

THE INSTRUCTIONAL GUIDE FOR EARTH ARTS ACADEMY:
A NEW ALTERNATIVE INTERDISCIPLINARY
ENVIRONMENTAL HIGH SCHOOL MODEL

A Project

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to the Faculty of

California State University, Chico

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in

Education:

Curriculum and Instruction Option

by

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Fall 2015

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Xylem Larla Dey

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APPROVED BY THE INTERIM DEAN OF GRADUATE STUDIES:

Sharon A. Barrios, Ph.D.

APPROVED BY THE GRADUATE ADVISORY COMMITTEE:

Ann K. Schulte, Ph.D.
Graduate Coordinator

Alfred Schademan, Ph.D., Chair

Michael E. Kotar, Ed.D.

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Correspondence regarding this study should be addressed to:

Xylem Larla Dey

Department of Education

California State University, Chico, 95926.

Contact: xylemita@gmail.com

DEDICATION

I would like to dedicate this thesis to all the teens in my life,

to my future children,

to my beloved niece Hailey,

to my spirit nephew Saje,

and to the children I lived with while writing:

Ishaya, Aiyla, Chandra, Kailash, Ashe, Beijah, Clove, Annika, and Amara,

and to all of the children of the world who keep me inspired to create something wonderful –

for the earth they inherit, and to help them share their gifts with the world.

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ABSTRACT

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In this project, the following research questions were investigated to inform the creation of a new environmental high school. First, what are the organizational structures, instructional methods, and assessment approaches used at established alternative high schools? Second, how could the lessons learned from these educational structures be implemented in the generation of a new environmental high school design? While the first question guided the research study conducted at four high schools, the second question guided the construction of the project to create a new environmental high school based on the findings of the research.

Methods of organization and instruction were investigated at four well-established alternative high schools, with the goal to create a new environmental high

school design. Six school practices were researched in this study, three organizational structures and three instructional methods: all-school meetings, faculty advisory mentorship groups, individualized pathways to graduation, service learning projects, professional internships, and wilderness education. The researcher identified high schools where these alternative instruction methods have been in use for at least ten years, and conducted a study at four such schools to determine how these curricular and instructional components are designed and implemented. Through a grounded theory analysis, the researcher determined four themes in practice at the four researched schools: facilitating human relationships, emphasizing participatory discussions, navigating a tension between alternative and traditional educational methods, and developing authentic performance-based assessments. These four themes were used to inform the researcher's educational philosophies developed for this thesis project: the new instructional guide for an interdisciplinary alternative environmental high school in Nevada City, California.

Keywords: environmental education, environmental high school, alternative high school, interdisciplinary, service learning, community service, internships, apprenticeships, faculty advisors, all-school meeting, secondary education, educational reform

CHAPTER I

INTRODUCTION

Background

Once only imaginative fodder for kind-hearted fourth-graders concerned about distant polar bears on dwindling pieces of ice, stories of the Earth in crisis have been front page news for several decades now, heralding the need for change in our relationship to the environment. These stories are a cause of concern for every global citizen: suburban grandmothers and rainforest chiefs, sustainable organic farmers and conservative industrial businessmen alike. Global climate change conferences have cited communities displaced by rising sea levels (Intergovernmental Panel on Climate Change (IPCC, 2014), unprecedented sections of melting polar ice caps (Zwally et al., 2011), massive swaths of once-fertile land subject to desertification throughout the world (Xu, Li, Zhuang, & Pan, 2011), and increased instances of hurricanes and natural disasters in our lifetime (Saylan & Blumstein, 2011). Environmental change has been correlated with large-scale human migrations in Asia and Africa in response to such incidents as tsunamis, flooding, and drought Hendrix & Salehyan, 2012; (Hugo & Bardsley, 2013).

It is not a question of whether the planet is changing; the planet has changed (IPCC, 2014). It stands to reason that the educational system therefore needs to change – fast – to introduce adaptations to our new environment, and that we do not have time to wait for bureaucratic delay (Saylan & Blumstein, 2011). Action has been recommended

to reverse environmental changes before they reach the ecological “tipping point,” the point of no return that pervades scientific predictions across environmental factors: global air quality and temperature, polar ice melt, ocean salinity, tundra melt, desertification, forest health, and depleted crude oil reserves leading to a global economic downturn (Huntington, Goodstein, & Euskirchen, 2012; Stafford, 2010; Lenton, Held, Krieger, Hall, Lucht, Rahmstorf, & Schellnhuber, 2008; Murphy & Hall, 2011). Saylan and Blumstein cite evidence that points toward an impending and unprecedented human population crash based on food and water shortages which, at our current trajectory, is not a question of if, but when the crash will happen. Author David Orr (2005) argues that it is the balance of humanity’s survival on a drastically changed planet that is at stake, not the survival of the earth itself. While the planet will find a balance to survive in some changed form, it is our children’s children who will face the challenge of securing clean food, water, shelter, and air to survive in ecosystems that have been forever changed (Orr, 2012). At this point, for humans to have any effect on reversing, halting, or at least slowing these anthropogenic changes, environmental action can no longer be a political stance nor an optional choice, but rather must become an essential part of living in our time.

If humans are to unite behind global ecological restoration in time to tip the scales for our own survival, environmental education (EE) must now take priority across all boundaries of race, class, generations, nations, and political alliances. Yet, because of the magnitude of deeply rooted cultural patterns that must change if we heed the environmentalists’ call (Orr, 2005), and the potential for students’ grief to paralyze rather than catalyze action (Doherty & Clayton, 2011), the approach to EE must be sensitive,

innovative, and relevant. Studies have shown that an emphasis on the ‘doom and gloom’ of environmental disasters is counter-effective in EE, and an integrated and solution-focused instructional design is imperative to inspire action among young people (Saylan & Blumstein, 2011).

EE theorists conjecture about the cause of EE’s failure to incite broad-scale behavioral change, citing EE’s longstanding absence from the national curriculum altogether, and its continued place at the periphery of the educational system (Bruce, 2011). Bruce referred to Giroux’s (1979) concept of ‘hidden curriculum,’ in which the topics included or excluded from curriculum teach lessons about educators’ implicit beliefs on those topics’ importance – in this case, the lack of EE is a silent declaration of the environment’s unimportance. Orr (1992) asserted that the omission of environmental perspectives from education was indicative of an assumption that environmental issues are ‘solvable problems’ that require top-down management, rather than ‘unsolvable dilemmas,’ which require an informed and engaged citizenship to change patterns of behavior. Both Orr (2005) and Saylan and Blumstein (2011) argued that if technological solutions are to be found, the entire populace must be educated and concerned enough to take action as solutions are revealed about the long-range implications of environmental health on human survival, even if it is temporarily inconvenient to change our habits. However, while awareness of environmental issues and knowledge about environmentally sustainable choices is easily attained, arousing sufficient concern for students to change their habitual behaviors and lifestyles requires more persuasive educators’ efforts to connect awareness with appropriate actions (Saylan & Blumstein, 2011).

What might seem meaningful to educators is not necessarily meaningful to students, because it fails to make a relevant connection to their personal experiences [...] Relevance may be the toughest hurdle environmental education faces in changing behavior. (Saylan & Blumstein, 2011, p.48)

In order to address this need for relevant environmental education, this project investigated two research questions: First, what are the organizational structures, instructional methods, and assessment approaches used at established alternative high schools? Second, how could the lessons learned from these educational structures be implemented in the generation of a new environmental high school design? These questions guided both a literature review and a research study, the results of which informed the generation of the project itself: a new environmental high school pedagogical design.

Certain experiential instruction methods have been shown to successfully motivate students to take continued environmental action in their communities (Riordan & Klein, 2010), such as service learning (Sobel, 2009), apprenticeships with professionals in environmental fields (Synergia Learning Ventures, 2011), and immersion in nature (Louv, 2005). This project has endeavored to study effective practices in these instructional methods through peer-reviewed literature and research at established alternative schools, and then to propose a new pedagogical model utilizing these teaching methods with EE as the central school theme. The school that this project proposes has been designed to further equal opportunities for diverse teenagers on the cusp of choosing careers, encouraging their contributions in the world as environmentally aware and engaged global citizens.

Purpose of the Project

To address the need for solution-focused, relevant, and experiential environmental education at the high school level, the purpose of this project is to create the instructional guide for Earth Arts Academy (Earth Arts), a new interdisciplinary environmental high school model for students in Nevada City, California (see Appendix A). The dendritic pedagogical design proposed here is based on an analysis of peer-reviewed literature as well as original research at four alternative high schools utilizing the proposed educational techniques. The proposed school design incorporates academic training and entrepreneurial mentorship in the context of environmental and social justice programming through service learning projects, apprenticeships in sustainability, artistic presentations, and adventures in nature. Earth Arts is meant to serve the discovery and implementation of broad scale human behavioral changes in respect to society's relationship to the environment, by incorporating professionals in sustainability and environmental science into the education and life paths of interested teenagers who will inherit tomorrow's earth.

Scope of the Project

The project (see Appendix A) is intended to create the philosophical background and instructional framework for starting an alternative environmental high school of variable size and scope depending on the assessed needs and abilities of the community of implementation. The instructional framework of this model is designed to be adaptable to the interests of specific teachers, students, and professionals in the community of the school, and to be flexible enough to be replicable in different

communities with unique needs. While schools do exist that emphasize service learning projects, professional apprenticeships, wilderness education, or technological skills, this project aims to create an integrated, interdisciplinary school model (Paterson, 2010) that integrates all of these instructional methods in service of the goal of environmental education for teenagers.

The creation of this model includes a guiding philosophy emphasizing hands-on education and integrating personal connections with professionals into the fabric of the school day (Sobel, 2009). The school design combines social studies courses aiming for social change (Kumler, 2011), conscious communication skills (Rosenberg, 2003), and all-school decision making (Harmony School, 2011), in service of the aim to foster students' individual learning styles and pathways alongside engagement with their community and their environment (Louv, 2005).

This project will be utilized first to start a school – or school program, depending on the needs of the community – in Nevada City, CA, and it is intended to be a replicable structure for other communities. The intended audience of this project includes parents, administrators, and educators who wish to create new schools to address the need for innovative environmental education. The expected result from this project is the creation of Earth Arts Academy, and potentially additional schools, to meet the needs of today's youth for relevant environmental education in preparation for careers in sustainability and environmental science.

Significance of the Project

A review of the research revealed little to no comprehensive studies on the organizational structures or instructional practices at environmental high schools. The research portion of this project is designed to fill that gap in the research, creating a contribution to the field of environmental education. Further, this project aims to provide a significant new model by combining alternative and environmental school methods with wilderness education techniques and technological assignments. Although there are a significant number of environmental school endeavors in the past decade, many are at the elementary school level and few incorporate both wilderness and technological elements into the same school program.

This project creates an opportunity for professionals to connect with high school students to support local environmental service projects of consequence for the community, and for students to explore pro-environmental behavior and actions. Earth Arts Academy is designed to create pathways for interested high school students to enter sustainability careers and academic study during an age of environmental and economic growth in these fields, while creating alternative educational and career opportunities for students that might not otherwise be thriving in traditional schools. This pedagogical model may be used to generate similar school designs in additional communities, utilizing the philosophies and instructional methods in service of EE or to support other school themes.

On the local level, this project is in response to a request from Nevada City parents to create a new alternative school option for local high school students. The local public high school is reportedly overcrowded, and there is a market for new high schools

in town to relieve the stress of too many students. While there are a small number of charter high schools in the area, these are reported to be limited in their progressive education options for students, and parents are seeking additional options. There are also private local high schools, which are limited in their curricular offerings, prohibitively expensive, or only semester-long programs rather than four-year schools. During the researcher's term in graduate study, a new local charter high school has been formed based on experiential education. When launching the programming described in this project, the researcher will seek to cultivate collaboration with the new local high school, which opened in 2014, proposing a vendor-type relationship for initial pilot programming.

Limitations of the Project

This project proposes the instructional framework for Earth Arts Academy, utilizing instructional methods that allow teachers and students to design courses with the flexibility to pursue community-specific learning opportunities in a variety of ways. To that end, this project will not address the curricular content of the school. Curricular content decisions are intentionally left to future committee members (choosing classes and avenues of study) and teachers and students (choosing content, creating mentorships, and initiating service-learning projects), rather than to the initial school model development. Curricular content is therefore outside the scope of this project. The project also does not address financing, facilities, hiring, or enrollment.

In prior evaluation of the challenges faced by charter schools, the author of this project has determined that limitations imposed by testing requirements have

potentially formidable impacts on charter school curricular innovation. Two prominent reasons for the struggle of charter schools to maintain unique curricular missions include significant financial challenges with heightened operational costs (Huerte & d'Entremont, 2010), and increased standardized testing requirements set up by the No Child Left Behind (NCLB) Act of 2001 (Miron, 2010). Miron (2010) argues that NCLB standardized testing requirements limit the autonomy given to charter schools for curricular experimentation, which affect the schools' student achievement scores, their federal and state funding eligibility, and the fulfillment of their school mission.

Therefore, this project is proposed as an independent school, and the testing and curriculum standardization requirements of charter and public schools are not considered in the design. However, the project model may be adapted at a future time in the required ways to create a charter or public school, or to create a supplemental program administrated as a vendor providing educational opportunities for students in these schools. As the researcher would like to create a tuition-free school, one option would be to adapt the independent school design to fit requirements for a charter school, and apply for a waiver from standardized testing as per the precedent set by the New York Consortium for Performance-Based Assessment. These adaptations are outside the scope of this project. While the researcher was able to analyze data from the four schools researched in the independent study to create recommendations for the instructional guide, there were significant limitations in the researcher's ability to triangulate data to support these conclusions during data analysis. The research study required advance planning to arrange weeklong on-site visits to four high schools, and the

researcher was not able to revisit schools to research themes that had arisen at other schools. Further research recommendations are identified in Chapter 5.

Definition of Terms

Environmental Education (EE)

For the purposes of this paper, the definition used is from the U.S.

Environmental Education Act of 1970 (as cited by the Office of Education, 1970), which defined environmental education as:

Environmental education is an integrated process which deals with man's interrelationship with his natural and man-made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation, technology, and urban and rural planning to the total human environment. Environmental education is a study of the factors influencing ecosystems, mental and physical growth, living and working conditions, decaying cities, and population pressures. Environmental education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and to improve the quality of life. (p. 9)

Alternative Education

At the federal level an alternative school is defined as,

A public elementary/secondary school that addresses needs of students that typically cannot be met in a regular school, provides nontraditional education, serves as an adjunct to a regular school, or falls outside the categories of regular, special, or vocational education. (Sable, Plotts, & Mitchell, 2010, p. C-1)

Wilderness Education

According to James Neill of the Wilderdom wilderness education company, “Wilderness education is a broad term which can be used to refer to educational experiences which are conducted in the wilderness (an outdoor expedition) and/or are

about the wilderness (e.g., an indoor class about the biosystem)” (Neill, 2007). For the purposes of this project, wilderness education is defined as being conducted in and about the wilderness, and this definition is synonymous in this project with the terms ‘outdoor education’ and ‘adventure education.’

Interdisciplinary

This term refers to a view of knowledge and curriculum that intentionally applies methodology and vocabulary from multiple disciplines, emphasizing the relationships between disciplines and utilizing a variety of skills “to address a central theme, issue, problem, topic, or experience” (Jacobs, 1989, p. 14). According to Meeth (1978), “Interdisciplinary programs attempt to integrate the contributions of several disciplines to a problem, issue, or theme from life” (p. 10).

Assessment

According to the American Educational Research Association, (as cited by Reynolds, Livingston, & Wilson, 2009), assessment is “any systematic procedure that can be used to make inferences about the characteristics of people or objects” (p. 3).

Sustainability

A working definition of this term for this thesis is taken from Fritof Capra’s (2005) description of a sustainable community as “one that is able to satisfy its needs and aspirations without diminishing the chances of future generations” (p. xiii). According to the World Conservation Strategy of 1980 (as cited by Dresner, 2002) the term ‘sustainable development’ was defined as “the integration of conservation and development to ensure that all modifications to the planet do indeed secure the survival

and well-being of all people” (p. 33). For this project the term ‘professionals in sustainability’ refers to persons who work in sustainable development.

Service Learning

Service Learning is a form of experiential education that incorporates a component of reflection on the experience, and “seeks to engage students in activities that both combine community service and academic learning” (Furco, 2002 , p. 25). Bristol & Knapp (2010) state that, “Service Learning is a teaching strategy that offers students opportunities to learn both in the classroom and in the wider world” (p. 3). For the purposes of this project service learning will be considered synonymous with place-based education.

Place-based Education

According to Sobel (2009), place-based education is,

The process of using the local community and environment as a starting point to teach concepts in language arts, mathematics, social studies, science, and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students’ appreciation for the natural world, and creates a heightened commitment to serving as active, contributing citizens. (p. 7)

CHAPTER II

REVIEW OF LITERATURE

The review of the literature investigated two research questions that guided the project as a whole: What are the organizational structures, instructional methods, and assessment approaches used at established alternative high schools? Also, how could the lessons learned from these educational structures be implemented in the generation of a new environmental high school design? The literature review addressed the second question first, regarding implementation of educational structures in an environmental education context, and then investigated specific methods of instruction and assessment in EE.

The literature review was focused specifically on these instructional methods, because an extensive search for peer-reviewed literature showed that research into instructional methods at environmental high schools on the whole has proved to be scarce. While there are several existing four-year high schools in the country with a specifically environmental focus, these schools did not grant permission to conduct research at their sites. The research done for this project and the accompanying research-based school proposal marks an important contribution to the discourse of secondary EE. What is present in the body of academic literature is research on the importance of EE, specific methods of instruction that are applicable in EE settings, and adaptations for assessment approaches in EE. The following literature review focused on these topics.

Why Environmental Education

The authors Saylan and Blumstein (2011) have cited a litany of current environmental crises – natural disasters, melting icecaps, oil and radioactive spills among them - and dire predictions for the near future in order to establish the urgency of their message; we need to educate our way out of environmental crisis, and it is time for a new definition of environmental education (EE). Saylan and Blumstein made a strong case for immediate action to reform the definition of environmental education (EE), and to undergo a formidable and system-wide implementation of EE across all disciplines. While Saylan and Blumstein acknowledged that students – and the general public – have not responded well to “doom and gloom” appeals for environmental action, they also emphasized the importance of students understanding with certainty that the straits are dire.

David Orr (2004) similarly argued that it was important to build an ecologically literate constituency “for the long haul;” he advocated educating citizens to think, vote, and act critically in service to restoring the ecological health of the planet. Saylan and Blumstein (2011) directed teachers to specific ways in which they might promote “civic responsibility” in their students. Their definition of civic responsibility included the demonstrated value of voting with consumer dollars. The authors also encouraged an awareness of global citizenship without border, because national boundary lines were crossed when natural disasters struck internationally, and when radiation and spilled oil traversed across oceans to foreign soil (Saylan & Blumstein, 2011).

How to Change Environmental Education

Gardner (1993), who pioneered the promotion of “multiple intelligences” and different learning styles, coined an eighth intelligence in the mid-1990s, termed “naturalist intelligence,” which many in the EE field have now referred to interchangeably as “ecological literacy” (Orr, 1992). Gardner asserted that this was both an innate intelligence and one that is capable of being learned, and that it was important for all teachers to be able to teach students who are “nature smart” as well as visual learners, auditory learners, kinesthetic learners, etc. Orr (1992) and Saylan and Blumstein (2011) have discussed the challenges of understanding ecological literacy in an increasingly modernized Western culture, due in part to decreased access to natural places and in part to how shortened attention spans have been influenced by media culture.

Saylan and Blumstein’s (2011) recommended new definition of EE incorporated interdisciplinary approaches, encouraged community participation from a standpoint of moral responsibility, and advocated immediate integration of EE into every aspect of curriculum by the direct involvement of individual teachers. Saylan and Blumstein also addressed the imperative in shifting from environmental awareness into action, and discussed the kind of projects that have been utilized in schools to influence student behavioral change.

In order to reform education to consciously include ecologically literate perspectives, the following six foundational practices were recommended by Orr (1992). First, all education – by omission or commission – was to be regarded as EE. Second, complex environmental issues required interdisciplinary attention, and were not to be

relegated to extracurricular status nor addressed only in one unit in a science class. Third, ecological literacy was to be regarded as a conversation in which there were no right answers, and education was to include the perspective of both humans and other species. Fourth, the methods of education were as important as the content – this practice was further examined in Saylan and Blumstein’s (2011) exploration of school buildings that were converted to be models of sustainability. Fifth, direct experiences in nature were to be sought, created, and encouraged, as time in nature was essential both to cultivating quality thought and to understanding the environment. Finally, EE was to be valued on the premise that education and reflection in the context of sustainable practices would improve the learner’s competency in other realms (Orr, 1992).

Environmental education – with its hands-on techniques such as project-based education – has been shown to be an effective strategy for engaging students in course material, which has in turn increased student attendance, retention, graduation, and achievement (Sobel, 2004). Continued studies have shown that environmental education methods improved student achievement rates and overall academic performance (Bartosh et al., 2006).

Environmental education has been addressed and updated in the American biology standards, marked by the recent shift from the National Science Education Standards (NSES) to the 2013 Next Generation Science Standards (NGSS). According to Wyner, Becker, and Torff (2014), the NGSS adjusted standard practice so that the study of human impact on ecological systems was embedded into the presentation of ecology in biology class, rather than having ecology and human impact taught in separate units as in the previous NSES. The reported goal of the new embedded role of EE within the biology

curriculum was to educate students in a way that they were able to think critically about solutions for environmental problems, and to recognize the role of ecology in their daily lives (Wyner et al, 2014). While the goals for EE in the two science standards are identical, the EE methods of the NGSS are more pervasive throughout the curriculum and the assessments have been adapted for EE contexts. When the 9th grade biology curriculum was field tested, researchers found that,

. . . increasing the ability of students to understand the complex interplay of humanity with ecological interactions may help students become better-prepared citizens, able to make the kinds of informed decisions about the environment advocated by the old National Science Education Standards and the new Next Generation Science Standards. (Wyner et al, 2014, p. 513)

Evaluation of Environmental Education Programs

The process of evaluating environmental education programs has often included an assessment of the change in the participants' attitudes, understandings, and behaviors during the course of the program. This has been measured with "pre-tests" and "post-tests," which were questionnaires meant to determine whether student knowledge, attitudes, or behaviors had changed during the course of the program. In some cases, these questionnaires were also distributed to parents and measured changes in their knowledge, attitudes, and behaviors after exposure to their children's participation in an EE program (Legault & Pelletier, 2000). These pre- and post-curriculum assessments of knowledge and behavior have helped educators to modify and fine-tune the teaching materials and activities for improved student understanding (Foster & Shiel-Rolle, 2011).

