and employment opportunities upon release. The SPP is one organization working to bring science into prisons and educate inmates about ongoing conservation and sustainability projects both within and outside prisons. This research project could influence how the SPP presents educational opportunities in prisons for incarcerated men and women in Washington State. Refined teaching methods may help the SPP reduce recidivism rates through informing inmates of various environmental, educational and green collar job opportunities.

Inmates in the selected minimum-security prisons used in this research project will be released within five years, making them an important audience to reach for possible career opportunities. Instruction offered to the inmates combined policy and science through discussion of the endangered Oregon spotted frog (OSF), the multiple causes of its population decline, the involved political processes, and the steps being taken to augment the OSF population in the Puget Sound region. This lecture and workshop series contributes to connections among incarcerated individuals, the scientific community, Washington Department of Fish and Wildlife, students at The Evergreen State College and Washington State Department of Corrections. This thesis project will contribute to the literature regarding environmental education in the prison

education system and the discussion of whether one teaching method is more effective than others for inmate populations.

Conducting EAE in correctional facilities is a unique opportunity to connect minorities to science education. Many minorities in correctional facilities come from low-income backgrounds where neighborhood schools do not have the resources for extra-curricular classes such as EE. Students in these situations often have limited exposure to nature, and scientific pursuits such as ecology for example, are often reduced to textbook definitions rather than explanations and demonstrations communicating their vast meanings and limitless possibilities. Such great concepts need in-depth discussion and illustration and the SPP is able to offer such knowledge and opportunity to underserved populations.

Though ironic to imagine an individual receiving exposure to nature once they are inside prison walls, the SPP makes that possible. Inmates receive transformative educational opportunities and exposure to science that they may not have received outside of prison. The SPP is a young organization so few incarcerated individuals engaged with SPP programs have been released; however, of the individuals that have, some are pursuing scientific and EE interests in an attempt to stay out of prison. Mr. Ulrich worked on raising moss in prison with Dr. Nadkarni, was first author on a peer-reviewed paper, and is currently pursuing a PhD in biochemistry at the University of Nevada, Reno. Mr. Travatte was introduced to beekeeping at CCCC and started raising his own bees after his release. He credits the bees and the money he can make from beeswax balms and creams for keeping him from returning to prison. Most recently, Ms.

Landa, is working as a technician raising Taylor's checkerspot butterflies at MCCCW. After her experience with SPP she is committed to going back to school. Not every story will be a successful one, but exposure and awareness of EE opportunities inside and outside of prisons may offer hope and purpose to incarcerated individuals upon release.

A question posed on the post-engagement survey of this study asked participating inmates, "Does the content presented inspire interest and/or action towards environmental stewardship?" Of 53 total responses, 45 said that yes, they were inspired towards environmental stewardship. Eighty-five percent is a significant percentage of individuals that received the educational opportunity and felt moved to action afterwards. This is encouraging from many viewpoints: 1) the SPP is clearly reaching people and peaking their interests. 2) the DOC benefits from positive behavior when inmates are focused on an outside interest and 3) society may receive the double benefit of keeping an inmate out of prison upon release, as well as benefit from another individual interested in and dedicated to caring for our natural environment in whatever capacity they are able.

Conclusion

Though few EAE opportunities exist in prisons to-date, the SPP and proven public interest through media attention, is providing evidence that a desire and a need exist for such opportunities for inmates and for correctional facilities as a whole. The SPP is able to reach demographics that are often underrepresented in the scientific community. They are able to introduce those who have limited