Further research has been called for in the relationship between EE programs and student achievement in other school subjects. Studies have indicated that "using the

environment as an integrating context (EIC) ... improves student achievement in social studies, science, language arts and math” (Lieberman & Hoody, as cited in Sobel, 2004, p.25). Environmental charter schools have demonstrated exemplary achievement results. One such example is the Evergreen School, which earned the highest designation in North Carolina for state test scores. Another is the Environmental Charter High School (ECHS), which attained a 92 percent 4-year-college admission rate for students during its first ten years, in a Los Angeles neighborhood in which many students have failed to graduate from high school (Grayson, 2011). There have been several innovations present in EE that could each have had some beneficial effect on student achievement: experiential learning methods, interdisciplinary content, and increased student engagement in topics of interest. As Grayson noted, it may have been that students who self-select into EE programs were already higher achieving students, and yet it seems improbable that self-selection accounted for high achievement in all cases.

While there certainly were ample EE issues and materials in prior versions of curricular standards, addressed specifically in environmental science and ethics classes, arguments have been made to consider reforming all curricular content so that it is taught through an environmental lens (Bruce, 2011). Bruce investigated effective practices in EE and recommended six pedagogical techniques to be universally adopted in the secondary school study of English language arts. These practices were: developing ecological literacy skills; reading green pieces (“nature” writing or environmental literatures); glean insights from “eco-composition” writing exercises inspired by the environment; incorporating place-based reading material into the canon, including indigenous people’s literatures; exploring the history of environmental justice

movements; and examining the practices of war as an environmental concern (Bruce, 2011, p. 14). Bruce cited numerous writers within the field of environmental literature whom she elected to be included in the new standard literature canon, and noted ways in which the ‘traditional’ literature canon could be utilized to illustrate and explore humankind’s relationship to nature. Saylan and Blumstein, in their 2011 evaluation of EE, found that teachers needed support with the creativity it required to incorporate EE themes into every course in their school.

Instructional Methods and Assessment Approaches in EE

Environmental Education Assessment

Due to the interdisciplinary and often experiential nature of environmental education, assessment of student progress has been addressed with a variety of methods. A study on EE assessment conducted in South Africa by Singh (2011) found that one of the primary goals of EE was to promote critical thinking skills in its students. According to this study, critical thinking was exhibited by students’ ability to transfer concepts and skills from prior situations to solve unfamiliar environmental problems that emerged in a new context. Successful EE students have been equipped with knowledge on environmental topics as well as problem-solving skills, so EE assessments have needed to be designed that not only measured knowledge, but also measured students’ ability to transfer knowledge into action to solve common environmental problems. Because EE curriculum was embedded in various field-based contexts (Sobel, 2004), it was effective to design performance-based assessments that could be conducted in a field setting rather than in a classroom (Singh, 2011).

Singh asserted that the most important ability to assess in EE students was their capacity to apply environmental knowledge to new situations utilizing critical thinking skills. Emphasis on complex thought as a primary component of EE was not limited to educators in South Africa. The learning objectives of an advanced online environmental science course in America were threefold: students acquired scientific facts and vocabulary, students engaged in higher level thinking, and students evaluated cases as practicing scientists would (Misset, Reed, Scot, & Callahan, 2010). Assessment measures in EE that have been shown to be most effective test for the students' ability to conduct such critical thinking, and whether a student has demonstrated an understanding of how things influence each other within a whole system (Singh, 2011).

At the Environmental Charter High School (ECHS) in the Los Angeles County community of Lawndale, CA, students conducted volunteer service learning projects through the school's Green Ambassadors program, which was both a class and an extracurricular club (Grayson, 2011). Students organized community outreach events on such topics as composting and water conservation. At these events, students presented information from their science classes with how-to videos, PowerPoint presentations, and photo exhibitions they had created. ECHS students wrote press releases and blogs to publicize their events, and incorporated the technology of social media into their EE program. ECHS teachers reported that they believed navigating public relations was an important goal of environmental education. ECHS teachers assessed their students' ability to utilize technology to promote their events and to communicate their environmental message. Students also utilized electronic tools in research capacities. As described in Grayson (2011), the ECHS AP Environmental Science class had students

work as “mini field scientists,” using handheld computers with plug-in sensors to test water quality over a three-week period at five different sites in the area surrounding the school's campus. They used technology to gather, record, and interpret scientific data as a major component of environmental education. Effective EE assessment, as Grayson illustrated, must not only measure students’ knowledge, but also assess their critical thinking skills, public relations skills, and mastery of modern technology.

Environmental Education Assessment Methods

Due to the interdisciplinary nature of the subject, the instructional methods used in some programs or lesson plans that fall under the umbrella term, “environmental education,” have often been different than the instructional methods of traditional education in standard subjects, such as reading and math. When the methods of instruction were different, the methods of assessment also needed to change to match the goals and methods of the course. Six secondary science teachers in Northern Ontario, Canada, participated in an action research project which focused on merging environmental education into their science lessons using the Science, Technology, Society, Environment (STSE) model (Steele, 2011). Most of the teachers voiced concern that interdisciplinary activities, civic engagement outside of the classroom, and student-interest driven content associated with EE would be problematic, because they would require a different and unfamiliar set of assessment strategies and tools. The secondary science teachers reported that they were familiar with unit tests, lab reports, quizzes, and skills demonstrations as their methods of assessment, and an adjustment to new assessment methods for EE would be challenging. One teacher’s jest raised the important

question of how developing EE skills and student behavior changes are to be assessed: “I was wondering if you are seen recycling 7 times you get a level 4? Will there be a rubric?” (Steele, 2011, p. 11).

Multiple choice tests. As of 2011, twenty to twenty-five percent of Belgium’s national school curriculum was based on environmental science, and questions on the subject were included in the national achievement tests. In a study on student achievement test results from Belgium, researchers demonstrated that it was possible to measure student knowledge on environmental topics with standard multiple choice tests (Janssen & Crauwels, 2011). Yet these Flemish tests were also intended to measure students’ mastery of complex thinking. The tests were crafted to include multiple choice test items on three levels of Bloom’s taxonomy: knowledge, comprehension, and application.

Saylan and Blumstein (2011) brought forward a coherent discussion regarding the impacts of the “No Child Left Behind” (NCLB) era’s “teach to the test” attitudes on environmental education. Saylan and Blumstein were concerned that as environmental education became integrated into the core standards on which students are tested, the emphasis in multiple choice test items would be on “easy questions” which are “easy to assess.” In terms of EE, the authors asserted that the easy questions were on environmental attitudes, while the harder questions involved environmental behavior. In order to assess specific EE behaviors, Saylan and Blumstein (2011) proposed that EE goals might have to be tailored for factors of locality, culture, and economic status.

Oral assessments. According to Saylan and Blumstein (2011):

If the emphasis in testing procedures in American public schools shifted from the standardized multiple-choice testing to the European method of oral exams conducted by instructors, it would provide yet another opportunity for obtaining qualitative data on program effectiveness. (p. 171)

While Saylan & Blumstein (2011) acknowledged that the oral assessment method of testing was a more expensive model to implement than multiple choice testing, they also asserted that the expense represented a great value added to the school system. These researchers believed that oral exams offered a much more effective means of assessment for students' mastery of EE's complex interdisciplinary action and values-based thinking.

Singh (2011) discussed the process, theory, and results of oral assessments conducted with environmental education students at two higher education institutions in South Africa. Because learners were required to "think on their feet" in response to teacher prompts, researchers determined that oral assessment encouraged students to think critically. In one example from South Africa, students chose members of the class that they worked with in small groups of up to six members. These groups identified and researched a local environmental problem of concern and completed written group project reports. Learners were then assessed orally through discussions conducted within the small group. Assessors asked questions based on the group's research project as well as their class notes. Students were graded on their individual responses, rather than on the group's performance as a whole (Singh, 2011).

Researchers and students both gave positive feedback about this oral assessment process. Educators found that they were able to discern through their

questioning whether a student actually understood a topic, eliminating some challenges that English Language Learners often face. Students reported that they learned through the discussion process of the exam itself, and asked for longer exam periods. Educators asked for the oral assessment time to be built into their course schedules, and they said that the process had also changed the way they would craft their written exams. Singh (2011) cited one educator – excited by the thoroughness of student responses in oral exams – who suggested that rather than multiple choice or specific questions, students were given general prompts to write on such as to share “everything you know about ozone depletion.”

Environmental Education Instructional Methods.

Service Learning and Place-based Education

Service learning, place-based education, and project-based education are terms that have been used to refer to a vast spectrum of educational practices from year-long classroom projects, to whole-school single day programs, to semester-length immersion courses and more (Sobel, 2009). For example, ECHS students complete an environmental leadership and service learning course in Grade 10, a sustainability internship with a community partner in Grade 11, and a senior project related to a social or environmental issue in the community (ECHS, 2015).

In a series of anecdotal accounts of project-based education at American schools, Sobel (2009) established that service learning was a powerful tool not only to increase students’ connection to the Earth, but also to increase connection with local businesses. Sobel accounted stories of students and teachers who took initiative on

research, created advocacy and service projects unique to each school's local community and environmental needs, and linked their own efforts with those of local businesses and public organizations. All of these parties addressed problems in their own schools, municipalities, and ecological surroundings. These efforts were reported to be restorative not only to the problems that the schools' projects addressed, but also supportive for the businesses through the students' volunteer efforts, and also beneficial to the academic achievement of the students themselves. As noted by Sobel:

Through a balanced focus on economic development and environmental preservation, the community and its businesses get revitalized, state curriculum standards are met, and students are given invaluable opportunities to learn in real-world settings. (p. 2)

Sobel (2009) went on to recognize one of the major challenges for service learning, which was that requirements of standardization set teachers' priorities for the time spent in their classrooms, and teachers without institutional support have had to be courageous to carve out time for projects they knew would engage their students. "Emphasis on everybody being on the same page on the same day" was found to "severely hamper schools' abilities to be particularized or adapted to their local communities" (Sobel, 2009. p. 22).

Some schools discussed in the literature were free from the confines of educational standards because their organizations were designed as non-public or nontraditional public schools. Private schools, semester-long programs, and a few but growing number of alternative public and charter schools have created unique whole-school programs where service learning was woven into the whole school design.

Located in Nevada City, CA, the Woolman Semester incorporated project-based service

learning into its curriculum. Students have been engaged in multidisciplinary learning experiences, including on-site community work at the program's rural site. Students worked in the kitchen and the organic permaculture garden, and students were involved in advocacy, service, and activism work in community organizations. Different yet interrelated service projects have complimented Woolman's three core course programs of Environmental Science, Peace Studies, and Global Issues (Woolman, 2011).

Battisoni, Longo, and Jayanandhan (2009) made strong cases for new priorities to have been made within service learning curriculum for the age of globalization, and for the importance of service learning programs that cultivated an active democratic global citizenship. The authors questioned proper application of democratic education in a world made smaller by increased international awareness between populations. Decentralization due to the effects of a globalized economy impacted local communities. For instance, Google replaced the function of libraries in the lives of many, and big corporate stores took over the markets of small businesses. As humanity entered a new era in which decentralized economic effects were magnified and made ever more instantaneous and apparent, the authors made a case that local democratic pedagogies needed to exist symbiotically within global understandings of the world. It was to this end that Battisoni et al. discussed that service learning was best geared toward students' understanding of themselves as global actors in the public sector whether their work was currently on the local, national, or international scale.

In a study of three different U.S. college programs that incorporated local service learning projects into their curriculum, some of the service learning programs involved an international service component. The international service placements were

followed by local service placements, and students engaged in scholarly reflection upon the transference of knowledge, skill, and understanding from studies abroad to one's home culture. Students who served in local public organizations had built skills for a global world, and through engagement on a local level they cultivated "civic confidence and a civic identity" as they gained "essential skills for public work and democratic social change" (Battisoni et al., 2009, p. 93). These researchers gathered several successful service learning practitioners' recommendations. Their recommendations included: interdisciplinary collaboration, parallels drawn between local engagement and international experience that encouraged global citizenship, and that it was imperative that students were incorporated into leadership roles integral to project development and implementation (Battisoni et al., 2009).

Apprenticeships and Internships

Ivan Ilich (1970) recognized the economic circumstance that "the man who has the skill benefits from its scarcity rather than its reproduction" (p. 89). In essence, Ilich argued that the resurgence of an apprentice-based society was an argument for cooperation rather than competition in the marketplace, at least between generations. The idea of apprenticeship gained traction in the recent decade, perhaps due in part to high rates of unemployment and the boom of young people that resulted as they sought inroads to employment. Christman (2012) noted that while the common definition of apprenticeship entailed a professional solely imparting their craft or skill, the relationship between the professional and the apprentice in practice often took on a nurturing quality, and helped young people develop their character and transition into adult life.

Several alternative schools have created successful apprenticeship or internship programs. At Harmony School, students earned the right to pursue mentorships in the community through demonstrated ability to manage their own independent studies. According to the Harmony School website, on the High School Philosophy page (2015):

Students are afforded many opportunities to demonstrate their ability to work independently, and once they have done so, have even greater freedom to design their own work and seek out additional mentors in the community. (para. 3)

According to Eiyler (2009), internships have gained momentum in college career centers, and the press has encouraged internships as a gateway from school life into the life of the workplace. According to the National Association of Colleges and Employers (2008, as cited by Eiyler, 2009), the investment of interns' time at the workplace was profitable, as internships have played an increasing role in job placement.

At the Finding the Good (FTG) semester program based in North San Juan, California, enrolled students experienced two forms of mentorship. Consistent staff members acted as personal mentors throughout the program, and, students and staff travelled as a group to learn together from exceptional teachers in their field setting. FTG's Spring 2010 semester group travelled to Baja, Mexico, learning about the conservation of sea turtles from experts in that work. According to the Synergia Learning Venture's FTG High School Semester website's 'Mentorship' page: "At Finding the Good, we seek out extraordinary teachers and we go to them. They may not even think of themselves as teachers, but in the truest sense, they are" (2011, para. 3).

Lehman Alternative Community School (LACS) in Ithaca recognized that students gained the benefit of skill-based learning with professional field experience that provided invaluable opportunities to understand the world of work, in general, and specifically in

students' prospective fields. LACS reported on their website that student internship experience served either as a first step on a career ladder, or just as importantly, some students discovered through time worked on the job of their choice that it was not the right profession for them, saving themselves years of schooling in a field not to their liking. According to the LACS website *About our School* page:

At any given time, approximately twenty percent of our students work at community placements in areas ranging from horticulture labs and veterinary hospitals to retail establishments and artists' studios. Students work at these placements for career experience or as part of their academic program 'on-the-job. (n.d., para. 12)

Environmental Charter High School (ECHS) of Los Angeles (Grayson, 2011) recognized the value of community engagement as an inherent goal in their apprenticeship program. Placements with businesses and organizations strengthened community-oriented skills for the student, and also for the business or organization itself. Students gave added value to businesses as they contributed additional problem-solving skills and responsibilities at work, and businesses in turn taught students successful skills for the working environment. Student experiences of apprenticeships at ECHS were supported by classroom discussion. Student experiences of apprenticeships at ECHS were supported by classroom discussion. According to the Environmental Charter School's website's *Community Partners* section (2015):

Our partners provide funds, human power, knowledge, and opportunities that allow educational experiences to reach far beyond the classroom and allow our students to engage in relevant, meaningful action. ECS students benefit from the extraordinary opportunity to learn from our Community Partners, whose insight and real-world experience inform and shape students' futures. These experiences give our students invaluable skills and a credible advantage when applying for jobs and colleges. (para. 3)

Conclusion

In conclusion, several points have been learned in this literature review that informed the project. Research showed that responsive and relevant environmental education was effective for student engagement in EE, as well as increasing student achievement, attendance, retention, and graduation rates (Sobel, 2004; Bartosh et al., 2006). Research into EE theory found recommendations to consider that messages about EE were embedded into the curriculum whether by omission or commission (Orr, 2005). Prominent EE authors have established that inspiring students to change their habitual behavior is a goal of EE, and that establishing relevance between academic coursework and the students' personal experiences was the key to creating engaged EE learning communities (Orr, 2012; Saylan & Blumstein, 2011).

Addressing different methods of assessment were required to measure student learning in context-based and complex-systems associated with EE, and measures such as oral assessment were found to be effective to help students think critically (Singh, 2011). Performance-based assessment strategies were utilized in EE's field-based settings (Sobel, 2004), and teachers required extra support to adjust when they used nontraditional assessment methods in interdisciplinary EE contexts (Steele, 2011).

Instructional methods in EE were examined, and it was concluded that service learning and apprenticeships were effective means for project-based EE (Sobel, 2009). Sobel recommended service learning projects as a means to connect students with the Earth and with local businesses. Recommended practices for service learning included interdisciplinary collaboration, making connections between local and global environmental issues, and incorporating students into leadership roles on service learning

projects (Battisoni et al, 2009). Apprenticeships were found to have gained popularity in recent years (Eiyler, 2009) as students turned to internships as a means to transition from school into the workplace. LACS (2011) reported that students gained valuable career experience in their profession of interest, which led to either pursuit or abandonment of that career path depending on their experience. Grayson (2011) reported that ECHS student apprenticeships were supported by classroom discussion in preparation and reflection, practices that were found to be important when instructional design was considered for this project.

CHAPTER III

METHODS AND RESULTS

Methodology

The researcher began with two questions: What are the organizational structures, instructional methods, and assessment approaches used at established alternative high schools? How could the lessons learned from these educational structures be implemented in the generation of a new environmental high school design? While the first question guided the research study conducted at four high schools, the second question guided the construction of this project, in which a new environmental high school was created based on the findings of the research.

In the pursuit of answers to these questions, the researcher studied three instructional methods and three organizational structures. This transformative mixed-methods research study was conducted through internet-based surveys followed by on-site interviews and observations at four established alternative high schools. The results from this research study were used to formulate recommendations for the design of a new high school utilizing similar school practices.

The three organizational structures studied were all-school meetings, individual faculty mentorships, and individualized pathways to graduation. The three instructional methods studied were service learning, professional apprenticeships, and wilderness education. These instructional methods were chosen based upon the

researcher's prior experiences with these methods in the nonprofit EE sector, as well as the demonstrated interest of families that comprised the prospective future population of the proposed high school in Nevada City. As evidenced through school websites and personal communication with alumni and parents from the school, the researcher noted that four participating schools utilized all-school meetings and individual faculty mentorships in which an advisor met with students individually and in groups. Through the observation and interview process at school sites, individualized pathways to graduation also emerged as part of the research. Variations in implementation of the three instructional methods studied seemed to be influenced by the particulars of the three organizational structures studied at the four schools. Together, these six factors affected the students' required experiences along their individualized pathways to graduation. Data was collected on the opportunities and limits of interdisciplinary studies when these instructional methods and organizational structures were used. Reports on these educational methods and structures were analyzed regarding the strengths and challenges of each as measured by increased student engagement, relevance of civic engagement, and preparedness for graduation. In order to design the most effective school possible, the researcher sought to find schools that had used these school practices for a long period of time (ten years or more) in a four-year high school format, and studied the lessons these schools had learned from their experiences with these modes of teaching.

Schools for participation in the study were chosen based upon criteria that the schools had operated for at least ten years, and that they included two or more of the practices focused on in the research study. Approximately 40 schools were approached in the initial inquiry. Some schools were found through personal contacts, and some found

through internet and in-person searches through the Coalition of Essential Schools network, the Green Schools network, and searches based on each of the five instructional design components in the study. Four schools consented to the onsite visit, and so those four were chosen for the study by default.

The research methodology began with distribution of a preliminary survey online to teachers and administrators on the common strengths and challenges that they experienced in implementation of service learning, professional apprenticeships, and wilderness education. Written responses to the preliminary internet-based survey guided the researcher's classroom observations and interview questions for teachers, administrators, and students during weeklong site visits to the four schools. Survey results, interviews, and field observations comprised the three data sources for data triangulation in the research study. The survey and interview processes were guided by transformative mixed-methods research design recommendations from Mertens (2010). Transformative was a term used to describe research in which the participants influenced the course of the research itself. Mixed-methods as a term described that multiple data collection sources were used, and also that some portions of the data were quantitative rankings, while the majority of the research was qualitative descriptions. The research analysis was based on grounded theory outlined by Charmaz (2006).

The study was based upon a 'simple' descriptive research design, in which the term 'simple' refers to a study designed to investigate a snapshot of the schools at one point in time (Mertens, 2010), rather than studying the schools over a duration of time. However, it is worth noting that some of the instructors had been teaching with these methods for ten to thirty years or more. Some of the surveyed teachers had conducted

their own action-based research to improve their instructional methods, and these faculty members offered long-range perspectives in some of their responses. The researcher designed survey and interview questions based upon a literature review of the strengths and challenges of service learning, professional apprenticeships, and wilderness education, as well as the researcher's personal experience in alternative education. Survey and interview responses were used to ascertain whether schools had experienced any of the common strengths and challenges with these methods that had been noted in prior research. Teachers answered these questions in regards to their entire career at the school, rather than limited to experiences in the current school year. Due to the duration of the teachers' experience, the data represented a more historical perspective than was originally intended with the simple descriptive research design.

Data Collection Instruments and Implementations

Survey questions were designed to ask general questions about the strengths and challenges of certain alternative teaching methods. The administrators' survey also included questions about school demographics for comparative purposes between schools, as well as questions about how respondents experienced the goals of the school's mission in action. Questions about teaching methods that were not used at the school according to the administrators were deleted from the second set of surveys delivered to the teachers, in order to conserve teacher time. Surveys also included a question about other alternative high schools that they would recommend the researcher contact for participation.

In preparation of the research surveys in alignment with academic standards, the researcher turned to Mertens (2010) for recommendations in survey design and distribution. The survey instrument was designed as a mixed method descriptive survey, with closed format questions in scalar form and in the form of ‘check all that apply,’ with open-ended options to add additional responses if the respondent chose to elaborate. Email contact and internet-based surveys were chosen as the method of delivery due to time constraints and ease of use (Mertens, 2010). The researcher pretested the Internet survey with colleagues in education fields for constructive quality checks. The researcher also timed these pretests, and then offered example completion times to school faculty respondents in the introductory email that accompanied the survey.