educational backgrounds to scientific ideas and in some cases engage them in on-site conservation projects (raising plants, frogs, and butterflies). Ulrich and Nadkarni (2008) comment on the astonishment of corrections center staff at the energy, interest, and patience incarcerated participants exhibited in caring for moss. Caring for a non-showy, slow-growing organism such as moss can prove challenging and tedious, particularly to individuals lacking formal education and coming from diverse backgrounds that do not include nature study (Ulrich & Nadkarni, 2008). Teaching participants, empowering them to explore ways to solve a critical environmental problem and enabling them with a real sense of ownership allowed participating individuals to feel dedicated to the task and successful in their achievements (Ulrich & Nadkarni, 2008). Another important consideration is that the cost of higher education competes in many states with funds that must be allocated to manage offenders and prisons house an increasing population of stable and “teachable” men and women (Ulrich & Nadkarni, 2008). This creates a valuable opportunity for outreach to prison communities that do not receive much in the way of science and nature exposure. Most of the inmates incarcerated in America today will have an opportunity to create a life outside of prison. With the influence of EE opportunities, they could have increased knowledge and experience enabling them to be environmental stewards, a benefit for both society and the environment.

References

Ashland University (2012). Journal of Correctional Education. Retrieved June 25, 2012, from www.ashland.edu/professionals/locations/gill-center-business-economic-education/journal-correctional-education

Bayliss, P. (2003). Learning behind bars: time to liberate prison education. *Studies in the Education of Adults*, 35(2), 157-172.

Bush-Gibson, B., Rinfret, S. R. (2010). Environmental Adult Learning and Transformation in Formal and Nonformal Settings. *Journal of Transformative Education*, 8(2), 71-88.

Clover, D.E. (2003). Global Perspectives in Environmental Adult Education. New York, Bern, Bruxelles: Peter Lang – International Academic Publishers.

Cnaan, R.A., Draine, J., Frazier, B. Sinha, J. W. (2008) Ex-prisoners' re-entry: An emerging frontier and a social work challenge. *Journal of Policy Practice*, 7(2-3), 178-198.

Deaton, C. (2005). Humanizing Prisons with Animals: A Closer Look at “Cell Dogs” and Horse Programs in Correctional Institutions. *Journal of Correctional Education*, 56(1), 46-62.

- Diseth, A., Eikeland, O., Manger, T., Hetland, H. (2008). Education of prison inmates: course experience, motivation, and learning strategies as indicators of evaluation. *Educational Research and Evaluation*, 14(3), 201-214.
- Duerden, M.D., Witt, P.A. (2010). The impact of direct and indirect experiences on the development of environmental knowledge, attitudes, and behavior. *Journal of Environmental Psychology*, 30, 379-392.
- Duguid, S., Hawkey, C., Pawson, R. (1996). Using recidivism to Evaluate Effectiveness in Prison Education Programs. *Journal of Correctional Education*, 47(2), 74-85.
- Evans, M. (2010). Recidivism Revisited. Washington State Department of Corrections, 1-8.
- Falk, J. H., Heimlich, J. E., and Bronnenkant, K. (2008). Using Identity-Related Visit Motivations as a Tool for Understanding Adult Zoo and Aquarium Visitors' Meaning-Making. *Curator*, 51(1), 55-80.
- Haugen, C.S. (2006) Environmental Adult Educator Training: Suggestions for effective practice. *Convergence*, 39(4), 91-106.
- Hall, R.S., Kilacky, J. (2008). Correctional education from the perspective of the prisoner

student. *Journal of Correctional Education*, 59(4), 301-320.

Heimlich, J.E., Horr, E.E.T. (2010). Adult Learning in Free-Choice Environmental Settings: What Makes It Different? *New directions for adult and continuing educations*. 127, 57-66.

Hungerford, H., Volk, T. (1990). Changing Learner Behavior through Environmental Education. Article prepared for the World Conference on Education for all – Meeting Basic Learning Needs. 257-270 International Centre for Prison Studies (2012). World Prison Brief. Retrieved May 28, 2012, from www.prisonstudies.org/info/worldbrief/wpb_country.php?country=190.

Lord, T. R. (1999). A Comparison Between Traditional and Constructivist Teaching in Environmental Science. *Journal of Environmental Education*, 30(3) 22.

Mageehon, A, (2003), Incarcerated women s educational experiences. *The Journal of Correctionai Education*, 54(4), 191-199.

Mageehon, A. (2006). What makes a “good” teacher “good”: Women in transition from prison to community reflect. *Journal of Correctional Education*, 57(2), 145-157.