Maximized volume of survey responses was in the interest of the research study. When faculty surveys were distributed via email, the schools had already previously approved the on-site research. Responses received from the surveys were important to the research design, as on-site interview questions were tailor-made for faculty based on their survey responses. Given that “respondents would like to feel important and competent,” (Mertens, 2010, p.181) the researcher made personalized email contacts with the survey request, a technique recommended by Mertens for increased response rates, benefitted by maximized personal connection between the researcher and the school. Query emails explained the specific aspects that the researcher admired in the school’s design, highlighted why this faculty member was being sought for their expertise in their field, and appealed for help with the researcher’s cause to start a new school with similar designs. The researcher also included survey instructions in the follow-up email along with the link, and followed up with non-respondents in order to

maximize responses. The researcher had approximately a 75% response rate with administration and a 40% response rate with teachers in the two internet-based surveys, and a 35% response rate with students in person at Eagle Rock School.

For the sake of response clarity and reliability, the researcher avoided negative wording, emphasized critical words, and specifically defined the value for every option in scalar questions as recommended by Mertens (2010). To minimize the effort and time required of teachers and administrators, multiple-choice questions were prepared on the instructional methods researched in the study. Respondents were given the option to add additional commentary on each question if they felt so inspired. Separate questions were created about the strengths and challenges for each of the instructional methods studied in the research. The order of multiple choice answers for each question was randomized in order to provide variety between responders. Educators were given choices for each category based on common strengths or challenges that the researcher had learned through formal research, or through a decade of experience and collaboration with colleagues in the field of alternative education.

Visits to the high schools were structured around observation of relevant classes that incorporated some of the targeted alternative teaching methods in action, and interviews of teachers and students who participated in these teaching methods. Research was designed to collect anecdotal tales about the strengths and challenges of those educational methods. When scheduling allowed, the researcher observed teacher's classes before the teacher was interviewed, in order to generate as much fodder for dialogue as possible. The researcher made field notes during her observations, and arranged a schedule to visit classes that involved service learning, professional apprenticeships, and

wilderness education. Finally, the researcher attended all-school meetings that took place during the week, and some faculty advisory groups and committees and staff meetings. The researcher focused observations on teacher-student relationships during the classes, and observed students as they engaged in the instructional methods, and took notes on their discussions. During the all-school meetings the researcher focused observations on the logistics of meeting facilitation, frequency, topics, and decision-making methods.

Consent for this research was obtained with procedures that were approved by CSU's Institutional Review Board (IRB), which was required due to the involvement of research subjects under age 18. Special permission was sought and granted in order to request the citation of schools and school faculty by name, in order to credit these institutions and individuals for their contributions to education. Teacher and administrator interviews were recorded and transcribed, and the researcher contacted each participant regarding any quotes attributed to their name in order to ascertain accuracy and confirm their consent to specific quotes prior to publishing. At the two public schools in the study in Ithaca, New York and Vancouver BC, Canada, permission for both research and publishing was also sought and granted by the district school board prior to the research visit. As the research was focused on topics that are neither political nor personal, the conversations generated from the research were not anticipated to ripple through the high school community, and confidentiality was ensured for all students and parents who participated in the research. The researcher attempted to obtain prior consent from parents and students, yet this proved to be logistically difficult because the researcher did not live in the same area. For this reason interviews of parents and students

were limited in number, although the schools had arranged permission forms for group observation.

Student surveys were designed to be distributed on site to gather more student input, yet this was only logistically feasible to be conducted at one of the four schools. Eagle Rock School had obtained parents' prior consent to participate in research, and the residential nature of their program allowed more time for students to interact with the researcher. This survey proved useful for gathering information from Eagle Rock students on their 25-day wilderness orientation course, which was the most extensive example of wilderness education at any school.

Data Analysis

Research analysis was conducted that aimed to create a framework of best practice recommendations regarding the organizational structures of all-school meetings, faculty advisory groups, and individualized pathways to graduation, as well as the instructional methods of service learning, professional apprenticeships, and wilderness education. These recommendations and lessons from experienced practitioners of alternative high school education guided the researcher in the generation of the design pedagogy for a new interdisciplinary environmental high school. While the research study was a mixed methods qualitative design guided by aspects of transformative design, ethnographic studies, and case studies as per the description of Mertens (2010), the study and analysis was predominately based on the grounded theory of research as presented by Charmaz (2006).

Grounded theory techniques were used to conduct the research as well as scan the research data corpus, as per the qualitative analysis methods of grounded theory as described by Charmaz (2006). One aspect of grounded theory was that the interviews and observations on site were responsive to the information gathered in prior surveys, interviews, and observations, which allowed the researcher to generate new questions based on emergent information and theories about best practices. The researcher used “intensive interviewing” techniques that fit with grounded theory methods and involved open-ended questions, clarifying questions and comments, and ending questions that allow the interview to end on a positive note (Charmaz, 2006, p. 28-31). This aspect of grounded theory involved the adjustment of interviews in process using a “constant comparative method” that the researcher used to “test emergent theory as the data is collected” (Mertens, 2010, p. 236). An initial set of open coding was attributed to the data corpus as per the themes that the researcher intended to study, in vivo coding was noted regarding commonly used terms within the discipline, and the researcher utilized axial coding techniques to sort the collected recommendations into a new school design (Charmaz, 2010). Axial coding, as defined by Creswell (1998) and paraphrased by Charmaz (2010), is a method to “sort, synthesize, and organize large amounts of data and reassemble them in new ways after open coding” (Charmaz, 2010, p. 60). In this case, the researcher conducted axial coding in order to organize the recommended practices around a school design that contained interdisciplinary courses, alternative methods of assessment, and individualized pathways to graduation.

The researcher analyzed data collected on instructional methods and organizational structures and noted common themes or patterns that could be used to

inform the instructional design for Earth Arts Academy. Some themes alerted the researcher to certain challenges to be avoided, while others indicated benefits that could be replicated with certain techniques. In some cases teachers or administrators offered recommendations from their observations at other schools, or from their perspectives about what could be done to improve their own systems. These indications were juxtaposed with the researcher's prior experience in alternative education, as well as the preferences of local parents interested in the new school design, in order to formulate the design for the Earth Arts pedagogy.

Results and Discussion

Although the researcher set out to investigate instructional methods, it became clear that the organizational structures of each school had a clear impact on the effectiveness of their chosen instructional methods. Three themes in organizational structures emerged as a primary focus of study and guided the questions that were asked as research was conducted. These themes later became frameworks through which to view the collected data. The three organizational structures studied were all-school meetings, personalized mentorships with faculty advisors, and individualized learning pathways to graduation. The three instructional methods studied were service learning, professional apprenticeships, and wilderness education. Multiple data sources were analyzed to triangulate findings on these school practices whenever possible, between student and faculty surveys, student and faculty interviews, and field notes from the researcher's observations.

Organizational Structures

All-School Meetings

All-school meetings emerged as a topic of study because all four of the schools that consented to the study engaged in this practice. All-school meetings were also of interest to the researcher because they comprised a foundational tenet of democratic education, and Nevada City families had expressed interest in a school that included student decision-making. This topic had not been a focus of the original faculty surveys, although the researcher collected data through observations and interviews with both faculty and students. Through study of all-school meetings, observed patterns arose in how each school practiced the logistics of the meetings such as facilitation and frequency, as well as the topics and purpose of the meetings such as announcements, discipline, presentations, and the relationship between the all-school meetings and the decision-making processes of the school.

Facilitation and Frequency of All-School Meetings. The frequency of all-school meetings varied between the schools in the study, with a minimum of one weekly meeting. Two of the four schools had additional all-school meetings for announcements, with a longer weekly meeting for more in-depth discussions, and all schools had smaller meetings with interested students for discussion on particular topics. Eagle Rock School had a daily meeting, with two longer weekly meetings for larger discussions. Windsor House had twice-weekly meetings that were only for high school students, and one weekly meeting where the whole K-12 school met for announcements and voted on proposals. Windsor House's all-school meeting was followed by a weekly Council meeting to discuss matters that required discussions of greater length, such as proposals

that needed amendments. Attendance at Council was optional and open to all students who were interested to discuss the proposals that were on that week's agenda. LACS had several all-school meetings each week, two shorter meetings for announcements and one longer meeting for discussions, proposals, and presentations. Some LACS proposals were further discussed in student committees, which met twice weekly, and every student was required to join a committee of their choice. A few students participated in committees with staff that met monthly, in addition to their required twice-weekly committee involvement.

Harmony School no longer had an all-school K-12 meeting, as the community decided years ago to have a weekly high school meeting separate from the elementary school. Harmony's principal, Roc Boncheck, shared that he would have liked to return to all-school meetings, but that students and teachers had found it hard to focus and hear the speaker when the whole school was together. Boncheck also said that the high schoolers wanted to have their own "more focused" meeting to discuss things that were "relevant" (Personal communication, 2014). Harmony also had committees that met regularly to discuss decisions at greater length, and the members of these committees were nominated and elected during the high school meeting.

All of the schools involved a student as chairperson for meeting facilitation, although some parts of the meetings were facilitated in part by faculty. The chairperson opened and closed the meeting, facilitated movement through agenda items, took notes, called on speakers, and coordinated votes if applicable. While three of the schools did not use a microphone, the researcher observed a microphone in use at the largest school, LACS. LACS had two chairpersons and a microphone for each meeting, and at the

largest weekly meeting they also utilized a projector and a second wireless microphone, which helped to facilitate the commenters on the proposals up for discussion.

Purpose and topics of the all-school meetings. At each of the schools a portion of the meetings were reserved for announcements, and Eagle Rock and LACS had entire meetings primarily dedicated to announcements. Eagle Rock also included a philosophical moment at the beginning of each meeting, where a student offered a topic for contemplation prior to a brief period of silence. Topics of briefer meetings that the researcher observed included proposals for policies or activities, discussion about and planning for upcoming events, honoring student or staff milestones, and in some instances there were brief presentations or performances. At Harmony, a transgender student announced their new name and preferred pronoun at the high school meeting. At Windsor House the teens in the high school meeting discussed plans for their upcoming trip. At LACS the community service coordinator gave a presentation about the role of service learning in students' lives. Eagle Rock had a daily music slot for a staff or student musical offering, although it was only filled once when the researcher was present.

On two occasions, the researcher observed that the all-school meeting was used to discuss discipline and resolution for situations of concern. At Harmony, students at the high school meeting brought up concerns over bullying, particularly cyber bullying, and discussed the conflict resolution procedures at the school and what other measures could have been taken to protect students. Students at Eagle Rock who had participated in an outdoor living situation as a restorative disciplinary action spoke at the all-school meeting about what they had learned through the action, and discussed their

commitments as they rejoined the community. The Eagle Rock students answered questions in a panel format.

Decision-making in all-school meetings. Each school's decision-making mechanisms related to the all-school meetings in a different way, and corresponded with the degree that students participated in democratic decision-making at the school. At Harmony School the high school meeting was the primary decision-making time. Although some committees at Harmony acted on decisions separately from the high school meeting, school decisions were primarily made in meeting with the entire high school community. Harmony Principal Bonchek shared that it was possible to include students in the democratic decision-making process for every school decision. A Harmony student spoke with the researcher prior to the high school meeting, as she prepared to read a statement she had written which proposed an upgrade to the conflict resolution training and protocol in high school. In the meeting this student read her proposal and launched an active, solution-focused discussion among students and staff. A fellow Harmony student had encouraged her to make this proposal, as he sat on the committee that heard complaints about the ways students treated each other, and he supported her solution. It was clear the students felt agency in decision making at Harmony.

As per the preference of Eagle Rock's Board of Directors, Eagle Rock School did not run democratically with students participating in organizational decisions. The all-school meeting was a time to gather student voice on upcoming decisions and policies, or to inform the students of changes in policy, yet in the end the policies were decided by the leadership faculty. As he discussed how the school emphasized discussion

yet avoided democratic decision making, Eagle Rock's Head of School, Jeff Liddle, mentioned the school's need to defer to the preferences of Honda as per their funding: "Everybody should have some ownership over the place, but it's really Honda's place in terms of ownership and mission" (personal communication, 2014). Liddle saw the school director's role as one charged with the management of dynamic tension between the long term mission of the school, which was to serve public education, and the different voices of the school community who were concerned with immediate issues with current students.

Director of Professional Development, Michael Soguero, further articulated that Eagle Rock was not a democratic decision making place. Democratic education is not a goal of the school, although student voice is considered: "We have a lot of student decision-making here... but in our context, we're not a [democratic] decision-making place – neither with staff, nor with students. We have a hierarchy, with people in charge" (personal communication, 2014). While some students and staff called for more input on decisions, others were happy with the arrangement, such as Instructional Specialist Jon Anderson, who conveyed his appreciation: "At some point the leadership staff have to make decisions... you can't have everyone come to an agreement all the time on things. And not everyone knows the big picture of what decisions are being made." On the other hand, Soguero cited examples of student-driven changes that had been successful, when they were aligned with the school mission and allied with an adult faculty member. "I worked with students on instituting Restorative Justice six years ago, and that was very student driven. I still have the original proposal, it's signed by the students. We ran a class to support people in Restorative Justice facilitation" (personal communication, 2014).

LACS and Windsor House had systems in place aside from the all-school meetings, smaller discussions that interested students attended to refine and define policies in a democratic process. At both of these schools, certain decisions were approved by student votes during the all-school meeting and then moved forward to a faculty meeting. In these schools, faculty had final purview in regards to certain pre-defined topics, such as the class schedule or hiring teachers. At LACS, Principal Diane Carruthers described a carefully articulated decision making process: “Several years ago, a small committee of kids, students and teachers set out to clarify and delineate how shared decision making works in our school. There are certain areas where staff have purview and certain areas where students have purview and there’s certain areas that are shared decision making” (personal communication, 2014). LACS students made decisions by a majority vote, while the staff made decisions by consensus. Carruthers acknowledged that the consensus decisions among staff took longer than voting, yet this was found to be valuable in more weighty decisions that involve big changes in the school, such as when the school was designing the Graduation by Exhibition protocol (GBE). “When you do consensus, then if there are people who are holding back on consensus, there’s an obligation by the community then to do some fact finding and researching so that you can address the concerns of the people who are blocking that decision. We’ve had to do that over the years a few times but most things are pretty quick” (personal communication, 2014).

Carruthers explained that the school had experimented with different models of which decisions are brought solely to affected committees for discussion among a smaller group, versus which decisions were brought up to all 300 students at the

all-school meeting. The agenda committee determined each decision's pathway through various committees and meetings. Carruthers also shared that she had grown over time to trust the students' process as they discussed more unorthodox decisions, although she still wondered how the discussion would go when the students decided to propose and discuss getting rid of Math classes, for example. "Kids are so thoughtful. They might jump on the bandwagon in the beginning and play with that idea a little bit, but then inevitably somebody stands up and says, 'I think Math is really important.' They'll be very thoughtful and come around and make a solid, good decision about whatever the topic is" (personal communication, 2014).

Faculty Advisors

The second organizational structure researched was known as advisory or family groups, the cohort of students that formed around faculty mentors. This organizational structure intended to be researched when the study was initiated, and so the data on this topic was collected from five sources: faculty surveys, on-site observations, faculty interviews, student interviews, and the Eagle Rock student survey. All four of the studied schools had a faculty advisor program. Each school had set up certain parameters and schedules in which students met one-on-one with their advisor, the student and advisor had conferences with the students' parents, and there were also allotted times for group meetings with all of the students in the smaller group to meet together with their advisor. Two of the schools (Eagle Rock and LACS) had multiple faculty advisors within an advisory group, usually two. An Eagle Rock student noted the benefit of two advisors in a write-in remark on his survey, "I have a strong bond with my advisors. They both offer different strengths."

At three of the schools, students stayed in one advisory group with the same advisor(s) for their entire tenure at the school, although they were able to change between advisors if needed. The fourth school had one faculty advisor for each grade, and students worked with four different faculty advisors during their four years in high school. The faculty advisory structures did not necessarily exist in the same way at the inception of the school. One Windsor House student (a senior at this K-12 school) is not sure whether she had an advisor in her first years, “When I first went to Windsor House they were just starting [faculty advisories] up. I don’t even think they had [it] when I just started. So, it has become a big part at Windsor House now to have the advisor teacher” (personal communication, 2014). Other students made remarks about how the advisory structures had changed over time, which indicated that schools had refined advisory procedures over time and developed them to the point when the researcher observed them. Distinguishing observations and patterns in the data analysis fell into two categories: data that regarded the individual relationship between the faculty member and the student, and data that regarded the structure and activities of faculty advisory group meetings. This data was triangulated from three sources: student and faculty surveys, student and faculty interviews, and field notes from observations.

Individual relationship between student and faculty advisor. At all four of the schools, both teachers and students cited the strong relationships between them as a primary strength of the school. Several participants mentioned that the advisor program specifically cultivated these relationships. As a Windsor House student articulated, “I feel a lot more support from the teachers, definitely through my Math and Science because she’s my advisor and she’s my Math teacher as well. So, she gives me lots of support,

which is really good. It's more of a friendship kind of thing, more than just a teacher" (personal communication, February 2014). Another student, who had transferred into Windsor House from a traditional high school without advisors, said that advisory groups were one of his "favorite things." This student said his relationships with the teachers at Windsor House were "way closer" because he had "a lot more one-on-one time with them," compared to his previous high school, (personal communication, February 2014).

The researcher observed close relationships between teachers and students at all four schools. Multiple teachers greeted every student by name as they arrived, and used their name each time they addressed them in class. Teachers moved around the class during independent work time, and personally checked in with students in quiet, conversations. Although this may have been present at the other schools, at Eagle Rock in particular the researcher observed teachers that were aware of when a student was having challenges outside of class. In several cases the researcher observed a teacher respond to a behavioral issue with empathy rather than discipline. In one example at Eagle Rock, the researcher observed as a teacher validated a student's frustration, encouraged them to breathe, and asserted that they would check in after class about 'what's going on.' Afterwards the teacher noted to the researcher that he was one of the student's advisors, and knew about some personal issues between the student and a fellow house member, which had emotionally upset the student and affected the student's behavior. The advisor considered these factors when handling discipline in an unrelated situation.

Although the majority participant feedback on the faculty advising system was positive, participants also reported challenges. Nearly all responders reported that these relationships needed more time to increase their effectiveness. Additionally, 60% of

responding teachers reported in the teacher surveys that they did not feel trained to counsel students about personal issues. Faculty at all schools reported that they thought they would be more effective in the advisory role if they had more dedicated advisory time, yet students noted this as a challenge to a lesser degree. While 100% of Eagle Rock faculty noted this issue, only 29% of students at the same school agreed their advisor “doesn’t have enough time” for them. However, those 29% cared enough about this issue that they wrote comments on their surveys, which said their advisor was “a little busy,” or, “sometimes she doesn’t really talk to me.”

Faculty concern about a lack of available time was mentioned in relation to what they considered “higher needs” students. Some of these faculty members also shared that they did not feel properly resourced or properly trained to assist these students. With this context considered, it made sense that a smaller number of students shared concern over faculty time, as students who reported they needed more time from their advisors may have been the portion of students with higher needs. In some instances the students who answered the survey at Eagle Rock noted that they needed more clarity as to the advisor’s role in discussing the students’ lives with other staff members, and indicated a need for more training on confidentiality: “Some things I’ve told my advisor weren’t kept confidential, and that made me feel uneasy and a little less trusting towards them.” Yet in interviews at all schools, and in surveys at Eagle Rock, the majority of students reported that they did feel supported by their teachers and that the faculty advisory was the primary structure that established those relationships. Fifty-eight percent of Eagle Rock student survey respondents indicated, “I like that there’s an adult

who I can tell what's really going on with my life," with one student adding the write-in comment that, "It is nice to have an adult I can trust."

In teacher survey responses from all four schools on benefits of the faculty mentorship structure, 100% of faculty respondents reported four benefits to the faculty advisor program. Teachers saw themselves as an ally who helped students formulate their individual academic plan to meet their goals, teachers gave insight on the students' life to other teachers, teachers served as a liaison for students who were concerned about relations with other faculty, and teachers reported that students confided in them about personal issues. Less of the respondents (40%) noted that they were liaisons between parents and the school, although this percentage may have been affected because the majority of respondents were from Eagle Rock School, which was residential and had less contact with parents. Eagle Rock teachers mentioned in interviews that they occasionally called parents if there was an issue, so there was some interaction with parents, yet mainly meetings were between staff and students.

Faculty of the Windsor House, LACS, and Harmony schools all reported that they had parent conferences regularly scheduled two or four times per year, and more as needed. All three of these schools' parent conferences included the student in the meeting with the parent and the advisor, and in the two smallest schools (Harmony and Windsor House) these conferences included every teacher from the entire school in the meeting with the advisor, the parents, and the student. A Windsor House student described these conferences in the following way:

We have conference week where you come in on a day, and have an hour meeting with your advisor teacher, and they tell you how you're doing in each class. It's not like a report card in the way that if you're not doing something, it's not, 'oh, you're

going to fail.’ It is about what you could do if you want to get better. I really like that, because it makes it less nerve wrecking to go to conference when you know that you’re going to be supported. You’re not going to [get to] the end of the classes and hear you completely failed. (personal communication, February 2014)

Faculty advisory group meetings. Advisory groups utilized their meeting times in a variety of ways that included social time, emotional support, health education, and organizing for events. All of the schools allocated some advisory group time to assist students as they planned courses and projects along their individualized pathways to graduation. The faculty advisors, more so than the guidance counselors, were largely the ones who guided and validated student’s choices as they fulfilled requirements and goals for their individualized pathway to graduation.

At each school, the advisory group time was used to accomplish decisions and milestones on the pathway to graduation, and guidance and time were provided when students prepared forms, did tests, chose classes, and applied for colleges. Each school executed an informal curriculum during their advisory meetings, which included conflict resolution, social activities, and college preparations. Some schools also had some formal curriculum they covered in advisory group meetings, such as at Harmony, where they addressed health and sexual education during advisory meetings in the first semester of the tenth grade.

Eagle Rock School advisory groups had a weekly meeting, when they attended to school logistics. They also lived with their advisory group in a house together with 6-12 students, and at least one House Parent that lived with the students. The houses at Eagle Rock had social times together, as well as service time in the kitchen, and they also conducted restorative justice circles when a group member’s behavior had been out

of alignment with the community agreements. All four schools' teachers reported that they utilized advisory groups for conflict resolution conversations, although this was only named by administration as a primary function of advisory groups at two of the schools (Eagle Rock and LACS). At least three of the schools also utilized advisory group time for individual students to complete logistical steps for personal projects (such as college applications) while in the same room as the school faculty advisor, who had quiet conversations with some students while other students were engaged in their projects. In this way the group meeting time was used for informal individual meetings.

Individualized Pathways to Graduation

The third organizational structure studied was individualized pathways to graduation. All four schools offered both required and elective experiences for students. This topic emerged as research was analyzed from three sources of data: on-site observations, faculty interviews, and student interviews. Three of the schools offered students highly individualized experiences on their pathway to graduation, which involved independent projects and service learning placements. These schools required certain course distributions and particular required experiences, as well as student presentations of their learning in their courses and to conclude their independent projects. Students at all three of the schools with individualized pathways to graduation required that students demonstrated their education in a culminating reflective presentation prior to graduation. Seniors either gave a presentation on their high school studies as a whole at Eagle Rock School and LACS, or presented exhibitions of their independent projects as at Harmony.

Seniors at Harmony spoke about their independent senior projects. Students named as strength of the senior project that it allowed students to pursue academic and personal interests that were not currently offered in the high school curriculum. One student related that the departure of a former staff member had disappointed her, because the teacher had taught multicultural classes which interested the student, and the current social studies curriculum focused on American History and Western Civilizations. The student reported that she did not find enough non-Western cultural depth in the school's weekly multicultural 'Exploration' sessions, and she planned to pursue a senior project the next year that would expose her to other cultures (personal communication, March 2014). In addition to the independent senior project, Harmony also offered the most extensive opportunities for students to enroll in local college classes. This helped to offset the impacts of the school's small size – Harmony was one of the two smallest schools in the study, with the smallest high school faculty and the smallest range of available high school classes from which to choose.

The Harmony School senior project was designed for students to pursue a year-long apprenticeship experience in a field of interest for a potential future career. Students helped design their experiences and approached professionals to request their participation, although the faculty of the school did provide connections to potential experts in the fields of student interest. These senior projects sometimes involved domestic or international travel. Seniors enrolled in a senior seminar with the High School Coordinator where they coordinated and reflected upon their experiences, and each senior presented their experiences to the Harmony School staff in an end-of-year presentation of their portfolio of learning.

LACS students similarly pursued a senior project and gave a presentation following their Graduation by Exhibition (GBE) procedure. It was an option for students to approach a professional in the field to be an ally in their pursuit of their project. The GBE requirements included compiling a portfolio of their work throughout their time at LACS, in addition presenting their culminating presentation. The GBE system at LACS was created alongside the New York Consortium for Performance Based Assessment, the organization of 28 small high schools that have offered an alternative to the Regents exams, the standardized tests that are otherwise required for all NY students to graduate high school.

The fourth school, Windsor House in Canada, offered two options for graduation with two tracks of required courses that culminated in one of two kinds of diplomas. One diploma marked that high school proficiencies were met: the ‘Adult Grad’ diploma, the equivalent of the USA’s General Equivalency Diploma (GED). The other ‘Dogwood Diploma’ marked college preparedness. This system was put in place for increased graduation rates, and because the school only recently attained accreditation up to Grade 12. In the earlier years of the school most students left Windsor House after middle school, or after 10th grade, and attended and graduated from other high schools. According to alumni and teacher David Gagnon, when he attended the school, “Windsor House didn’t offer a grade 12. Windsor House was only authorized to accredit up to grade 10 at the time,” (personal communication, February 2014). Students who wanted to prepare for college or sought particular programming had previously transferred to other local high schools, as graduation through Windsor House was not an option. The implementation of the Dogwood diploma system aimed to retain these students at

Windsor House for high school graduation and college prep. The second type of “Adult Grad” diploma, for students over age 18, was an intentional choice aimed to retain students who otherwise would have dropped out without graduating.

Students at Windsor House reported that they enjoyed having an option between two types of diplomas. One student who “definitely wants to go to college” shared that she likes “having the requirements really clear” while having the “relaxed and creative environment” of Windsor House classes (personal communication, February 2014). Another student voiced that she enjoyed having the adult grad diploma as an option because she was not planning to attend college. This student was training outside of school to be a professional dancer and dance teacher, and she enjoyed the option to have only one required provincial exam, rather than multiple exams (personal communication, February 2014).

Windsor House high school graduation requirements were created in recent years due to new provincial requirements. Some faculty mentioned that they desired to redesign the school’s new credit and graduation system to be more aligned with the democratic and exploratory philosophy of the school, however, the curriculum at the time of the study was very standardized and mirrored the traditional public schools. As Windsor House teacher Andre Guimond articulated, a group of teachers “have been trying to push English and social studies back, away from the English 10, 11, and 12, Social studies 12, very curriculum-based model back towards an interest-based model. So, we’ve been calling it the modular system and there are some other more progressive [high school] systems out there that we’ve been looking at” (personal communication, February 2014).

At Eagle Rock School, students proceeded on a pathway to graduation that consisted of a few required experiences (including a sexual education class, and a leadership project) as well as fulfilling minimum distribution requirements in certain content areas through a variety of optional courses. The document that the students used to guide their choices was referred to as the Individualized Learning Plan (ILP). The ILP was originally created by school faculty, and utilized nontraditional expectations.

According to Eagle Rock's director, Jeff Liddle:

We started out with our graduation requirements being organized around our five expectations. That was the original purpose of [the expectations]. The original founding staff went with Judy Gilbert, who was the Director of Curriculum, and said, "What would a high school graduate need to know and be able to do?" They wrote a gazillion sticky notes. They grouped them, and named them, and the names they gave them were the five expectations. And then they said, 'we're going to design our curriculum around these five expectations,' and they integrated the curriculum into it. And if you look at the graduation requirements over the years, you see that original document, and its very clearly organized by the five expectations. (personal communication, February 2014)

Over time, Liddle says, the ILP document and the graduation requirements drifted into the traditional disciplines of high school, which correlated with more traditional instructional methods being used at the school.

You see another evolution [of the ILP] and the five expectations are still on there, but the disciplines are the thing that you notice a little more. And then at some point there's an ILP [where] you cannot find the five expectations anywhere. It's organized by math, history, and science, English. If you laid all those documents out, you'd see the drift. All of that drift forces you to teach to certain things, so pretty soon you have to be in the classroom doing lots of math, instead of being out in the field doing lots of math. (Liddle, personal communication, February 2014)

Liddle cautions that over time the nontraditional graduation requirements and instructional methods at their school drifted into more traditional categories because of the training of the faculty. He asserted that because the teachers at the school had been

successful in traditional settings, they drifted towards teaching in a traditional manner because teachers wanted to offer an education to their students that ensured their success. “What happens in a lot of [nontraditional] schools is that there's a gravitational pull that traditional education has. Most teachers, ironically, who are teaching in an alternative setting, have been successful in a traditional setting, though there's something about their values that draws them into this nontraditional place” (personal communication, February 2014). Eagle Rock School has re-dedicated their ILP to the five expectations, during a process in which the Head of School, Director of Curriculum, leadership staff, and veteran faculty members reviewed and redesigned the curriculum.

Instructional Methods

In addition to the three organizational structures discussed above, the researcher originally intended to study three instructional methods: service learning, professional apprenticeships, and wilderness education. Three of the schools included service learning and professional apprenticeships in their requirements for graduation, and two of those schools required community service hours for graduation. While in some cases service learning and professional apprenticeships were one and the same, these methods were studied separately because in many cases service learning experiences were conducted in a group setting without a personal apprentice/mentor relationship – such as community service at a food bank, or a cultural immersion week in service at a Native American reservation. Professional apprenticeships were more rare, and only one of the schools required that students establish this kind of personal mentorship for their senior project, at Harmony. All four of the schools involved some

form of wilderness education, although this was informal and optional at three of the schools, where outdoor experiences were focused around trips. Wilderness education was highly structured at the fourth school, Eagle Rock, where all incoming students were required to do a 25-day wilderness orientation course, and academic courses were offered that integrated wilderness experiences into their coursework.

When interviews, observations, and surveys on the three studied instructional methods of service learning, professional apprenticeships, and wilderness education were sorted and analyzed, three lenses emerged as criteria through which to focus and interpret the data: student engagement, civic engagement, and requisites to graduation. When conversations, observations, and self-reported strengths and challenges of each instructional method were analyzed, patterns arose regarding best practices to increase student engagement, effective strategies for civic engagement in the community, and how a particular method fit into a spectrum of required versus elective experiences on the students' pathway to graduation. The data on these three instructional methods were analyzed in turn, with each method considered in regards to student engagement, civic engagement, and preparedness for graduation.

Service Learning

Eagle Rock School and LACS both had extensive service learning experiences built into their curriculum, although LACS referred to their program as community service. Both schools incorporated local acts of reflective community service as well as long-distance immersion trips, and both schools offered courses with an integrated service learning component. While the Eagle Rock student immersion trip in 2014 was to the Pine Ridge Reservation in South Dakota, LACS students had visited the Akwesasne

Mohawk Reservation for the 17th consecutive year, on the border of New York and Quebec.

Harmony School did not have a service learning component to their academic work per se, although they did have a community service requirement for graduation, and two dedicated community service days in which the whole school volunteered for local organizations or on the school grounds, on Earth Day and Martin Luther King Day. The botany class and other science classes also participated in on-site service work, in which they gardened and installed permaculture and sustainable energy features to the school grounds. While some of their individual students engaged in volunteering, Windsor House School did not have a service learning program, nor community service or place-based education in the high school years.

Student engagement in service learning. In regards to service learning and student engagement, faculty noted that it varied depending on four factors. According to the survey response provided by Eagle Rock service learning instructor, John Guffey, “Service learning has provided many strong opportunities for student engagement in learning and the application of what is learned.” 83% of surveyed teachers reported that service learning “increased engagement from a variety of students,” and with this information the researcher sought to discover, through interviews and observations on site, how service learning increased student engagement. One indicator for student engagement as measured at Eagle Rock School was whether the student went above and beyond the requirements. Service learning does seem to engage many students to go above and beyond required hours to contribute to a project they believed in. The researcher’s observation notebook was filled with notes about students who spoke with

excitement about their service placements. LACS Principal Diane Carruthers noted that, “even though there are 60 hours required, most of our students do well beyond that” (personal communication, March 2014).

The first factor found to affect student engagement levels in service learning activities was whether the student chose the experience in correlation with their own interests. Sixty-six percent of surveyed Eagle Rock students viewed service learning as a way to help themselves towards a career, and interviewed students at all three service learning schools referred to their service learning experiences as preparation for work in that field. An LACS service learning student noted that the coordinator did his best to place students in service learning placements of their choice. This student was able to name a dozen classmates’ placements, and noted several in relation to his classmates’ career interests. These students talked together about their work.

Second, student engagement levels depended on whether the student viewed the work as meaningful and relevant. Fifty percent of surveyed Eagle Rock reported that they were more motivated to learn in such classes because they were practical. Emily Sprowls, science teacher and service day coordinator at Harmony School, reported that high school students in particular lost interest quickly if they sensed that the work they are doing was not meaningful. For this reason, Sprowls discontinued the service placement at the local food pantry, because students gave feedback that the work there was insignificant (Sprowls, personal communication, March 2014). An Eagle Rock student survey respondent seemed to agree with the sentiment that meaningful service work was important to students, writing in the statement that, “Sometimes the service feels pointless, like there is better things to be doing.”

The Spanish teacher at Eagle Rock, Jonna Book, coordinated a service learning component to her high school Spanish class, in which her students taught Spanish to children at the local elementary school. She remarked that the experience of service – and teaching, in particular – inspired students to engage in learning activities who may not otherwise have enjoyed class.

I've found that the most meaningful experiences are when students have something deeper, some higher purpose. Even students that may be struggle a little more in the classroom, you'll find them taking ownership over [teaching] and leadership and being super jazzed. My theory is that they let their guard down because the kids look up to you and really see you as a teacher. (Book, personal communication, February 2014)

Third, student engagement in service learning depended upon whether there was a professional mentor who oversaw the project, whether the student admired this person, and if the professional had sufficient time to mentor the student. Sixty-seven percent of surveyed teachers reported that teachers gained knowledge while learning from professionals alongside students. Teachers also reported that students developed positive mentorships with project leaders. However, not all mentorship relationships were positive. It seemed that many of these challenges are related to scheduling and available time: 80% of surveyed faculty reported that there were scheduling difficulties between the school and the professionals at the placement site.

One Eagle Rock student shared that she had a placement on a farm where, “The mentor who was supposed to work with us there didn't really take it seriously and work with us much there in terms of a curriculum at the farm,” (personal communication, February 2014). This student felt that in the unsupervised hours of farm work she did learn about farming, including how hard weeding is, and that the experience was

valuable. However, she needed to do her own research to learn certain things without a mentor. She researched on her phone to find whether certain plants were crops or weeds, for example, “But it was really hard to learn a lot - it was self-taught.”

In contrast to this story, an LACS student who was interested in environmental activism spoke highly of his mentor on the anti-fracking committee, and a Harmony senior who was engaged in a service-oriented senior project spoke of how important their mentor was to their experience. Further, an Eagle Rock student spoke highly of the firemen he was getting to work with. The researcher observed students speaking with National Parks employees about their jobs during a break in their class, an indication that the students were both engaged and comfortable with the Parks employees enough to pursue conversations during their free time. The researcher also observed Botany students at Harmony School engaged alongside a local permaculture professional to create the design for a new garden. Several students spoke aside to the permaculturist, asking her questions about her own garden, which indicated that the students had an interest in the person as well as the topic.

Eagle Rock teacher Jon Anderson, teacher of service learning and apprenticeship courses that coordinate with Rocky Mountain National Park, spoke about how he viewed lack of mentor involvement as one of the main challenges with both service learning and professional apprenticeships. Anderson also did outreach work with Big Picture schools that emphasized internships, so he did have a broader perspective from which to comment that scheduling challenges were a “common mentoring problem” and that “it happens a lot that someone says they really want to do this, and then they don't have the time” (personal communication, February 2014). Anderson hypothesized

that situations with low mentor involvement arose because professionals' schedules are full, and they wanted to work with a student yet didn't realize the time commitment involved. He had thought about designing a form or rubric to assist mentors with "some reflections for self-selection, to help them sort that out ahead of time," (Anderson, personal communication, February 2014).

Finally, LACS teacher Jon Raimon reported that student engagement in service learning was affected by whether the service took place independently or with a group of students. Jon Raimon has coordinated service-learning oriented community service placements at LACS for close to 20 years. Raimon has had challenges when he sent groups of students to do service at a site together, with results that depended on the emotional maturity of the students (personal communication, March 2014). He had since developed a preference to either send an adult supervisor along with the group or to do individual placements. "If things do not go well [in a group] and they're playing off with each other it's going to be worse. I still think the individual things are better, if you can. That's a lot of work or try to do it where it's a group with an adult, where you or some adult from the school is going and helping out" (Raimon, personal communication, March 2014).

Civic engagement in service learning. Eighty-three percent of surveyed teachers reported that service learning generated positive community relations. Eagle Rock service learning instructor John Guffey reported in his survey response that, "I think of service learning as a means of learning how to 'be in the world,' a powerful approach to gaining an ethical framework." The researcher sought to understand how service learning fostered positive community relations. Civic engagement of students in

the community was reported to vary in relation to service learning depending on three factors: preparation, responsibility, and continued relationships.

First, both teachers and students reported that the preparation that students received prior to their service learning placements had a great deal of impact on the students' preparedness to engage in the communities where they served. It was noted that this preparation particularly increased civic engagement when cultural study was involved, such as in preparation for a service trip to a Native American reservation, or for a placement at a juvenile prison. Both Eagle Rock and LACS had prepared students extensively and formally for the cultural context beforehand, and then interacted in informal ways with the individuals within their placements. John Guffey, service learning instructor at Eagle Rock School, shared the motivations for the pre-placement preparations:

We want our students to move from seeing poverty when they go there... to seeing the growing community that's taking charge of its future, and turning to its past, acknowledging the strength of its history and being proud to share that, and not feeling that they're threatened for sharing that history that they're putting themselves at risk. There's lots of issues that need to be addressed, and I want there to be a lot of guidance regarding when do we push forward and support [the residents on the reservation], and when do we recognize that we are contributing to the problems that they're experience. It's a huge exercise in Native history. (personal communication, February 2014)

LACS teacher Jon Raimon also coordinated a service learning placement at a Native American reservation, as well as placements at a juvenile detention center and dozens of other placements. Raimon cautioned about the implications of the word "service," and an imbalance of power that unintentionally be promoted by this concept. To combat power imbalances, Raimon focused on interpersonal relations. "A lot of it is people getting to know each other as individuals but with a cultural aspect," said Raimon

(personal communication, March 2014). Raimon shared that the readings and videos that they studied began with examining stereotypes and attitudes towards different groups of people. Students also examined avoiding cultural appropriation, and how to be respectful of different symbols and content of various cultures. Raimon's LACS students participated together and made a poster that illustrated how to be a culturally appropriate non-native ally. Raimon also invited his students to examine what 'service' was, and encouraged them to look at the projects as 'work' that they are doing alongside another group of people. "We are helping out so it's one of those things that really does generate some good conversation about what is service, that it's a two way street and all that... I'd call it more of a cultural exchange" (Raimon, personal communication, March 2014).

Eagle Rock service learning teacher John Guffey found unique challenges arranging service placements in Eagle Rock's wealthy rural setting that engaged students from primarily urban environments of poverty. The students experienced challenges engaging because they failed to see the relevance and impact of work with the comparatively wealthy community. Students expressed a desire to meet "real needs," preferring to work in under-resourced neighborhoods in Denver, an hour and a half drive away from the school. Says Guffey:

They want to go to Denver, because they say 'those are my people,' or 'that's where I sense is the need.' And it's been a real interesting reality check for me to say, I'd like to take you to Denver but that isn't as reasonable. We can't go there for every class period. But we can scaffold every experience and work to understand that it's not necessarily about helping people who are less well off than you, but it's about a reciprocal exchange. (personal communication, February 2014)

Second, students' civic engagement increased during service learning placements when organizers in the community where they were serving welcomed the

students into positions of responsibility. This responsibility seemed directly relevant to whether students experienced that they helped people in meaningful ways that the students could see making a difference. Eagle Rock's Director of Curriculum, Jen Frickey, shared an example of a service learning course where students engaged in a meaningful way in the wealthy rural community in the Fall of 2013.

[The teacher] in Societies and Cultures taught a class that addressed climate change. Because the flood had just happened, she used the flood as a case study to look at climate change, and to examine where a flood fits into climate change. As a way to bring the students more in touch with the flood and what really happened, they did service projects around the town and saw on the ground what kind of damage had happened and what recovery efforts were happening. (personal communication, February 2014)

The researcher observed several students who referred to their experiences serving in town during the flood. It seemed that it made a lasting impression on students that they were able to perceive themselves meeting a need in impactful ways, such that the students still spontaneously remarked about these post-flood service experiences months afterward.

Third, it was reported that the students involved in service learning were more engaged with the members of the community where they served if the community members had a continued relationship with the school. Conditions that indicated a continued relationship with the school included if the service learning placement continued in subsequent years, if there were interactions with the community host outside of the context of the placement, or if the community partners attended events at the school at other times of year. LACS students remarked about how meaningful it had been for them to visit the Akwesasne Reservation and meet students who later visited them at LACS. These two schools with dedicated service learning programs had intentionally

created these reciprocal relationships, and the students gained an opportunity to get to know the people they were working with over time and in a variety of contexts. Eagle Rock service learning teacher John Guffey shared that the school had previously held an event that welcomed the leaders of community organizations, who were willing to have students work in service learning placements at their sites, to the school for a breakfast three times a year during Eagle Serve, which was a two day service marathon.

We'd have community members over here [for breakfast and round table discussions], and then the students would go out to serve with them at their organization. Leaders in the community, people who were willing to volunteer their site, were excited to come and just have breakfast, and the next day we'd go and be at their site so it would be an exchange. (personal communication, February 2014)

In addition to the benefits of school visits from community members that forged connections, a continued relationship over time was also cultivated as the school worked at a site over a period of years. At LACS, Jon Raimon has brought students to the Akwesasne community for close to two decades, and built a trusting relationship over time. Raimon shared that one student went to Akwesasne with LACS and also with his religious group, both service-oriented trips. Yet the student remarked that when he visited with the religious group it seemed clear that the group were outsiders, while when he visited with LACS the group of students were warmly welcomed and invited to participate in many more events with the community. Raimon felt that this difference was due to the increased trust that comes from working together over time (personal communication, March 2014). Jon Anderson, coordinator of the four year service learning program through Rocky Mountain National Park, shared that sentiment:

Part of the partnership is really knowing each other well, and trusting each other. They trust us to give them interns who are really going to work with them well for the summer, do their jobs and work well with the volunteers and be professional to

visitors. So I think a big part of the partnership piece is really built on trust. (personal communication, February 2014)

Service learning requirements for graduation. With the final analysis of service learning in regards to its role in fulfillment of requirements for graduation, two main tenets were noted. First, at the two schools (LACS and Eagle Rock) in which service learning placements were required for graduation, there were established structures for the process of reflection and feedback at the completion of the placement experience in order to synthesize and integrate the lessons learned in a scholarly manner. This included smaller-scale reflections with the teacher and classmates during the course of a semester, as well as more formal reflections at the end of the school year and at the end of the high school career.

The researcher observed as students composed essays about their service experience during one class at Eagle Rock, and as they spoke with a teacher at LACS about writing their reflections. Both schools included presentational assessments at the end of their coursework, during which time student spoke formally about their experiences in service learning. LACS veteran teacher Chris Sperry, shared that the service component of the school was developed as a requirement for graduation based on a student-driven conversation, and that the impact of this experiences was clear upon graduation.

At graduation at ACS, along with a number of other things, the farm and the connection between environment and school, service is one of the fundamental things that more than half of the graduates speak to as having been effective in their lives. (Sperry, personal communication, March 2014)

A second common tenet the researcher found at these schools which required service learning for graduation was that they tended to have a structure available where

the students could pursue this requirement during class time, either through a school-facilitated course or through an independent study with a supervising school teacher. LACS students were required to complete 60 hours of community service hours, which many students did by signing up for Mr. Raimon's community service class. Students in this class left the school two afternoons per week on a bus that dropped them off at assorted community service placements in the city of Ithaca. The students attended class on the other days per week, reading research about and source material from the communities in which they were of service, and utilized this class time to reflect on their experiences.

Eagle Rock's Director of Curriculum, Jen Frickey, shared that she was aware that a teacher could be challenged as they tried to implement service learning into their curriculum. Eagle Rock staff noted that incorporating service learning into academic classes was a challenging task, on top of the normal rigors of running a class. They noted that teachers needed support and a structure into which service learning could be incorporated.

Like many schools around the country, we are walking that tight rope - our instructors feel this pressure that we need to up the academic rigor of what we're doing in the classroom academically. So they don't have time to incorporate as many service learning projects as they see it in their curriculum. (Frickey, personal communication, February 2014)

Yet Frickey was interested in teachers getting helped to overcome these obstacles, and Frickey expressed a goal to incorporate service learning in some fashion into most if not all of the courses at Eagle Rock. "I think it's part of my role as Director of Curriculum to say [to the teachers], 'You feel constrained on why you can't do this in

your classroom- Let's talk about it, let's work it out, let's put some supportive systems in place to help you do it better” (Frickey, personal communication, February 2014).