Newman, A.P., Lewis, W. and Beverstock, C. (1993), *Prison Literacy*. Philadelphia: National Center of Adult Literacy.

Parkinson, A., Steurer, S. (2004). Overcoming the Obstacles in Effective Correctional Instruction. *Journal of Corrections Today*, 66(2), 88-91.

Rose, J.E., Voss, M. (2003). The unity in community: Fostering academic success among diverse communities of male offenders in correctional institutions. *Journal of Correctional Education*, 54(4), 131-159.

Schmitt, J., Warner, K., Gupta, K. (2010). The High Budgetary Cost of Incarceration. Center for Economic and Policy Research, 1-19.

Stapp, W., Bennet, D., Bryant W., Fulton, J., MacGregor, J., Nowak, P., Swan, J., Wall, R., Havlick, S. (1969). The Concept of Environmental Education. *Journal of Environmental Education*, 1(1), 30-36.

Steurer, J., Smith, L. (2001). Education Reduces Crime: Three-State Recidivism Study. Executive Summary. Correctional Education Association. 1-20.

Storksdieck, M., Ellenbogen, K., & Heimlich, J. E. (2005). Changing minds? Reassessing outcomes in free-choice environmental education. *Environmental Education Research*, 11, 353–369.

Sustainable Prisons Project (2012). About Us: Mission. Retrieved May 5, 2012, from blogs.evergreen.edu/sustainableprisons/about.

Taylor, E. W., Neill, A. C. (2008) Museum Education: A Nonformal Education Perspective. *Journal of Museum Education*, 33(1), 23-32.

Tootoonchi, A. (1993). College Education in Prisons: The Inmates' Perspective. *HeinOnline*, 57. Retrieved from <http://www.heinonline.org>

Ulrich, C., Nadkarni, N. (2008). Sustainability Research and Practices in Enforced Residential Institutions: Collaborations of Ecologists and Prisoners. *Environment, Development, and Sustainability*, 11(4), 815-832.

Vacca, J. (2004). Educated prisoners are less likely to return to prison. *Journal of Correctional Education*, 55(4), 297-305.

Vella, J. (2001). *Taking Learning to Task: Creative Strategies for Teaching Adults*. San Francisco: Jossey-Bass.

Vella, J. (2002). *Learning to Listen, Learning to Teach: The power of Dialogue in Educating Adults*. Revised edition. San Francisco: Jossey-Bass.

Walter, P. (2009). Philosophies of adult environmental education. *Adult Education Quarterly*, 60(1), 3-25

Winters, C.A. (2000). Promising practices in adult correctional education. *Journal of Correctional Education*, 51(4), 312-314.

Zeppel, H. (2008). Education and conservation benefits of marine wildlife tours: Developing free-choice learning experiences. *Journal of Environmental Education*, 39(3), 3-17.

Appendix A

Extended Methods

In April 2012, Washington Department of Fish & Wildlife Senior Research Scientist Marc Hayes and I presented lectures and workshops at two minimum-security prisons in Washington State. The two prisons were: Mission Creek Corrections Center for Women (MCCCW) in Belfair, WA. and Cedar Creek Corrections Center for Men (CCCC) in Littlerock, WA. Both MCCCW and CCCC were selected because they are prisons in which the SPP has implemented conservation projects, and because they house individuals who will be released within 5 years. Because of the interest created by SPP, we knew that at each prison we would have some attendees who were involved with or exposed to the conservation projects within those facilities, and some that were not. We also felt that, due to their imminent release, our students may include inmates seeking educational opportunities that could influence their direction and choices once outside of the prison system.