Class structures provided school faculty members with the context and time to oversee students’ preparation, placement, and reflection upon service learning experiences, thus helping the school to determine the efficacy of the student’s work in the placement. For cultural immersion experiences, the schedule was arranged to allow preparation and reflection on either side of a trip, such as at Eagle Rock with their trip to Pine Ridge Reservation:

The culminating experience is to go up and spend explore week there, and then come back and do a presentation, and that will be their five week course. Then we're planning a longer trip in the summer, which will be part of the course. It will be a five week class with a three week trip embedded in the five weeks. (Guffey, personal communication, February 2014)

At LACS, the class structure helped to provide a context for Jon Raimon to incorporate the reflective portion of the service learning experience – and he shared that even within the context of a class, he experienced challenges with student engagement in the reflection component after their placement. While Raimon aimed to cultivate a reflective experience for all students while they were engaged in service, he found it challenging to carve out the time and gather reflections from all students.

It’s really hard to meaningfully get the kids to reflect on the experience when you’re trying to catch them in the hallways and get them to e-mail you. So I ask them to meet [...] when I can get them to meet with me, like during a lunch or that kind of thing. Some of them are really good about meeting, but not everybody. I also try to reflect if this is really important. I try to be flexible about how to do it but then when I’m flexible about how to do it, people just don’t do it. (Raimon, personal communication, March 2014)

At LACS, Jon Raimon coordinated service learning placements for all students. These included the Akwesasne trips, while he also taught an academic course

load that included some service learning and some English courses. Raimon offered his opinion that there were enough responsibilities associated with coordinating community service placements and reflection on these opportunities that service learning coordination could be a dedicated fulltime position (personal communication, March 2014). John Guffey at Eagle Rock was teaching a full course load – which included service learning components in both classes that he taught – and he also supported some other teachers in their incorporation of service learning. Guffey also shared that he could better support service learning at the school in general if he were teaching less courses (personal communication, February 2014). It is apparent from these two individuals that the incorporation of service learning into courses does require a significant time commitment, and that ample faculty support for these programs is required for their successful integration into a student's requirements for graduation.

Professional Apprenticeships

Overview of professional apprenticeships at the four schools. Data regarding apprenticeship and internship programs was gathered from two of the four schools. While apprenticeship and service learning are often overlapped in programming and data, and were therefore described in the service learning section above, the researcher considered as an apprenticeship any programming that involved a personal relationship between a professional and a student in which the professional guided the student in activities in their field.

Eagle Rock School had an internship program integrated into its class offerings, Harmony School set up all students as apprentices with professionals during their senior year project, and LACS allowed students to set up a professional internship

as an optional part of their senior year project. Windsor House School did not have any formal internship experiences, although parent volunteers sometimes presented trainings related to their professions to students within the school building.

Eagle Rock School's professional internship program has placed students in apprenticeship positions with Park Service staff at Rocky Mountain National Park (RMNP) for over five years. There has been one primary point person from the Park Service, Ben Bowman, and an additional 25-30 Park Service personnel – including researchers and firefighters - who collaborated with Eagle Rock Instructional Specialist Jon Anderson, the coordinator of the RMNP internship program. The fire program was in its second year in 2014. The first five weeks of class educated students in the logistics of work in the park alongside the other student park interns, and the second five weeks trained students as volunteers with the Hot Shots. A number of students went on from the volunteer program and completed their federal resumes and background checks, becoming professional employees of RMNP during the summer break and again after graduation.

Other types of internships existed in the national park, including research-based positions. The internship classes ran with as few as two students. RMNP staff relied on Eagle Rock admit only students to the program whom the Eagle Rock staff judge to be appropriate candidates for professional conduct and customer service (Anderson, personal communication, Feb. 2014). In addition to internship classes, Eagle Rock had separate Citizen Science classes integrating research in the park with academic Science topics, taught by Science Instructional Specialist, Janet Johnson. Based on the success of the RMNP program, Eagle Rock had also started a summer internship class –

now in its second year - and set up students in placements in other local organizations such as an organic farm, a horse range, a childcare facility, a veterinarian, and the local hospital. Students attended their placements two days a week and reflected upon their experiences for two days a week in class.

The Harmony School seniors did often arrange a mentorship with a professional in a field of their choice, considering whether the career is of interest to them to pursue after graduation. LACS students similarly pursue a senior project and give a presentation as per the Graduation by Exhibition (GBE) procedure, and it is an option to approach a professional in the field to be an ally for the student in their pursuit of their project. However, this was not an emphasized part of the LACS curriculum, and the researcher did not collect data on apprenticeships from LACS.

In terms of teacher feedback on the benefits of professional apprenticeships and internships, 100% of responding teachers reported that project leaders offered personal support of students. Additional benefits cited in the surveys included increased opportunities for student alumni career placement, decreased discipline issues at the service site, and that professionals offered valuable feedback to the students under their supervision.

Student engagement in professional apprenticeships. In regards to the second instructional method studied, professional apprenticeships, the first criteria of analysis focused on data that was related to student engagement. Student engagement in professional apprenticeships was affected by factors of student choice in the subject matter, student interest in the profession as a future career, mentor availability and teaching style, and meaningful work. As with service learning, a common thread

regarding student engagement in apprenticeships was that the students had a high degree of choice regarding the setting in which they worked. At the Harmony School, the fact that it was an independent school indicated a high degree of student choice to attend and therefore engage in the senior project. The senior project involved an apprenticeship in most cases, and the students chose to attend this school in part for that apprenticeship experience. According to the principal and founder of the school, the senior year project was often cited as a reason that students stayed at, or returned to, Harmony for their senior year. He elaborated:

There [were even] some times that kids that have transferred and have gone to Harmony at elementary, and left for a year or two, and come back... even the second or third year [of] high school, some people come back just because of the freedom of the senior project, and the idea that they really want that opportunity to be able to have that kind of experience. (Boncheck, personal communication, March 2014)

As with service learning, the student's relationship with the professional mentor was reported to have an impact on the experience and the engagement of the student. While the availability of the mentor had an impact on student engagement, as supported by the data described above in the service learning section, the teaching style of the mentor also had an impact. In terms of selection of professionals to oversee the students, all three schools that placed students in outside internships cautioned about checking to ensure that professionals actually had enough time to properly dedicate to the students under their care. "People are just so busy, and they really want to help our students, but the reality is that [some] don't really spend the time to mentor them well" (Anderson, personal communication, Feb. 2014).

In the case of Eagle Rock's relationship with Rocky Mountain National Park (RMNP), Eagle Rock had encountered different teaching styles between the Workshop Model used by Eagle Rock, and lecture-style presentations used by the park employees based on their experiences in their own traditional education background. Anderson worked with park employees and trained them in alternative and experiential presentation styles, which they found more effectively engaged the students. Anderson found that the park staff members were interested in teacher education.

I think that they've really seen that when their researchers talk to the students in [lecture] mode for longer than 15, 20, 30 minutes, then they just lose them. So I think they've seen the value in changing that, and I've done some trainings with them on what learning targets are, just how we use them – so it's great that they're open. I think it'll just keep getting better, and at some point I think will try to do a larger training for more staff. They've asked for it, so I think we'll just see if we can make it happen. (Anderson, personal communication, Feb. 2014)

The engagement of students in certain fields inspired other students, who asked for the schools to arrange internships in other fields that were of interest to them. According to Eagle Rock Director of Curriculum, Jen Frickey, the success of the RMNP internship program encouraged the school to create internship programs that provided professional apprenticeships for students interested in other professions.

Jon Anderson has spent the last five plus years working with the National Park, and so that one is a specific summer class that focuses on getting students internships at RMNP. Because we've had such good success with that, last summer was the first time that we set up a general internship class... For the students that say 'what about me? They're having this amazing experience, and I don't want to be a park ranger.' So last summer we started an internship class for the students would go off to work in a childhood early educational center, or at a farm, or at a vet, so they could get that experience. We're at the beginning of that, looking at how the students could get internships in other areas and start to connect with these other professions that they might decide they want to do that and start arranging experiences after school. (Frickey, personal communication, February 2014)

Student engagement levels were high at personal apprenticeships at the 4two schools that had these programs, possibly because the apprenticeships were entirely the students' choice. Some apprenticeships were in the context of small classes of students, and some were in the context of solo independent projects overseen by external professionals in the field. Usually apprenticeships were in careers students were interested in as potential fields of future employment, and students were investigating whether these careers seemed well fit for them. Eagle Rock designed the RMNP internship program, which included a 10-week course during the spring for students who were interested in the summer internship program in the park or the Hot Shots internship. This spring introduction gave students an introduction to the experience, and five weeks of preparation at the beginning of the trimester prior to entering the summer internship. This system was implemented after prior students were challenged because they had little to no experience with the demands of fighting wildfires, and later students in the revised program understood what was expected of them in the firefighting experience (Anderson, personal communication, February 2014).

One Eagle Rock student participated in a summer internship program at an organic farm, and she reported as one of the strengths of the experience that she learned much more about the challenges of the farming profession and developed a realistic impression of the difficulties of the career. Although she found, "You know, it's hard. You can get heat stroke," the student was motivated to continue and felt proud of her efforts in the field, and she developed a greater respect for professional farmers through the internship (personal communication, Feb. 2014). Students reported that their engagement increased in response to the level of instruction, presence, and availability

that professionals offered students in a mentor capacity. School faculty reported that students in apprenticeships seemed more engaged when their work involved a sense of responsibility. The Eagle Rock farm student also expressed that she felt the experience was meaningful because the help of the student volunteers made a significant contribution to the work of the farm.

Civic engagement in professional apprenticeships. In regards to the second criteria of civic engagement, professional apprenticeships increased the student interaction with the community members in the field of their apprenticeship. Factors related to students' civic engagement through professional apprenticeships included professional behavior standards, safety protocols, and the paperwork involved in entering the professional field.

Regarding student behavior standards, Eagle Rock's Jon Anderson (personal communication, Feb. 2014) was impressed by the capacity of the students to adjust their behavior between the informal residential context of the school grounds and the professional conduct in the community service positions at the park. Anderson described how professional conduct was required to serve guests in the park, and although students were spoke and acted informally at school and with teachers, they became appropriately professional as they served the customers of the park and worked with the RMNP supervisors. Anderson attributed this attitude shift to the effect that being in a position of responsibility had on the students, which was confirmed by a student who reported that he "liked that they trusted me to take care of things in the park. It made me feel like a professional" (personal communication, February 2014).

Students in the RMNP intern program were challenged by the rigid federal safety standards in the park, which are less compromising than the school's policies. These standards occasionally led to the exclusion of a poorly prepared student from the day's work, and Anderson began to emphasize the importance of this preparation for the students. Whereas the Eagle Rock teachers' philosophy was to allow students to suffer the natural consequences of poor preparation, federal standards did not allow students to participate in a day's programming without the required attire. The school population needed to adjust to meet the park's expectations, as the park was not able or willing to accommodate exceptions.

I tell [the park employees], 'Look the bus is right there, and if this girl is out here freezing for an hour, that's just a natural consequence. Right? And I can see the bus, and I know that no one's going to die.' But for the federal government, they're just like: 'No.' (Anderson, personal communication, Feb. 2014)

Students were also challenged as they attempted to engage with professional internship when there was unfamiliar paperwork involved. Anderson noted that Eagle Rock students had a challenging time fulfilling deadlines on time, and this was not an arena of civic engagement where most of the students had much experience. Anderson learned to be firm and very clear with students about the importance of fulfilling the park's expectations regarding safety and paperwork. Anderson explained,

I think deadlines in terms of getting our students on board with their paperwork and all that – I know it's frustrating for me and it's frustrating for the park – there are students that don't follow through well sometimes. I'm not sure we have necessarily solved that problem, but we keep getting better, and part of that is offering more support to our students. (personal communication, February 2014)

Additional paperwork issues related to civic engagement through apprenticeships involved professional background checks for employment with the

National Park. Some students reported that they found federal resume and background check to be intimidating. Anderson explained that with some students who had juvenile records it was imperative that they were honest about their past, because any undisclosed incidents would have led to automatic disqualification. Occasionally, if a student had a police record, the clearance process with lawyers took too long for the student to continue on after the class into park employment. In one case, Anderson said that a student whose background check did not clear in time to proceed as an intern continued with the internship program as a volunteer rather than a paid park employee. In a subsequent time period, the student cleared the background check and was then hired by the park (personal communication, February 2014).

One of the reported strengths of the senior project design at Harmony School was that the students were not focused on academic content but on the question of what the student wanted to do with their life. With consistent exposure to the profession over the entire school year, the student got a well-rounded picture of many of the aspects of a career. The researcher attended a meeting of eight seniors where they discussed their projects with the researcher, and reflected upon their process and their mentors. In all of the cases the students had arranged a personal mentorship with a professional in their field, although in one case the student proceeded without a mentor.

The students involved in these senior projects spoke about how their professional mentor had welcomed them to work alongside them in their office or in the field. Students shared that they felt they gained experience in the profession and saw much more of the workings of the profession than they would have if they had been studying in a class. Five of the six students were inspired by the experience to continue

working in the profession. Four of those students planned to pursue the study in college, and one student had decided to go directly into work experiences, perhaps pursuing college later on. The sixth student had learned in the course of their project that the details of the profession were not appealing for them to pursue as a career, and the student planned to explore different career options in college. The single student who did not work alongside a mentor had travelled abroad pursuing an interest in art and art history, and their contact that had originally agreed to be their guide in the other country had fallen through upon the student's arrival. The student pursued self-guided explorations in the foreign country and stayed in close contact with their faculty advisor back at Harmony School, who supported the student in the student's endeavors with consultations and reflections on Skype.

All seniors at Harmony were supervised by the senior advisor, Sallyann Murphey. The senior advisor helped to guide the students through the logistics of their project and checked that they fulfilled the requirements for graduation. Each senior had a Harmony faculty member who supervised the completion of their senior project through the school. The discipline of their supervising teacher depended on the student's discipline of choice for their senior project. The Harmony faculty member helped to guide the student in choosing their essential questions, and provided links and connections to professionals in their field of choice. The Harmony faculty did not generally provide academic guidance on the senior projects. Faculty member Emily Sprowls, Science teacher, who helped oversee senior projects that were related to fields in Science, described the type of support offered by faculty:

Their focusing questions or central questions are not Science questions... Rather, 'is marine mammal conservation a field that I feel like I could work in?' ... They're all personal questions. They may be doing Science stuff, and I may point them in a direction or say I know this person or that person, but the focus of the project is really about what do they want to do with their lives? What do they want to try? (Sprowls, personal communication, March 2014)

The opportunity for civic engagement in the field of a future career offered high school students an entry into their profession, which benefitted their high school career and potentially benefitted their professional life after school. In some cases, particularly when the student decided to continue pursuing the profession as a career, there appeared to be lasting relationships with the professionals that extended beyond the student's high school career, and sometimes led to post-graduation employment. Eagle Rock Director of Curriculum, Jen Frickey, identified that one of the strengths of the internship program was that it allowed students to become a specialist within an otherwise generalist curriculum, particularly for students who were passionate about the National Park Service. There were students who wanted to be firefighters, rangers, or scientific researchers. One student in particular had utilized her time at Eagle Rock to prepare for a career in research:

[She] went through a couple citizen science-based classes earlier in her career, really liked it, so last year she did a summer internship in the park, and loved it, and stayed on working through the summer. And then this year, she's helping co-teach some classes in that area, and this summer will be leading the internship class to that. So she's leaving here with an excellent resume as a specialist in that area. I would say that she's had to do a lot of work to guide that, but we have enough flexibility in our curriculum that she could guide that with the school's support. (Frickey, personal communication, Feb. 2014)

In addition to supporting students in their pursuit of potential careers, data analysis revealed a number of other reported benefits to apprenticeship and internship practices. In terms of teacher feedback on the benefits of professional apprenticeships and

internships, 100% of responding teachers reported that project leaders offered personal support for students. Additional benefits cited in the surveys included increased opportunities for student alumni career placement, decreased discipline issues at the service site, and that professionals offered valuable feedback to the students under their supervision. In terms of apprenticeships facilitating students' civic engagement with community members beyond their individual professional mentor, this capacity was largely determined by the nature of the profession; while some public-oriented professions involved the students in a wide range of interactions, some professions were solitary pursuits, and students spent the apprenticeship time alone with their mentor.

Professional apprenticeship requirements for graduation. Finally, in regards to graduation requirements, the three schools that offered apprenticeship experiences did not require them for graduation. However, these experiences helped students fulfill requirements for graduation. At Harmony School the required senior project often involved a professional apprenticeship of some kind, and the seniors presented about their apprenticeships at the completion of senior year. At Eagle Rock certain courses were offered which involved apprenticeships or internships and these courses fulfilled requirements for graduation in the associated distribution areas on the school's ILP document. Students presented about lessons learned in their apprenticeship experiences during a presentational assessment at the completion of each semester, the Presentation of Learning (POL). At LACS, apprenticeships were not explicitly required, although community service placements that fit the apprenticeship definition were used to complete the 60 hours of community service required for graduation. Some of the students' service learning placements that they were involved in through the service

learning course at LACS also fit the description of professional apprenticeships as defined in this study. Students at LACS completed their Graduation by Exhibition (GBE), which included a presentation at the conclusion of their high school career, and all apprenticeships they participated in were described during their presentational assessment and prepared portfolio.

In all of the researched schools, programs which utilized the apprenticeship part of the student experience to fulfill graduation requirements required three things: a faculty mentor at the school who oversaw the student's involvement in the profession, a classroom or otherwise adult-supported experience that provided a venue for preparation, support, and reflection, and a presentational assessment format that allowed the student to demonstrate their learning during the apprenticeship experience. It helped students to synthesize the experience of their professional apprenticeship when it was tied to both to a non-classroom based experience and an academic class that they knew was required for graduation. As Eagle Rock instructor John Guffey noted in his written survey response:

Students enjoy the internship experience but are often distracted and less excited by efforts to build in academic outcomes and structure within or alongside of the hands-on experiences. Connecting an internship or experiential outcome to our Leadership for Justice power standard has been a great way to bridge these two important components (hands-on and academic).

Wilderness Education

The final instructional method studied was wilderness education. The researcher analyzed the data on wilderness education at the four schools in regards to the criteria of student engagement, civic engagement, and requirements for graduation. The following section has outlined an overview of wilderness education at the four schools,

followed by analysis of the data regarding student engagement, civic engagement, and requirements for graduation.

Overview of wilderness education at the four schools. Eagle Rock School required all incoming students to complete a 25-day wilderness orientation course in their first trimester at the school. This orientation course set up expectations for students that regarded appropriate behavior, overcoming adversity in pursuit of one's goals, and proactive steps to conflict resolution in a small community through facilitated conversation. The course was run in different habitats according to the season, and generally led by outside wilderness staff. The wilderness staff and trips were overseen by the Outdoor Education Instructional Specialist, Jesse Beightol, who led wilderness trips for seven years as a contract course teacher and remained on call to visit the trips in the field at any time. Wilderness faculty were well represented in the non-wilderness departments of Eagle Rock. The current Head of School, Jeff Liddle, started his employment at Eagle Rock as the wilderness trip coordinator for five years. The Human Performance Instructional Specialist, Jon Anderson – who coordinated internships with Rocky Mountain National Park – also led longer wilderness trips in the past and continued to lead week-long wilderness trips as part of the courses he taught. Optional wilderness experiences were offered for veteran students at Eagle Rock during Explore Week, in the middle of every trimester, which were popular among students; there were 15 applicants for 8 positions on the backcountry ski trip for the Explore Week trip in the spring trimester 2014. Some academic courses at Eagle Rock also included adventure experiences, such as the Geology class that incorporated rock climbing, or the Winter Ecology class that incorporated telemark skiing. Environmental topics and immersion

experiences in nature were also provided through the Citizen Science classes, run by Science Instructional Specialist Janet Johnson, which involved Eagle Rock students in active research studies on such topics as bird or dragonfly populations at Rocky Mountain National Park (RMNP).

The other three schools in the research study offered optional trips that immersed students in nature with faculty members in scenarios of choice. LACS offered annual week-long trips led by faculty members, which included bicycling or rafting or canoeing, for example. Harmony School had an annual high school trip that included an outdoor component. Science classes also included experiences in nature, such as the Botany class that engaged in gardening and forestry programs at a local restoration site. Windsor House School offered an outdoor trip every month or two, often held on Fridays, to local mountains or cabins and high or low ropes courses. Windsor House sometimes extended trips for more extensive activities (e.g., sea kayaking, backcountry skiing, or snowshoeing). The entire high school also took an annual trip together, which sometimes was of an outdoor nature, such as this year's planned sea kayaking adventure. The Windsor House High School Science teacher, Ellen Murphy, also included 'adventure courses' into some Science classes in the past, such as teambuilding in physics class (personal communication, Feb. 2014).

Three of the four schools facilitated multi-day experiences of this nature, with the fourth school offering annual day trips. In addition to the trip programs, the academic classes that incorporate outdoor experiences into the curriculum offer an invaluable way to connect with different learning styles. All four schools offered some classes, particularly science classes, which get students into nature while encouraging

environmental stewardship. LACS specifically offered an ecology class, which explored environmental issues such as climate change.

As discussed in the literature review, the definition of wilderness education may be broadened to include all realms of outdoor education, when regarded in terms of immersing students in nature. In regards to other kinds of outdoor education beyond wilderness trips, Eagle Rock and Harmony schools offered courses that went outside into the garden. LACS shut down their former school garden due to a lack of staff time and school construction. However, this school did offer local farm work as an optional service learning placement. Harmony had a gardening and grounds keeping course that was overseen by the Botany class in coordination with the teacher who headed both the Green and the Grounds committees. The Botany class also worked in local forest restoration, supported by partnerships with a local permaculture designer and with Indiana University's Bloomington Urban Woodlands Project. Out of the four schools, Harmony had the only active garden program on site, which was used in a course at the school, although the Eagle Rock campus did have a glass-roofed greenhouse attached to the science building, where there were some small gardening efforts. Previous extracurricular garden attempts at Eagle Rock by teacher John Guffey, who was also the service learning coordinator, were challenged by his lack of available time after teaching a full course load. Guffey reported that he had enthusiasm, yet lacked any specialized skill in gardening, and would have needed help or more training in order to have participated more effectively in the school garden.

Student engagement in wilderness education. In the optional courses and trips offered at three of the four schools, staff reported that students seemed engaged, students

rated the trips highly, and students made remarks about how they looked forward to their trips (Beightol, personal communication, February 2014). Teachers who involved their classes in outdoor education reported higher engagement levels. As Eagle Rock Service Learning Instructional Specialist John Guffey explained in his written survey, “I have found a reduction in stress and a shifting of the entire energy of the class when we take the learning outdoors and place it in a natural environment.” Eagle Rock faculty members Jesse Beightol and Jon Anderson as well as Windsor House teacher Ellen Murphy noted that the wilderness trips were popular among students, – as evidenced by waiting lists and student engagement in planning meetings. Faculty conjectured that this popularity was due to several factors. One factor was the students’ high degree of choice in the experiences they signed up for, another was their ability to help plan and prepare, and finally the removal of cell phone service eliminated some of the usual distractions to student engagement (personal communications, February 2014).

LACS teacher Chris Sperry described the wilderness trip that he led, back country canoeing in the Grand Canyon of Pennsylvania with 17 students, one other teacher, and a Youth Bureau representative. His account indicated that the removal of distraction, immersion in nature, and the risk involved were critical for student engagement:

We’re back country, five days, no cell phones, no civilization for most of those, carrying all the stuff that we need, setting new goals and showing kids how to make and cook on a fire for the first time, cooking in the woods with 11 year olds to 18 year olds. We do the Delaware if we can’t do the Pine. Pine Creek is the Grand Canyon of Pennsylvania, and the Delaware goes along roads. Pine Creek is roadless for three days. Deep [wilderness], and that’s unusual on the East Coast. It’s amazing. It’s level three rapids in one point, which is pretty high for beginning canoers. But, we make it through Owasi Falls and its got enough challenge that real failure is a possibility, which is important. The potential for failure is part of what

makes it work. And the motivational effort and energy put into it. (Sperry, personal communication, March 2014)

At Eagle Rock, all incoming students attended a 25-day wilderness course as part of their orientation to the school. Written student reports about the required 25-day wilderness course for school entrance showed varied degrees of enjoyment or engagement in the process – some students struggled on the trip, although they found it valuable for their growth. 75% of students responded yes on a survey, which indicated that, “It was hard in a good way, I learned skills and I could do it again.” 70% of surveyed students at Eagle Rock reported “less stress when we were out in nature,” and 67% reported that they “like being connected to nature.” These students indicated these benefits as reasons why they may continue to sign up for future wilderness experiences, even though they had experienced challenge on their initial wilderness trip.

In response to the teachers’ survey between all four schools, 80% of teachers responded that it was a benefit to the program that “student comfort zones were stretched by rigorous environments.” Sixty percent of responding teachers reported that student stress levels decreased in the time away from academics, and that quieter students expressed themselves in new environments. Teachers observed that quieter students spoke up in the wilderness environments, and in discussion these teachers implied that students were more engaged in wilderness settings, potentially because of their decrease in stress levels. The researcher observed as Windsor House high schoolers planned for an outdoor-focused senior trip which involved sea kayaking. Their meeting involvement indicated engagement in the planning process, and their teacher, Windsor House science teacher Ellen Murphy, noted that the students preferred the wilderness option to other

more culturally-based choices. This had not always been the case, and Murphy noted an increase in popularity for the wilderness trips that the school offered in general over the past several years. The trips at Windsor House were optional, and some involved parents in the planning and some parents participated in the trips (personal communication, February 2014).

Some of the course offerings at Eagle Rock School incorporated the wilderness theme into their academic studies (Liddle, personal communication, February 2014). Some academic courses at Eagle Rock also included adventure experiences, such as the Geology class that incorporated rock climbing, or the Winter Ecology class that incorporated telemark skiing (Frickey, personal communication, February 2014). Environmental topics and immersion in nature were also provided through the Citizen Science classes, run by Science Instructional Specialist Janet Johnson, which involved Eagle Rock students in active research studies on such topics as bird or dragonfly populations at Rocky Mountain National Park (RMNP) (Anderson, personal communication, February 2014).

Optional week-long wilderness experiences were offered for veteran students at Eagle Rock during Explore Week, in the middle of every trimester. While some students have graduated without attending any further wilderness experiences after the orientation course, many trips were offered which were popular among many students. There were 15 applicants for 8 positions on the backcountry ski trip for the upcoming Explore Week trip in the spring trimester (Anderson, personal communication, February 2014). These trips involved a high amount of student choice, which has been reported to lead to higher student engagement. “During Explore Week they can choose from all these

different experiences. In the summer we'll do a rock-climbing trip, a Green River canoe trip" (Beightol, personal communication, February 2014). The fact that the students had many options to choose from increased the potential for a high level of student engagement in the option they chose.

Civic engagement and wilderness education. In regards to wilderness education and civic engagement, wilderness experiences that the researcher studied sometimes involved professional guides on the trips alongside students, and students on trips did occasionally encounter recreational users of the outdoors. The interaction with professionals and recreational users did have an impact on some students regarding future career options, as cited by one Eagle Rock student survey respondent who reported, "It opened my eyes to the possibility of being an outdoor education specialist." However, the emphasis on civic skills was high in wilderness experiences as regarded the practice of conflict resolution. Students learned about group dynamics, and trips involved groups of students and staff and high levels of communication within the trip group. These trips involved group problem-solving, facilitation, and leadership skills. As noted by the Eagle Rock Head of School and former Outdoor Education Director, Jeff Liddle:

On wilderness if something comes up you stop, have a circle, and deal with it. We've been doing that for years. Back here, if something comes up, it's sort of brushed through so you get through whatever you're doing, teaching your class, so we don't stop and really address those things... We teach them 'I Statements,' we teach them talking circles, and we teach them how to communicate. (Liddle, personal communication, February 2014)

Eagle Rock's 25-day wilderness course included intentional curriculum about conflict resolution and transference of grit and resilience from the wilderness into the

school setting, which was designed in part to help students succeed at Eagle Rock who would not have completed graduation at their previous high schools.

It's definitely a wilderness expedition, so it has that component, but it's framed around, 'We're going to get through this together, we're not going to give up on anyone.' And through that we talk about - at school when this happens, how are you going to deal with it. At school when you have a teacher that you don't like, how are you going to stay engaged and not quit (Beightol, personal communication, February 2014).

Students on the Eagle Rock wilderness trip reported some success with implementation of the trip's emphasis on communication and social skills. 67% of surveyed students reported that they "got to be friends with students I wouldn't have normally talked to in school," and 50% reported that the trip "helped me break some bad habits." Data from teachers seemed to correlate with this information. 80% of surveyed teachers at all four schools reported that students bonded across normal clique boundaries during wilderness education. Teacher/student relationships also seemed to be forged on the wilderness trips. 60% of surveyed teachers from all four schools reported that "struggling students turned to staff members, creating lasting trust" during wilderness education. Eagle Rock teacher Jon Anderson reported that the bonds made on wilderness trips increased the connection that he experienced with these students throughout their careers at the school (personal communication, February 2014). There was still room for improvement in group dynamics on the trips, as 67% of surveyed Eagle Rock students reported that "students formed exclusive little groups on the trip, some people felt left out."

Wilderness education requirements for graduation. In regards to wilderness education requirements for graduation, only Eagle Rock School required their entrance

wilderness trip of all students. This orientation trip was the only required wilderness component at any of the schools, because no further wilderness experiences were required at Eagle Rock, although many were offered in trips or in courses. “If they're involved in the national park internship program that we have, then they do have to go on a national park trip that they have - that's part of the deal” (Beightol, personal communication, February 2014). The emphasis on these wilderness trips associated with courses was more academic in nature than social, which distinguished these courses from the orientation course.

Sometimes we have trimester-long classes that also have an outdoor component to it, like our Colorado Rocks class will have a four day sleepover experience, where we go rock-climbing somewhere else just to get them out of here. So that will be more of an academic focused trip - the personal growth stuff definitely comes up, but it's not as much as the wilderness trip (Beightol, personal communication, February 2014).

Notably, the Eagle Rock Head of School reflected about how the students questioned whether the wilderness components of academic courses had adequately prepared them for college:

You create a class like Colorado Rocks, which is rock climbing, geology, literature, environmental science; they're super engaged in it. They talk about it, they're into it. And then they'll turn around and say, ‘all my high school has me do is hang around rock climbing, and that's supposed to prepare me for college?’ They don't understand the nuances of it. They think about Colorado Rocks as a rock climbing class. Which is actually great, because they [also] learn math, science, geology, they've learned all this stuff. Students [say], 'Oh man, we're rock climbing and I hear that other people are sitting in classrooms, and they're getting into college so I'm freaking out.’ (Liddle, personal communication, February 2014)

Although they did not offer trips that were explicitly required for graduation, both Harmony and LACS offered wilderness trips coordinated with groups of students and staff. Windsor House conducted an annual high school trip – which the researcher

observed being planned as an outdoor trip – and smaller optional trips in which the Science teacher involved parents. The researcher observed planning meetings for outdoor trips at all of these schools, which involved students and were scheduled in spring. At two of the schools there were ‘trips weeks’ where all students signed up for a wilderness trip of their choice. Although they may not have been required for graduation, attendance levels were high based on the number of students and teachers who spoke of their excitement about upcoming trips. These trips clearly added wilderness education to the majority of students’ high school experiences at three of the four schools.

Within the broader definition of outdoor education mentioned earlier, LACS and Harmony schools both offer optional gardening or farm experiences, which can be used to fulfill graduation requirements at the school through academic courses or through the community service requirements of both schools. Notably, the researcher observed that farm and garden experiences at these schools are led by Science teachers, who incorporated such outdoor experiences into academic and social concerns related to science. At LACS, students presented this outdoor community service as part of their Graduation by Exhibition presentation and portfolio, which fulfilled their requirements for graduation (Raimon, personal communication, February 2014).

Discussion of the Findings

Four Emerging Themes in the Research

Through analysis of the data in this research study, a number of significant themes arose. First and foremost in the observations of the researcher and reports from participants were notes about the prominence of personal relationships. The practices at

these schools seemed to support human relationships because time, opportunity for discussion, and shared experiences were provided. The second major theme was the use of discussion-based formats as the central organizational pillar at each of the four schools. The all-school meetings supported and facilitated individual relationships, provided a foundation for the democratic and participatory processes to engage both the students and the staff, and a ready forum in which to explore and encourage student agency and conflict resolution. The efficiency and the scope of these all-school meetings were increased by additional, smaller group discussion meetings among faculty, committees of like-minded students and staff, and topic-specific group discussions aimed at resolving current conflicts.

A third important theme that arose in the analysis of the data was the dynamic tension between alternative and traditional methods of education. While each of the four schools was founded upon some variation of alternative methods and philosophies of education, each school had an ongoing relationship with more traditional methodologies of education which entered the space via the prior experiences and perspectives of the faculty, the requests of the students to demonstrate academic competency to an external standard, and/or the external pressures of governmental regulations. Each school employed multiple avenues for presenting information, engaging students, and assessing student learning in ways that responded to a range of learning styles while also meeting a variety of school objectives, reflecting the tension between the dual goals of sensitivity and support of individual students' experience and rigorous response to the expectations of the state.

The fourth theme observed by the researcher was of the authentic performance-based assessment that arose at each school based on individual student experiences within the frame of the school's learning objectives and instructional methods. The exhibited results of student learning were primarily visible as informal processes within the relevant contexts of service learning, professional apprenticeships, and wilderness education as supported by close relationships with staff, and secondarily within the discussion-based structures of the schools, which also provided opportunities for students to give formal presentations about their learning experiences.

Facilitating human relationships. As evidenced in all sources of data – in the student and faculty survey responses, in faculty and student interviews, and in observations at each of the four schools, human relationships were an emphasis and a primary asset of the schools as cited by all parties. Each of the school practices studied in this research – all-school meetings, faculty mentorships, individualized pathways to graduation, service learning, professional apprenticeships, and wilderness education – were shown to clearly facilitate connections between people in the school community in different ways. All-school meetings provided an opportunity for students and faculty to foster relationships through discussion about issues that individuals cared about, shared experiences of conflict resolution, and celebrations of milestones in the community. Further discussion-based meetings afforded the members of the school community the opportunity and time to support personal relationships. The emphasis that these schools placed upon personal relationships seemed to allow them the instructional flexibility and adaptability for individuals that was particularly noted as an asset in pursuing the goals of environmental education as per the research of Saylan and Blumstein (2011).

Close personal relationships were further fostered by ongoing relationships between individual students with their faculty advisors, as well as between students within the same advisory group. The prioritization of agency and choice as a valuable aspect of students' individualized pathways to graduation required that faculty members got to know each students' preferences and career goals in order to assist them as they designed their high school program. The methods of service learning, professional apprenticeships, and wilderness education created further opportunities at each participating school for students to foster relationships with each other, with teachers, and with professional mentors in a non-classroom setting. In each of these six school practices, the relationships fostered outside the classroom translated into closer relationships in the classroom as well.

Discussion-based meetings as a central organizational theme. Each of the four schools featured an all-school meeting on at least a weekly basis. Other discussion-based meetings, in addition to the all-school meetings at each of the schools, furthered relationships between individual staff and students. At three of the four schools these all-school meetings involved students in consequential decision-making processes regarding school policies, while in all four of the schools these meetings involved the gathering and consideration of student voice. Additional discussion-based meetings at each school involved staff and students in committees for discussions on issues of mutual interest. In each of the schools one of these committees addressed conflict resolution, while other committees addressed special interests such as specific extracurricular activities or school policies. Through the emphasis on discussion-based meetings, these schools were able to create and implement new projects that addressed the specific needs of each school's

community and environment, an important aim of service learning and project-based education as discussed by Sobel (2009).

Additionally, each of the four schools instituted discussion in faculty advisory groups between students and a faculty mentor. These groups facilitated the students' progress along their individualized pathways to graduation, and supported students around personal issues, conflict resolution, upcoming events, and social activities. Each of the four schools also involved staff members in staff meetings on a weekly basis, which included discussions of how to best support students, upcoming events, and professional development. Further, the precedent of discussion as the method of relating at each of the schools was also the predominant practice within the classroom setting, with discussions and workshop formats observed and reported as much more common than a more traditional lecture format. When surveyed, school administration did not emphasize discussion as the primary philosophy of two of the schools, yet research analysis suggested that discussion-based, participatory meetings were a primary organizational structure and a pillar of democratic practice around which all four of the schools were organized. These discussions allowed staff and students to foster the close relationships, which all parties remarked were the greatest strength of the schools.

Dynamic tensions between alternative and traditional methods of education.

While each of the four schools in the study was founded on a premise of alternative educational philosophies, and each of the schools maintained tenets of their original philosophy 20-40 years into their operation, there was a common theme at all four schools of tension between alternative and traditional educational practice. Three sources for the drift towards traditional education were noted: external standardization pressures

from the provincial, district, or board requirements; internal pressure from teachers who were successful in and therefore more familiar with more traditional methods of education; and internal requests from concerned students who wished to be prepared for college in traditional ways. While unintentional drifting towards traditional education methods could have compromised the mission and philosophy of the school, each school had examples of when they adjusted practices to reconcile with the alternative philosophies of origin. It is worthwhile to note the intentional uses of traditional educational methods to further the alternative philosophies at the core of each of the schools.

Notably, the teachers at the schools who were most lauded by students and colleagues alike for their excellence all taught with an intentionally varied array of educational practices in every class. While the students of these teachers were attending service learning and internships, writing reflective essays on wilderness experiences, or conducting oral debates in historical character, they were also taking more traditional multiple choice tests, answering essay questions, taking pop quizzes, having small group discussions, and writing research papers. The teachers who were noted as exemplary sought and created a variety of ways for the students to demonstrate their intelligence, mastery, and critical thinking skills. These findings pointed to the fact that even in primarily alternative settings, it was valuable to offer diverse teaching strategies for diverse learners as per the “universal design” model, multiple modes of content presentation, multiple means of engaging students in learning, and multiple means of assessment are offered (Orlich et al., 2013).

These teachers also spoke about the variety in methods with their students, noting that they were preparing them to participate in traditional educational methods, while they simultaneously proposed that the alternative means of instruction and assessment they employed in other moments were equally valid. While each school had a variety of assessment methods within individual classes, there was an emphasis on presentational assessments in three of the four schools and on spoken evaluations with advisors in conferences at all four of the schools. These findings reflected the importance of discussion and relationships, and led the researcher to the following conclusions about the development of authentic performance-based assessment.

Authentic performance-based assessment. Due to the emphasis on discussion and personal relationships between students and faculty at all four of the schools, the faculty seemed to have specific and up-to-date knowledge of the performance of their students, despite the fact that the students were often engaged in independent and out-of-classroom work. The relationships of students and teachers were the primary source of academic evaluations, with all four of the schools conducting conferences at regular intervals that included each student and their parents in a performance review. While some of the schools used traditional letter grades, students who were asked how they were doing generally did not mention their grades. This seemed to reflect grades' relative lack of value within the system of the school. Rather, students who were inclined to respond remarked on the specific aspects of their work that were either going well or were in need of improvement based on their teachers' assessment in their conferences, or with other commentary on their apprenticeships, service learning placements, and other projects. Similarly, when teachers were asked how their students were doing, they did not

comment on their grades or test scores. They instead spoke in detail about their students' relationships with their professional mentors, their engagement in their apprenticeship or service learning placements, their preparations for their upcoming projects or presentation, or their fervent engagement in discussions in committees or at all-school meetings.

In the field on wilderness trips, in the workplace in apprenticeships, and in service learning settings, the students received on-the-ground feedback from mentors and fellow students regarding their performance and their behavior. In three of the four schools, teachers coached the students to present their learning in exhibition format. The result of these presentations seemed to be an ongoing, authentic performance-based assessment process that was specific to each educational situation and tailored to the individual student's goals and potential career placements. The focus on experiential education, combined with the emphasis on discussion, effectively allowed for teachers to conduct continual and casual "think on their feet" oral assessments of student learning, which Singh (2011) has been shown to be an effective means of assessment in environmental education.

CHAPTER IV

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

In response to a global need for environmental education and a local need for a new high school, the researcher studied established alternative high schools, and designed a new environmental high school with similar instructional methods. The researcher focused on six features of school design, and conducted research through internet-based surveys as well as on-site observations and interviews with administration, teachers, and students at four high schools. Three organizational structures and three instructional methods were studied: all-school meetings, faculty advisory groups, individualized pathways to graduation, service learning, professional apprenticeships, and wilderness education. The researcher studied strengths and challenges associated with these practices at the four schools, and analyzed data using grounded theory to find common themes and patterns.

The researcher investigated two questions: First, what are the organizational structures, instructional methods, and assessment approaches used at established alternative high schools? Second, how could the lessons learned from these educational structures be implemented in the generation of a new environmental high school design? When the first question was addressed, grounded theory analysis revealed four emergent

themes in the research from the four schools: an emphasis on human relationships, discussion as a central organizational principle, a dynamic tension between traditional and alternative methods of education, and authentic performance-based assessment. To address the second question, these four themes were used to create the recommended practices and organizational structures of the instructional guide for Earth Arts, a new environmental high school grounded in research on and experiences with effective practices in alternative and environmental education.

The culmination of this thesis project was a creative proposal: the instructional design of a new environmental high school, included in Appendix A. The four themes described above, which were revealed in the research analysis, were utilized to generate recommendations for the instructional design pedagogy for a new environmental high school, Earth Arts Academy. The goal for this instructional design was to create a model that was foundational enough to be replicable, yet flexible enough to be adaptable to various communities. This framework was designed to incorporate the recommended organizational structures and instructional methods via the design metaphor of a tree, which was intended to highlight the environmental theme of the school as well as the tree as a symbol of education. In addition to the research findings, the school design project was also informed by the researcher's observations and experiences from ten years in environmental education, as well as brainstorming sessions with local families who were interested in participating in Earth Arts. Detailed design recommendations for the new environmental high school that has been based on this research are included in the introduction to the project in Appendix A.

The new school design for Earth Arts Academy was presented for the first time to the researcher's colleagues and local parents for feedback and review prior to the final version of this project. The researcher has begun work towards the creation of a teen leadership and mentorship pilot program, which planned to meet in person and online for instruction via correspondence. It has been intended in its initial design that this pilot program may grow over time into the full vision of the high school, if it generated significant community support. The final recommendations section has addressed areas for further research that have been illuminated by this project, outside of the scope of designing a new school.

Conclusions for the Project

Research analysis led the researcher to significant recommendations regarding organizational structures and instructional methods in school design. These recommendations were incorporated into a pedagogical proposal for a new interdisciplinary environmental high school based upon the data from this study (see Appendix A). The research findings constructed the researched schools' philosophical foundations as well as some potential practices that exemplified these approaches in course design, assessment, and graduation requirements. General considerations regarding the required credits for high school courses were considered, as well as the alternative daily and calendar year schedules at the researched schools. Alternative scheduling allowed for time and structure to support the philosophical foundation of the schools, and ensured the possibility for equivalency in high school accreditation. The facilities, scheduling, and pathways of students through the requirements for graduation

were an intrinsic part of the new school design, as it was apparent to the researcher that these structures were essential tools to deliver the philosophical ideals of each researched school.

As per the themes that emerged in research analysis, the researcher made an instructional school design project that facilitated human relationships, placed an emphasis on discussion, utilized a diversity of alternative and traditional teaching methods, and implemented authentic performance-based assessment. The primary conclusion of the researcher was to create a school design that promoted and supported connections between people: between students and teachers, students and mentors, students with each other, and faculty with each other.

Through emphasis on a strong foundation of support between people, the new school design endeavored to create stronger relationships between people and the environment, as per the recommendation of Orr (2005, 2012). The researcher concluded that supportive relationships between people were paramount, as Saylan and Blumstein (2011) and Sobel (2004) found that teachers required significant support to integrate EE into their courses. The new school design has been intended to create the support structures needed to create site-specific projects, facilitate apprenticeships and service learning, and develop alternative methods of assessment.

A foundational emphasis on human relationships was a primary asset cited at each of the four researched schools, and the researcher found that each school had specific practices that supported school community members with time and the context that they needed to facilitate these connections. The second conclusive theme from the research was to design the dendritic pedagogy with discussion-based meetings as a

central organizational structure. All-school meetings were indicated as the central organizational theme for Earth Arts. The school was designed with multiple meetings per week. This included shorter meetings in which smaller discussions and announcements were addressed, and allowed one main all-school meeting per week for addressing in-depth questions, as per the format used at three of the four schools with all-school meetings. Of particular note was that all four of the schools had a weekly staff meeting, which the researcher concluded was of import to facilitate conversation, professional development, and collaboration between teachers. Weekly staff meetings supported the kind of intensive staff collaboration that is necessary to implement interdisciplinary courses led by multiple teachers, as well as the development of innovations to address unique opportunities for environmental education projects of relevance to the community, as recommended by Saylan and Blumstein (2011).