Both prisons are work camp-style prisons and inmates have jobs they perform either on or off grounds. If they are not working, then they are in educational, social, or rehabilitative classes. These conflicts made scheduling educational opportunities difficult, as we wanted to offer presentations at a time when we would have the most attendees. In order to create interest in the presentations, an informative flyer was posted throughout each prison inviting inmates to attend and to sign up with their counselor for one of the presentation times. Inmates were not aware that there would be different presentation styles;

they simply chose based upon which time slot they preferred. The captain at the men's prison wanted to make sure attendees were present, so he included on the flyer that refreshments would be provided and a tray of cookies was offered at each presentation at CCCC. Given that the presentations were in conflict with rest time, recreation time, and in the case of MCCCW, with other classes, our attendance numbers were not as high as we might have hoped. At MCCCW, we had 10 attendees at the workshop presentation and 13 at the lecture. At CCCC, we had 16 attendees at the workshop presentation and 14 at the lecture, for a total of 53 participants.

In an attempt to control for the differences in presentation times during the day and evening, inmate attention spans as determined by time of day, and our own possible presentation strengths and weaknesses based upon time of day, Dr. Hayes and I decided to randomly choose the first presentation style and assign the following three presentations accordingly. We flipped a coin to determine that the first presentation at MCCCW would be a workshop-style presentation, and the second presentation would be lecture-style. At CCCC we switched the order and presented the lecture first, and the workshop second. At both prisons, presentations were given in the facility's visiting room which are large rooms set up for inmates to visit with family and friends, with vending machines for snacks and beverages, and reading corners for children. The rooms have many small tables that seat 4-6 individuals each. At each prison we chose tables close to the front of the room where the presentation was given to combat the background hum of the machines and to encourage inmates to sit at tables together.

Each educational session lasted 2 hours including the time it took for inmates to complete pre- and post-engagement surveys. Presented material focused on the endangered Oregon spotted frog (OSF), the multiple causes of its population decline, the involved political processes and the steps being taken to augment the OSF population in the Puget Sound region. The lecture-style presentation was 90 minutes long utilizing PowerPoint, with 15 minutes set aside for questions at the end. The workshop was set up in the same time frame and also utilized PowerPoint to present some of the same slides as the lecture. However, throughout the workshop, hard copies of slides used in the lecture PowerPoint were passed out so that groups of 4 or 5 inmates could look at a handout together. Leading questions were asked about the content of each handout to facilitate conversation among inmates and between inmates and presenters. During the lecture inmates sat together but faced the presenter, whereas during the workshop, inmates faced the presenter at times and at other times huddled their chairs around the table to look at the handouts together. In both presentation types, significant interaction existed amongst the inmates, though it felt more focused and purposeful during the workshops.

Operating under the SPPs Human Subjects Review with the Washington Department of Health and Social Services, I created pre- and post-engagement surveys using a five-point Likert scale, an attitudinal scale developed by psychologist Rensis Likert (1932). The surveys measure whether inmates gain improved knowledge and attitudes towards the environmental topic after receiving instruction via lecture presentation or workshop presentation. The

surveys consisted of both quantitative and qualitative questions, some of which were repetitive from pre- to post-engagement surveys to see if answers changed after receiving the presentation. Pre-engagement surveys were assigned a number that each participant wrote down to remember, and they recorded that same number on their post-survey for ease of comparison. The surveys were developed utilizing a template provided by the SPP, and tailored to suit my topic and areas of interest. Once finalized, the surveys were approved by SPP Co-Director Carri LeRoy, SPP Project Manager Kelli Bush and Research Manager for Washington Department of Corrections Teri Herold-Prayer. They were then submitted to both MCCCW and CCCC for their approval before giving them to inmates at the presentations.

Appendix B

Surveys

PRE SURVEY

In Order of Importance to You: please rank the following 1-5 (1 = most important, 5 = least important)

I am in this workshop because:

- It gives me something to do
- I go to as many lectures as I can
- I enjoy hearing about the environment
- Conservation education is important
- I think it is important to learn as much as I can while in prison

Your Opinions about the Environment. We would like to know about attitudes towards the environment before you attend the lectures. Please circle one number for how you feel about each statement before the lectures.