Third, in order to adapt to unique situations, needs, and skills among the school population of students and teachers, the Earth Arts design encouraged a dynamic tension between alternative and traditional educational practices. As per the recommendations of administration at the schools, teachers had agency to create courses that meet the needs and opportunities present in their community. As per the research of Janssen and Crauwels (2011), it was demonstrated that multiple choice tests could be effective in measuring a student's knowledge acquisition in EE. As noted in the literature review, students at Environmental Charter High School (ECHS) in LA have likewise utilized a variety of methods and technologies to engage in all the aspects of environmental projects in their schooling (Grayson, 2011). Earth Arts was designed to

incorporate traditional and alternative assessments and courses have been planned to include the wise use of technology.

Although alternative methods of instruction and assessment were emphasized in all the schools researched, multiple veteran teachers at the schools recommended mixing in traditional methods such as multiple choice tests. Teachers offered that this recommendation was in order for both teachers and students to remain adaptable, and for students to test their skills in a traditional environment within their comfort zone of a more experiential educational philosophy. However, the researcher concluded that authentic performance-based assessment was the primary method of assessment used at the researched schools, and was especially used for experiential educational methods such as service learning and apprenticeships. Therefore, a presentational method of assessment was emphasized in the design for Earth Arts. The presentational method was woven into the central structure of the all-school meeting as well as the instructional methods of Earth Arts' seminar courses. This mode of assessment was consistent with the research of Saylan and Blumstein (2011) and Singh (2011), which determined that oral assessment was an effective means of testing for the comprehension of topics, and that presentational assessment inspired the translation of knowledge into action which is imperative in environmental education.

Recommendations for Further Research

Recommendations for further research beyond this study include following up on references to other schools of interest. Most notable and frequent among these recommendations are the Big Picture Schools, which the researcher would like to visit in

order to learn from their extensive emphasis on their apprenticeship program. Additional research is recommended on the instructional methods and organizational structures studied. Recommendations include pursuing practices that were noted at these schools, and potentially visiting other schools that practice similar methods with different techniques. In particular, it is recommended that the researcher investigate additional examples of long-term wilderness education, which was only present at one of the schools in the research study.

Finally, significant factors were noted during the study about the operation of a high school, which were outside of the scope of this study yet are recommendations to be investigated prior to launching Earth Arts. Some of these factors are considered in researcher's generation of the dendritic design, although they require further research before implementation. These themes include the role of technology, the role of discipline, and the role of entrepreneurship in the high school students' education. Specific practices were observed at each of the schools in regards to discipline, entrepreneurship, and technology, and these factors were incorporated into the Earth Arts design and schedule. The schools in the study each had well-developed philosophies and systems of non-coercive discipline which the researcher has included in the Earth Arts design. As the four researched schools in the study did not emphasize technology use, and this is an area of interest for the proposed school population, it is recommended that other schools are sought to investigate models that incorporate technology and student entrepreneurship to a larger degree within the high school context. The schedule and credit system itself was noted at the various schools, and proved a valuable tool in the correlation of required courses in high school graduation plans into a feasible high school

schedule given the course offerings. Additional high school schedules are recommended for further research.

Further areas for research that are outside the scope of this study include school financing, high school accreditation, and the creation of a performance-based assessment waiver for standardized testing. Recruitment, enrollment, and hiring are further areas that will need elaboration and research prior to launching the school design, as well as facilities, grounds, and the school lunch plan. The final recommendation for further investigation beyond the scope of this study is regarding higher level academic environmental science education. Science education is heavily emphasized as a pillar of the Earth Arts design, however this was not a strong emphasis at any of the four schools in the study, with the exception of the ecology class at LACS and the botany class at Harmony. It is recommended that the researcher investigate further schools with this environmental science emphasis, and that a design partner is found who specializes in science education to develop this aspect of the dendritic pedagogy.

In conclusion, the final recommendation for this thesis project is for the researcher to present this dendritic pedagogical design to mentors, colleagues, and potential school parents in order to gather feedback and attract potential collaborators to refine the design. Each of the four schools in the research study has requested a copy of this thesis project, and the researcher has maintained contact with faculty members at each of the schools. One of the next steps for this project is to ask these alternative education professionals to be mentors to this project as it emerges, and to ask for their feedback upon review of the Earth Arts instructional design framework. The researcher anticipates feedback regarding feasibility of independent studies and service placements,

the timing of faculty mentorship conferences and meetings, and questions about the role of technology and online learning versus hands-on experience. Fundraising is also a subject for future development.

Launching the Earth Arts Academy will be a community endeavor that takes time, creativity, and collaboration. The following project has been created as an offering toward the field of environmental education reform. This project is a pedagogical design intended to have a solid enough foundation to be replicable in multiple settings, and yet a flexible enough structure to be tailored to the individual students, teachers, and collaborators who make it a reality in their unique communities. The researcher recommends that this project first be launched utilizing key design elements in a smaller pilot program. This program would emphasize personalized mentorship and monthly discussion-based workshops along with service learning and wilderness experiences in a limited capacity as a non-profit educational vendor. Pending sufficient community interest, student participation, and collaborative instructor engagement for the school to thrive, the researcher recommends the launching of the full high school pedagogy in the near future. Earth Arts is presented here in Appendix A as a well-researched endeavor to facilitate a change of direction for environmental education which engages all citizens in the endeavor for human survival and a healthy planet.

REFERENCES

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- Barkand, J., & Kush, J. (2009). GEARS a 3D virtual learning environment and virtual social and educational world used in online secondary schools. *Electronic Journal of e-Learning*, 7(3), 215-224.
- Bartosh, O., Tudor, M., Ferguson, L., & Taylor, C. (2009). Impact of environment-based teaching on student achievement: A study of Washington State middle schools. *Middle Grades Research Journal*, 4(4), 1-16.
- Battisoni, R. M., Longo, N. V., & Jayanandhan, S. R., (2009). Acting locally in a flat world: Global citizenship and the democratic practice of service-learning. *Journal of Higher Education Outreach and Engagement*, 13(2), 89-108.
- Bristol, C., Knapp, T., & Fisher, B. (2010). The effectiveness of service learning: It's not always what you think. *Journal of Experiential Education*, 33(3), 208-224.
- Bruce, H. E. (2011). Green(ing) English: Voices howling in the wilderness. *English Journal*, 100(3), 12-26.
- California State University, Chico. (2013). *Definition of service learning*. Retrieved from www.csuchico.edu
- Capra, F. (2005). Preface. In Stone, M. K. & Barlow, Z. (Ed.), *Ecological literacy: Educating our children sustainable world*. Berkeley, CA: University of California Press.

- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. Thousand Oaks, CA: Sage Publications, Inc.
- Christman, S. (2012). Preparing for success through apprenticeship. *Technology and Engineering Teacher*, 72(1), 22-28.
- Cole, A. (2007). Expanding the field: Revisiting environmental education principles through multidisciplinary frameworks. *Journal of Environmental Education*, 38(2), 35-45.
- Creswell, J. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage Publications, Inc.
- Daskolia, M., Dimos, A., & Kamylyis, P. G. (2012). Secondary teachers' conceptions of creative thinking within the context of environmental education. *International Journal of Environmental & Science Education*. 7(2), 269-290.
- Doblar, D. D. (2009). Ten schools and school districts to get excited about. *Educational Horizons*, 87(2), 116-127. Retrieved from ERIC database. (EJ826482)
- Dresner, S. (2002). *The principles of sustainability*. London, UK: Earthscan.
- ECHS Lawndale. (2015). *Our schools*. Environmental Charter High School, Environmental Engagement section. Retrieved from <http://echslawndale.org/our-schools/>
- Environmental Charter High School (ECHS). (2011). Retrieved from <http://echsonline.org/academic-life.cfm/id/extended-learning#communityservice>
- Environmental Charter Schools. (2015). Retrieved from: <http://ecsonline.org/our-approach/community-partners/>

- Eyler, J. (2009). The power of experiential education. *Liberal Education*, 95(4).
Retrieved from https://www.aacu.org/liberaleducation/le-fa09/le-fa09_Eyler.cfm
- Foster, J. S., & Shiel-Rolle, N. (2011). Building scientific literacy through summer science camps: A strategy for design, implementation and assessment. *Science Education International*. 22(2), 85-98.
- Furco, A. (2002). Is service-learning really better than community service? A study of high school service program outcomes. In A. Furco & S.H. Billig (Eds.), *Service-learning: The essence of the pedagogy*. Information Age Publishing, Greenwich, CT.
- Gardner, H. (1993). *Multiple intelligences*. New York, NY: Basic Books.
- Giroux, H. A., & Penna, A. N. (1979). Social education in the classroom: The dynamics of the hidden curriculum. *Theory and Research in Social Education*. 7(1), 21-42.
- Gordon, D. (2011, Mar 7). Return to sender. *Transforming Technology Through Education Journal*. Retrieved from:
<http://thejournal.com/Articles/2011/03/07/Return-to-Sender>
- Gordon, D. E. (2010). Green schools as high performance learning facilities. *National Clearinghouse for Educational Facilities*.
- Grayson, J. (2011). Charting a green course. *T.H.E. Journal*, 38(4), 26-28, 30-31
Retrieved from ERIC database. (EJ922305)
- Harmony High School. (2015). Retrieved from
<http://www.harmonyschool.org/programs/high-school>

- Hendrix, C. S. & Salehyan, I. (2012). Climate change, rainfall, and social conflict in Africa. *Journal of Peace Research*. 49(1), 35-50.
doi: 10.1177/0022343311426165
- Horn, M. B. (2013, Sum). The transformational potential of flipped classrooms: different strokes for different strokes. *Education Next*. 13(3).
- Huerte, L.A. & d'Entremont, C. (2010). Charter school finance: Seeking institutional legitimacy Lubienski, C. A., Weitzel, P. C. (Eds.). *The charter school experiment: Expectations, evidence, and implications*. (pp. 121-146).
Cambridge, MA: Harvard Education Press.
- Hugo, G.; Bardsley, D. K. (2014). Migration and environmental change in Asia. In E. Piguet, E. Laczko, F. (Eds.), *People on the move in a changing climate: The regional impact of environmental change on migration*, (p. 2). Online:
Springer Link Publishing.
- Huntington, H., Goodstein, E., & Euskirchen, E. (2012). Towards a tipping point in responding to change: rising costs, fewer options for arctic and global societies. *AMBIO - A Journal of the Human Environment*. 41(1), 66-74.
- Hutchings, J. A., & Reynolds, J. D. (2004). Marine fish population collapses: Consequences for recovery and extinction risk. *BioScience*. 54(4), 297-309.
doi: 10.1641/0006-3568(2004)054[0297:MFPCCF]2
- Ilich, I. (1970). *Deschooling society*. London, England: Calder and Boyars.

- IPCC. (2014). *Climate change 2014: Synthesis report*. Contribution of Working Groups I, II, and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. [Core writing team, R. K. Pachauri and L.A. Meyer (eds.)] Geneva, Switzerland.
- ISTE.Nets.s: Advancing Digital Age Teaching. (2015). *The International Society for Technology in Education. Standards for teachers*. Retrieved from:
<http://www.iste.org/standards/iste-standards/standards-for-teachers>
- Jacobs, H. H. (Ed). (1989). *Interdisciplinary curriculum: Design and implementation*. Association for Supervision and Curriculum Development. Retrieved from ERIC database. (ED316506)
- Kats, G. A., Braman, J., & James, M. (2010). *Greening our built world: Costs, benefits, and strategies*. Island Press. Washington, DC.
- Kotar, M. (2012). EDCI 602: Assessment and evaluation of learning course supplement. Pearson Learning Solutions. Boston, MA.
- Kronholz, J. (2011, Fall). Getting at-risk teens to graduation: Blended learning offers a second chance. *Education Next*. 11(4). Retrieved from
<http://educationnext.org/getting-at-risk-teens-to-graduation/>
- Kronholz, J. (2012). Can Khan move the Bell curve to the right? Math instruction goes viral. *Education Next*, 12(2), 16-22.
- Kumler, L. M. (2011). Students of action? A comparative investigation of secondary science and social studies students' action repertoires in a land use context. *Journal of Environmental Education*, 42(1), 14-29.

LACS. Lehman Alternative Community School. (n.d.). Website. Retrieved from:

<http://www.icsd.k12.ny.us/lacs/>

Legault, L. & Pelletier, L. G. (2000). Impact of an environmental education program on students' and parents' attitudes, motivation, and behaviors. *Canadian Journal of Behavioral Science*. 32(4), 243-250.

Lenton, T. M., Held, H., Krieger, E., Hall, J. W., Lucht, W., Rahmstorf, S. & Schellnhuber, H. J. (2008). Tipping elements in the Earth's climate system. *Proceedings of The National Academy of Sciences of The United States of America*, 105(6), 1786-1793.

Lewin, T. (2010, Jan. 20). If your kids are awake, they're probably online. *New York Times: Education*. Retrieved from http://www.nytimes.com/2010/01/20/education/20wired.html?_r=2

Louv, R. (2005). *Last child in the woods: Saving our children from nature-deficit disorder*. Algonquin Books of Chapel Hill. Chapel Hill, NC.

Lubienski, C. A. & Weitzel, P. C. (2010). Grading charter schools: Access, innovation and competition. In Lubienski, C.A. & Weitzel, P.C. (Eds.). *The charter school experiment: Expectations, evidence, and implications*. Cambridge, MA: Harvard Education Press.

Meeth, L. R. (1978). Interdisciplinary studies: Integration of knowledge and experience. *Change* 10(7), 6-9. doi: 10.1080/00091383.1978.10569474

Mertens, D. M. (2010). *Research and evaluation in education and psychology: Integrating diversity with quantitative, qualitative, and mixed methods*. Thousand Oaks, CA: Sage Publications, Inc.

- Miron, G. (2010). Performance of charter schools and implications for policy makers. In Lubienski, C.A., Weitzel, P.C. (Eds.) *The charter school experiment: Expectations, evidence, and implications*. Cambridge, MA: Harvard Education Press.
- Misset, T. C., Reed, C. B., Scot, T. P., & Callahan, C. M. (2010). Describing learning in an advanced online case-based course in environmental science. *Journal of Advanced Academics*. 22(1), 10-50.
- Murphy, D. J., & Hall, C. S. (2011). Energy return on investment, peak oil, and the end of economic growth. In Costanza, R.; Limburg, K.; Kubiszewski, I. (Eds.) *Ecological economics reviews* (pp. 52-72). *Annals of New York Academy of Sciences*. 1219.
- Neill, J. (2007). *Wilderness and education: On the natural environment's role in education*. Retrieved from <http://www.wilderdom.com/Wilderness.html>
- Neumann, R. (2008). Charter schools and innovation: The high tech high model. *American Secondary Education*, 36(3), 51-69.
- November, A. (2010). *Empowering students with technology*. Corwin. Thousand Oaks, CA.
- Office of Education (DHEW). (1970). *Environmental education: Education that cannot wait*. Washington, DC. Retrieved from ERIC database. (045 492)
- Oppenheimer, T. (2002). The Flickering mind: saving education from the false promise of technology. *Random House*. Retrieved from: <http://www.randomhouse.com/book/124693/the-flickering-mind-by-todd-oppenheimer/9781400060443/#excerpt>

- Orlich, D. C., Harder, R. J., Callahan, R. C., Trevisan, M. S., Brown, A. H., & Miller, D. E. (2013). *Teaching strategies: A guide to effective instruction* (10th ed). Australia: Wadsworth Cengage Learning.
- Orr, D. W. (1992). *Ecological Literacy: Education and the Transition to a Postmodern World*. New York, NY: State University of New York Press.
- Orr, D. (2004) *Earth in mind: On education, environment, and the human prospect*. Washington, DC: Island Press.
- Paterson, J. (2010). Integrating environmental education. *Education Digest: Essential Readings Condensed for Quick Review*, 75(7), 38-42.
- Prensky, M. (2005, Dec/2006, Jan). Listen to the natives: Learning in the digital age. *Educational Leadership*, 63(4), 8-13.
- Prentiss, T. (2011, Apr). Buildings that conserve and educate. *T.H.E. Journal*, 38(4), 18-19.
- Sable, J., Plotts, C., & Mitchell, L. (2010). *Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 2008–09* (NCES 2011–301). Washington, DC: U.S. Department of Education, National Center for Education Statistics. <http://eric.ed.gov/?id=ED512593>
- Saylan, C., & Blumstein, D. T., (2011). *The failure of environmental education (And how we can fix it)*. Berkeley, CA: University of California Press.
- Schinkel, A. (2009). Justifying compulsory environmental education in liberal democracies. *Journal of Philosophy of Education*. 43(4), 507-526.
doi:10.1007/s11191-012-9493-1

- Singh, P. (2011). Developing a community of thinking: Assessment of environmental education. *Environmental Education Research*, 17(1), 113-123.
doi: 10.1080/13504622.2010.484881
- Sobel, D. (2004). *Place based education: Connecting classrooms & communities*. Great Barrington, MA: The Orion Society.
- Spake, A. (2008). *Building minds, minding buildings: Our union's road map to green and sustainable schools*. American Federation of Teachers. Retrieved from ERIC database. (ED511561)
- Stafford, S. G. (2010). Environmental science at the tipping point. *Bioscience*, 60(2), 94-95. doi: 10.1525/bio.2010.60.2.2
- Steele, A. (2011, Jan). Beyond contradiction: Exploring the work of secondary science teachers as they embed environmental education in curriculum. *International Journal of Environmental & Science Education*, 6(1), 1-22.
- Synergia Learning Ventures. (2011, Nov 28). *Finding the Good*. Retrieved from <http://www.findingthegood.org/>
- University of California Admissions. (2014). *Minimum admissions requirements*. Retrieved from <http://admission.universityofcalifornia.edu/counselors/freshman/minimum-requirements/>
- Wernick, L. (2005). *The media and technology charter high school*. DesignShare. Retrieved from <http://www.designshare.com/index.php/articles/media-and-technology-charter-high-school/>

- Woolman Semester. (2011, Nov, 25). *The Woolman Semester School: Progressive, experiential education*. Retrieved from <http://semester.woolman.org/>
- Wyner, Y., Becker, J., & Torff, B. (2014). Explicitly linking human impact to ecological function in secondary school classrooms. *The American Biology Teacher*. 76(8), 508-515. doi: <http://dx.doi.org/10.1525/abt.2014.76.8.4>
- Xu, D.; Li, C., Zhuang, D., & Pan. J. (2011). Assessment of the relative role of climate change and human activities in desertification: A review. *Journal of Geographical Sciences*. 21(5), 926-936.
- Zwally, H. J., Jun, L., Brenner, A.C., Beckley, M., Cornejo, H.G., Dimarzio, J. . . . Wang, W. (2011). Greenland ice sheet mass balance: distribution of increased mass loss with climate warming. *Journal of Glaciology*. 57(201), 88-102.

APPENDIX A

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THE INSTRUCTIONAL GUIDE FOR EARTH ARTS ACADEMY

Introduction

To address the need for solution-focused, relevant, and experiential environmental education at the high school level, the purpose of this project is to create the instructional guide for Earth Arts Academy (Earth Arts), a new interdisciplinary environmental high school model for students in Nevada City, California. This school design incorporates academic training and entrepreneurial mentorship into the context of environmental and social justice programming. This is accomplished with the techniques of academic service learning projects, artistic presentations to the public, apprenticeships in fields of sustainability, and adventures in nature with a rites of passage component. The dendritic pedagogical design proposed is based on analysis of peer-reviewed literature as well as original research at four alternative high schools utilizing the proposed educational techniques. Earth Arts Academy is designed to be site-specific in description, yet intended to be a pedagogical model that may be replicated in other locations. This Earth Arts model is meant to serve the discovery and implementation of broad scale human behavioral changes in respect to social and environmental justice, incorporating professionals in sustainability and environmental science into the education and lives of interested teenagers who are inheriting tomorrow's earth.

The intention of this project is to create an instructional framework to guide Earth Arts Academy with a solid foundation in educational philosophy. The foundational and philosophical framework creates enough detail in school design to be replicable, yet with enough flexibility to be adaptable to a variety of communities and contexts. This dynamic tension between framework and flexibility guided the researcher to craft the Earth Arts design with an emphasis on certain philosophical foundations, while including certain example practices shown to be in alignment with the execution of those philosophies in action at the researched schools.

The instructional design supports an emphasis on facilitating the four findings from the research: facilitating, human relationships, emphasizing discussion-based decision making, utilizing a diversity of alternative and traditional teaching methods, and developing authentic performance-based assessment. With these aims in mind, the researcher selected to emulate certain practices which exemplified these philosophies in each of the six features of school design that were studied at the four schools, as well as referencing peer-reviewed literature, and drawing from experience in the non-profit EE sector. The objective in naming these practices and examples from research within this Earth Arts design is not to create an exhaustive, required, or prescriptive set of practices. Rather, the objective of this project is to craft a dynamic and adaptable foundational structure to launch an alternative, interdisciplinary, environmental high school design that is open-ended in curriculum and responsive to the unique needs of each school's population and context. Embedded in the school design are structures through which the specific school practices may be revisited and adjusted to meet the needs of the school

community as discovered over time, while staying true to the philosophical foundations of the school.

This introduction includes descriptions of the four recommended themes that form the reasoning for the instructional design of the school, the intended student population, and their projected educational outcomes through participation in the school. The dendritic pedagogical school design for Earth Arts Academy is illustrated in Figure 1, with the instructional design outlined in the shape of a tree (see page 139). This project describes the symbolism of the tree as related to the site-specific educational elements of the school, as well as organizational structures, instructional practices, disciplines of study and service learning projects (SLPs), and individualized student pathways toward graduation (IPGs). The specific curricular content of the coursework is intentionally left open for the determination of individual teachers in the context of the school community, environmental opportunity, and student interests. The limitations of this project are such that financing, facilities, staff recruitment, student enrollment, and team sports are not included in this guide. This project concludes with Figure 2, the Earth Arts Academy Daily Schedule (see page 159), followed by descriptions of the daily, weekly, semester, and calendar year schedules, and the course credit requirements for the three pathways to graduation: Green Trade, Green College, and Green Tech.

Recommendations for the Earth Arts Academy

Facilitating human relationships. The first primary emphasis of the dendritic pedagogy is to promote and support connections between people: between students and teachers, students and mentors, students with each other, and faculty with each other.

Earth Arts reserves one day per week for the cultivation of human relationships through group meetings and individual conferences. These meetings are scheduled on Wednesdays, in the center of the week as a symbol that human relationships are the central pillar of the school. Earth Arts class times are organized in longer blocks than the traditional 45-minute high school classes, with 2 and 2.5 hour classes as are offered at two of the researched schools, to facilitate a deeper engagement with the subject material and more time for connection between teachers and students. These longer class times also allow for the time required for out-of-classroom experiences such as service learning or professional apprenticeships.