Rate your level of agreement with the statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
What I do in my life does not impact the health of natural habitats, those places in nature that are home to plants and animals.	1	2	3	4	5
The world would not suffer if some species, like the Oregon spotted frog, were eliminated.	1	2	3	4	5
The world would not suffer if some wildlife habitats, like marshlands, were eliminated.	1	2	3	4	5
Conservation of species and habitats is an important practice.	1	2	3	4	5
Without human intervention many species would become extinct.	1	2	3	4	5

How likely are you to...	Very unlikely	Unlikely	Neutral	Likely	Very Likely
Seek information on the environment?	1	2	3	4	5
Seek information about amphibians and conservation?	1	2	3	4	5
Talk to others about issues related to the environment?	1	2	3	4	5
Talk to others about amphibians and conservation?	1	2	3	4	5

Your opinion. Please circle one number for each statement.

	Strongly Disagree ☹	Disagree	Agree	Strongly Agree ☺	Don't Know -?-
1. Because amphibians are sensitive to their environment, they can warn humans of disease outbreak, pollution, and other environmental issues.	1	2	3	4	0
2. The Oregon spotted frog is an important species to protect.	1	2	3	4	0
3. Political protection of the Oregon spotted frog is complicated but worth the effort if the species and its habitat is protected in the future.	1	2	3	4	0
4. The most devastating environmental impact on the Oregon spotted frog is competition with exotic and invasive species.	1	2	3	4	0
5. Climate change has the potential to create negative impacts on a scale much greater than what we have seen historically.	1	2	3	4	0
6. Education is the most important part of conservation work.	1	2	3	4	0

POST SURVEY

Your Opinions about the Environment. We would like to know about your attitudes towards the environment now that you have attended the lecture/workshop. Please circle one number for how you feel about each statement after the lectures.

Rate your level of agreement with the statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
What I do in my life does not impact the health of natural habitats, those places in nature that are home to plants and animals.	1	2	3	4	5
The world would not suffer if some species, like the Oregon spotted frog, were eliminated.	1	2	3	4	5
The world would not suffer if some wildlife habitats, like marshlands, were eliminated.	1	2	3	4	5
Conservation of species and habitats is an important practice.	1	2	3	4	5
Without human intervention many species would become extinct.	1	2	3	4	5

Your opinion. Please circle one number for each statement.

	Strongly Disagree ☹	Disagree	Agree	Strongly Agree ☺	Don't Know -?-
1. Because amphibians are sensitive to their environment, they can warn humans of disease outbreak, pollution, and other environmental issues.	1	2	3	4	0
2. The Oregon spotted frog is an important species to protect.	1	2	3	4	0
3. Political protection of the Oregon spotted frog is complicated but worth the effort if the species and its habitat are protected in the future.	1	2	3	4	0
4. The most devastating environmental impact on the Oregon spotted frog is competition with exotic and invasive species.	1	2	3	4	0
5. Climate change has the potential to create negative effects on a scale much greater than what we have seen historically.	1	2	3	4	0

6. Education is the most important part of conservation efforts.	1	2	3	4	0
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How likely are you to...	Very unlikely	Unlikely	Neutral	Likely	Very Likely
Seek information on the environment?	1	2	3	4	5
Seek information about amphibians and conservation?	1	2	3	4	5
Talk to others about issues related to the environment?	1	2	3	4	5
Talk to others about amphibians and conservation?	1	2	3	4	5

Please provide us with your feedback about the lecture.

Please circle one number for each statement.

	Strongly Disagree ☹	Disagree	Neutral ☺	Agree	Strongly Agree ☺
1. The presenter(s) was/were engaging.	1	2	3	4	5
2. I would recommend this lecture to a friend.	1	2	3	4	5
3. I learned about the environment in this lecture.	1	2	3	4	5
4. After this lecture I would like to find more information about the environment.	1	2	3	4	5
5. After this lecture I would like to find more information about conservation practices.	1	2	3	4	5

OPEN-ENDED

Please provide some feedback on the program by answering the following questions.

1. What are some of the reasons you attended this lecture?
2. How, if at all, would you improve this lecture?
3. What (if anything) did you learn from attending this lecture?
4. Does the content presented inspire interest and/or action towards environmental stewardship?