Each of the four researched schools share this foundational emphasis on human relationships, and each school has specific practices that support the school community members with the time and the context that they need to facilitate these connections. One specific practice at each of the researched schools that facilitates human connection is all-school meetings, which are a primary feature of the Earth Arts design, with lunch, workshops, performances, and informal social times providing additional times for relationship cultivation. Additional elements of facilitating human relationships in the Earth Arts design is an open kitchen in the morning available for student and staff use, shared community meals at lunch, and dinner available in the evenings for anyone on site. Earth Arts plans include a working garden that supplies the commercial kitchen with fresh produce, student participation in the preparation of their food, and a family-style serving design where lunch is available on platters at tables, rather than in traditional schoolroom buffet style. This family-style lunch, as well as the potential for additional meals in the morning or evening depending on the student's extracurricular

schedule, facilitates community and fosters the connections between people that happen over shared meals.

There is a primary emphasis on individual faculty advisor mentorships at Earth Arts, with one-on-one conferences between the student and their advisor. There is allotted time in the weekly and monthly Earth Arts schedule of the proposed school for students to meet with their faculty advisors, both individually and as a group, to facilitate personal relationships and personalized guidance on their school path. As per the models at the four researched schools, personal relationships are developed between students and their mentors in their professional apprenticeships, and with community leaders in their service learning placements. These relationships are made possible through the practices and schedule of the school that allow for significant amounts of time to be dedicated to these pursuits.

Every Earth Arts course incorporates a service learning project with a professional in a field related to the course. As per the recommended practices from the service learning programs at LACS and Eagle Rock School as well as Sobel (2009) and Saylan and Blumstein (2011), a dedicated faculty member supports the coordination of service learning placement. This service learning coordinator addresses placement logistics, alongside the classroom teacher who facilitates preparation for and reflection on the experience. The service learning coordinator's involvement with professionals is critical to provide a continuous relationship over time, as professionals will mentor different individual students each school year.

Additionally, the Earth Arts daily schedule supports the facilitation of connections between people by opening the doors two hours before the first class as well as staying

open two hours in the afternoon after school, and two hours in the evening after dinner.

While this time is used for extracurricular activities as in traditional schools, at Earth Arts it is intended as time for informal human relationships: faculty and students have access to light breakfast fare together, yoga mats for yoga classes or personal practice, gardening opportunities, and one-on-one meetings between staff and students either before or after school. If a student is motivated to spend this extracurricular block in a dedicated fashion, a student and mentor teacher or professional can create an independent study project for the student to gain credit during these morning or afternoon timeframes to accelerate or enrich their learning on their pathway to graduation.

Discussion-based meetings as a central organizational structure. All-school meetings are a central tenet of Earth Arts. All-school meetings are essential in all four of the researched schools, with multiple meetings per week in order to clear smaller discussions and announcements off the table to allow one main all-school meeting per week for addressing in-depth questions. The Earth Arts design allocates required credits to the all-school meeting to signify the importance of the meeting, and dedicates an entire two hour block to all-school discussions each week. At Earth Arts, two of these weekly all-school discussion times each month are facilitated as large meetings, while two of these times per month are utilized to address issues within the context of instructional workshops and restorative justice circles, discussed below. This variety of uses for the all-school meeting time increases the value of the meetings' contribution towards graduation preparedness, and emphasizing the meetings as the central philosophical core of the school. Shorter all-school meetings happen during the week at lunchtimes to allow for announcements and smaller discussions between students and staff. Committee

meetings and faculty meetings also happen in two-hour blocks on Wednesdays of alternate weeks.

Committee meetings allow time for in-depth discussions on particular policies or activities of interest to students of choice, while faculty advisory group meetings allow time to address behavioral or academic support within the cohort of students with the faculty mentor. Separating these more personalized discussions into smaller meetings reserves the larger weekly meeting to discuss policies or discipline issues of concern to the whole school, or opportunities for celebration, or all-school instructional workshops. In order to emphasize the importance of these discussions and their educational value, the Earth Arts design assigns credit to the attendance and participation in all-school meetings, committees, and faculty advisory groups.

The academic calendar for Earth Arts is designed with a full week of professional development and staff meetings prior to the beginning of classes, emulating a common practice of teachers beginning the school year early while extending it to a full week, as per the practice at one of the researched schools. This enables the faculty to address any specific concerns together, evaluate any decisions that may need to be revisited, and assist each other in preparation for the year ahead. All four of the researched schools have a weekly staff meeting to facilitate conversation and professional development and collaboration between teachers. Staff meetings are also a time for faculty advisors to address concerns regarding individual students that they mentor, requesting support from the other faculty to assist the students with any particular challenges they are having in their personal or academic lives. Staff meetings are also a time when educational philosophies and practices can be revisited and any need for change addressed. Notably,

at several schools interdisciplinary classes are taught or developed by multiple teachers from different disciplines, and this staff meeting time is meant to support these types of collaborations, as per the recommendation of Sobel (2009).

Dynamic tension between alternative and traditional educational practices.

Earth Arts recognizes the dynamic tension between diverse methods of teaching and learning, while creating a philosophical structure that guides the actions of the school community. While teachers have autonomy to create courses utilizing the methods that they determine to be appropriate to convey information, engage students, and assess learning, a strong emphasis is placed upon the philosophies of the school, particularly personal relationships, participatory discussions, and performance-based assessment.

Additionally, each course has an element of engagement with the world outside of the classroom through service learning, professional apprenticeships and/or wilderness education. The preparation and reflection aspects of each course may either take place in a group classroom setting or in individual one-on-one conferences.

Of particular emphasis in academics is the embedded study of social and environmental impacts of all courses. Toward this aim students at Earth Arts are engaging in practices of media literacy, and critical thinking through multi-media learning activities as per the curricular model at one of the researched schools. Teachers are supported in moving students through a variety of methods and experiences in each course through the utilization of longer class periods. Further, week-long immersion courses are included in the middle of each semester for extended field trips or more in-depth service placements, as seen at three of the four researched schools.

Students are also to be given a high level of autonomy to create independent projects involving research, apprenticeship, and presentation. As per the models at Harmony School and Lehman Alternative Community School (LACS), these independent projects may involve the mentorship of a professional in the community, who may teach with a variety of traditional methods of instruction appropriate to the field. Also following the precedent from these researched schools, each of the independent projects also involve a faculty advisor along with the professional mentor in order to encourage synthesis with the academic goals of the school as well as encourage an exploration in a proposed future career.

Some of the methods of preparation prior to out-of-classroom experiences may be traditional assignments such as reading articles, watching videos, and attending lectures if this is determined to be the best way to present the learning material. Some of the reflection activities may also look traditional, with students writing a research or reflection paper or giving a power-point presentation. However, these practices are meant to be suggestions rather than prescriptions, and each teacher and student may be creative in the design and implementation of their courses. As each course involves assignments, discussions, and experiences out of the classroom, the intention is for each course to teach to and engage a variety of student learning styles, with students often engaged in independent work outside of the classroom and returning for group seminars to reflect on their out-of-classroom experiences.

Finally, Earth Arts is designed to allow students a high degree of agency and choice in their education and their individualized pathway to graduation, with three different types of diplomas offered depending on the student's goals for a career in

sustainability, general college preparation, or advanced studies in environmental sciences.

These independent pathways are guided by the faculty advisor in conference with the student and parents, yet the student's interest and the types of courses and out-of-classroom experiences they pursue largely determine the kind of teaching and learning methods they encounter.

Authentic performance-based assessment. A presentational method of assessment is a core design element in the instructional framework for the Earth Arts courses. Three of the researched schools emphasized a presentational method of assessment in their service learning and apprenticeships. At these schools, students prepare presentations both in individual classes and in the senior year as a culminating presentation prior to graduation. Based on these practices as well as the research of Sobel (2009), Orr (2012), and Saylan and Blumstein (2011), a presentational method of assessment is woven into the central structure of Earth Arts' all-school meeting and the instructional methods of each seminar course. The final all-school meetings of each semester are reserved for seniors' culminating presentations for their graduation by consensus of the entire school community, a practice at one of the four researched schools.

Seminar style round-table discussions are a form of presentational assessment at every class, as teachers notice that students can more thoughtfully participate in discussion when they have done the assignments. Earth Arts emphasizes seminar-style courses based on the researcher's undergraduate university design, which aligns well with the nature of the school design as a way to tie together courses that incorporated the instructional methods of the four researched high schools. While seminar style

discussions and performance-based assessments are emphasized, teachers have autonomy to craft courses in the ways that fit the needs of the topic and student. Diverse methods of instruction, student engagement, and assessment are utilized at the discretion of the teacher, although the emphasis is on performance-based assessment.

Students grow familiar over time with the presentation process, as they give presentations about their independent project work in every class. This culminates in a presentation of their senior project and business plan prior to graduation. Individual teachers may choose to administer formative assessments for particular purposes, yet presentational assessments remain one of the core practices of the school. Students receive specific, spoken and written evaluations of their work from their teachers on a consistent basis, rather than numbered grades. Evaluations include affirmations of strengths as well as challenges, and offer suggestions for action steps that the student can take to improve upon their challenges. Teachers may offer written and verbal feedback regarding extensive observations and individual conference notes on students' individual project work from generation to execution and completion, as well as notes from class preparation, participation, and reflection.

Performance-based consortium waivers. If Earth Arts changes status from independent school to public charter, further research is required to obtain a waiver from standardized testing, as per the example of LACS in Ithaca and their membership in the New York Consortium of Performance-Based Assessment. Waiving the requirement for continually increasing standardized test achievement scores in favor of performance-based assessment affords Earth Arts the opportunity to focus on conceptual knowledge acquisition and retention as well as transference and application of complex thinking and

nature-based skills to environmental and social justice problems in professional environments as measured through performance-based assessment. A standardized testing waiver would allow a charter version of Earth Arts to maximize tuition-free access for all students, an ideal goal, while maintaining the open integrity of the dendritic pedagogy independent of testing requirements in favor of student-interest led learning.

Dendritic Pedagogy Design Proposal

Introduction: Tree symbolism for instructional design. Figure 1 (is an illustration of the pedagogical design in the rooted and branching shape of a tree. This school vision is rooted in the elements on the land, supported by the organizational structures of the school team, and branches out into the community through service learning placements in all of the courses in academics, arts, apprenticeships, and adventures. The tree shape has been chosen for this school design due to the environmental theme of the school, as well as the traditional symbolism of the connection between great philosophers and scholars who have sat teaching under the shade of a large tree, and because of the ecological function of the tree to combat climate change. Trees inhale carbon dioxide and exhale oxygen, they prevent erosion of the topsoil, provide habitat for wildlife, and provide fertilizer in a closed loop system. As planting trees is a primary method to combat climate change, planting schools designed with the dendritic pedagogy may become a primary method to enhance environmental education in our time. As trees are stronger in a multi-generational community of diverse species, the proposed dendritic school design would be strongest in a community of like-minded schools with a diversity of placements, populations, and professional networks.

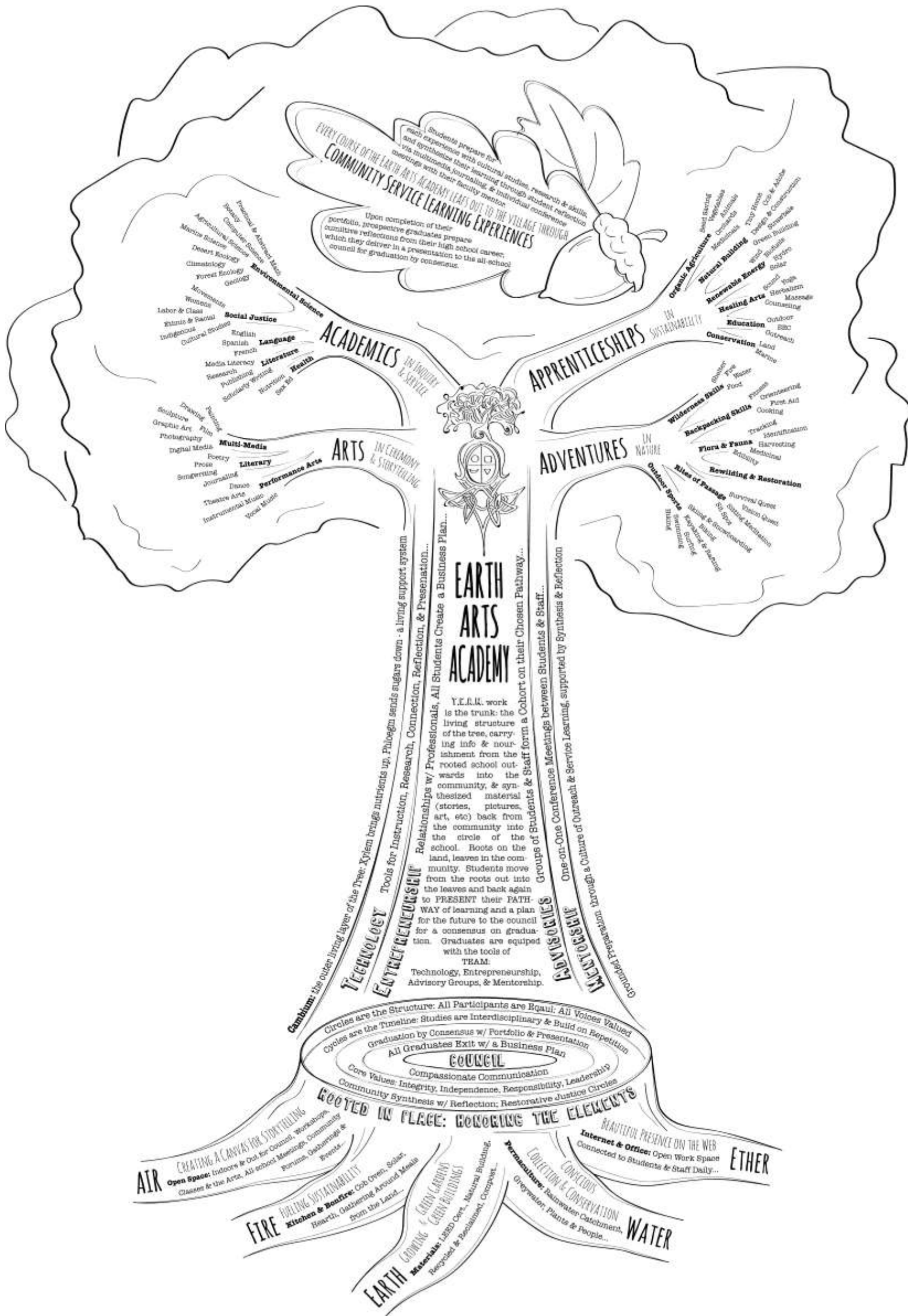


Figure A1. The Dendritic Pedagogical Design.

Student Population and Outcomes. Students who attend Earth Arts Academy are interested in careers in sustainability vocations, social and environmental justice, and environmental sciences. Students who thrive in the dendritic pedagogy tend to be self-motivated, self-disciplined, caring, creative, communicative, and independent learners. They represent a wide cross section of students who learn best in a variety of learning styles, through experiential work or through independent study, for example. Students at Earth Arts will have the opportunity to craft independent projects of their own design related to their coursework, apprenticeships, and service learning placements. Each course will involve independent work and service as well as group service and group preparation, reflection, discussion, or presentation time at a round table where all voices are equal. Students with diverse dispositions will be given scaffolded opportunities to demonstrate competence through individualized forms of instruction that embrace their assets and resources. All students are encouraged to find their passion and engage in the pursuit with a vision or a spirit of exploration. Students who have ambition, entrepreneurship, and creativity enjoy their culminating senior project, which includes an interdisciplinary, under the guidance of an advisor and a professional in the field. The school also emphasizes discussion-based decision-making, so the ideal student places a high priority on authentic communication and is flexible enough to work solo, in professional settings outside of the school setting, or in collaborative group settings.

All students and staff who are on site meet for lunch each day. Some service learning projects may involve students being offsite during course time and some courses may have students traveling a great distance for long or short-term experiences, especially as upperclassmen. All students who are in the local community attend school

each Wednesday for discussions, workshops, or restorative justices circles in Council beginning at lunchtime, and all students and staff stay for Committees or Advisory Groups on alternating mid-afternoons. Students may have an adventurous nature, drawn to the distant and in-depth one-week immersion courses available twice a year for credit, or they may be highly driven in an environmental science field, or they may be reluctant to finish at a traditional high school but they desire to get a high school diploma alongside training in a career of their choice.

Student outcomes include: 1) lasting relationships with their cohort, teachers, and professional mentors, 2) a professional network in fields of interest to them, and 3) an independent senior project in the field of their choice that includes a business plan, a service learning project, and a culminating presentation to the all-school meeting. In the process, students learn basics of communication, facilitation, coaching, and leadership in small and large groups.

Individualized pathways to graduation (IPG). Students traverse an Individualized Pathway to Graduation (IPG) along one of three pathways: Green Trade, Green College, or Green Tech. These three pathways all lead to a high school diploma, yet the Green Trade focuses on vocational training in a field of sustainability, the Green College path focuses on prerequisites for college within the dendritic pedagogical approach, and the Green Tech path focuses on college prep with advanced environmental science. Students have unique experiences based on their choice of coursework and service learning placements for every course. All options have multiple opportunities for electives, though the Green Trade path has the most opportunity for flexibility in coursework without the requirements for college admissions. An accelerated pace of

high school requirements is available to qualify for a diploma faster in all three pathways; however, in order to graduate, all students must be enrolled in the school and earn one complete Leadership credit, earned by attending Wednesday Council meetings for at least two years.

In addition to the choice of diploma pathways, every student's education is individualized due to the student-interest led nature of the course pedagogy. Each course has an independent conference project of the student's design, as well as a service learning project, often independently chosen and executed. Additionally, every senior's learning is individualized because each senior completes an independent senior project, and creates a business plan, which culminates in a Presentation to the Council for qualification to graduate.

Green Trade path: Preparation for a career in sustainability. If students do not desire to attend college, after minimum diploma requirements they may focus their studies on preparation for a profession, including green tech, creative arts, healing arts, agriculture, sustainability, environmental education, or wilderness professions. While all students learn the basics of at least one sustainable vocation, Green Trade students can choose more specialized trainings and certifications in the field of their choice alongside their high school diploma. Advanced professional experiences can be arranged as apprenticeships for credit towards graduation and students may travel to be placed with the mentor or program of their choice.

Green College path: A well-rounded college prep focus. Students who wish to attend college (or keep their options open) are able to meet their requirements through a distribution of courses and pursue some independent interests through electives. Students

on the Green College pathway will take the required coursework to qualify for competitive college admissions, with a required number of years of study of language, mathematics and other disciplines. Green College students have some sustainability career experiences through the service learning component of every course, through immersion courses and through their senior project. Increased opportunities for electives or accelerated academics are available by utilizing the optional open morning or evening school hours and the immersion week courses.

Green Tech path: An intensive environmental science and STEM focus. Honors and AP courses in STEM will be available for Environmental Science students, as well as accelerated coursework if they are self-motivated to pursue independent studies or additional apprenticeship work in the optional morning or evening timeframes, and academic research or environmental field work is available for in-depth immersion week courses twice a year. If any student believes that they can save the planet through science, Earth Arts will get them to work with as much science education and as many excellent teachers in their fields of interest as possible. In addition to the two years of required college-preparatory science, up to six total credits are available in the STEM pathway to graduation. Outside of courses, science oriented or more elective credits are also possible through open school hours and immersion weeks. The intention of the Earth Arts Green Tech path is to funnel all of the community's available financial and professional resources towards the advanced studies of students who are on a trajectory to make environmental change. Earth Arts will support these students to make discoveries, inventions, and protocols for societal change that will decrease human impact on the environment, curtail climate change, and increase the chances of human survival.

Dendritic Design Elements

Explanation of Figure 1: The Dendritic Pedagogical Design

Roots. The roots of the tree represent the foundation of the school in the elements of the physical environment, intentionally cultivating the opportunities for place-based education afforded by the location of a school on a physical site. Earth Arts is designed to be based on land as a model of sustainable buildings with a working farm and garden, an open office computer lab space, a community kitchen, and a large open space for arts and workshops and all-school meetings. This is a departure from the traditional school design with many smaller classrooms, because the students are encouraged to be engaged in the world outside of the classroom during their coursework, and they may be doing independent or group work in the open office. The roots of the tree illustrate the educational functions of each element in nature: air, earth, fire, water, and ether. As shown in the list below, each element represents an aspect of the school grounds as they support student learning.

1. Air - open workshop space for council and creativity.
2. Earth - green gardens and green buildings.
3. Fire - sacred hearth and kitchen cooking fires, renewable energy sources.
4. Water - wise use of water, conservation and restoration.
5. Ether - office space, Internet connection, and a beautiful presence on the web.

Concentric Rings. The concentric rings of the tree are symbolic of the priority that is placed on communication as a main focus and activity in the dendritic design. The circular shape of the design, also present in the round table discussion-based seminar style courses, is representative of the philosophy that all members of the school are equal

and all voices are valid and valued, students and faculty alike. Participation in Council is a requirement for graduation. Attending Council every week for a year is equal to 0.5 Leadership/Council Credit. One Leadership/Council Credit is required for graduation (two years of attendance). Participation in Committee and Advisory Groups are also required for graduation, and students attend all sessions of each meeting for two years to earn their Committee/Advisory Credit.

Although many schools relegate discipline to punishment strategies, Earth Arts views conflict and antisocial behaviors as learning opportunities. Communication and solution-focused problem solving are crucial skills in today's world. When students are called upon and entrusted with the ability to solve their own problems in community, they develop group problem-solving skills and confidence discussing difficult topics. These communication skills are transferrable to a variety of situations, including complex environmental justice issues.

Council. The central philosophical core of the school – and therefore represented by the concentric rings of the core of the tree design – is the Council, otherwise called the all-school meeting. During Council the entire school population of the school gathers together to speak as equals about issues that affect the school community. Beginning over lunch on Wednesday afternoons, every first and third week's Council meeting time will be dedicated to an all-school meeting with a discussion format. This primary Council meeting is used to be used to address community agreements, discussion and proposals, group service days, performances, and ceremonies. Pressing issues may be addressed ahead of standing agenda in the discussion format of this meeting, at the discretion of the facilitators. As the concentric rings of a tree denote the changes over a

tree's life, so does the Council facilitate evolutionary changes over the life of the school as the community adapts to circumstances and situations.

Community Workshops. The second week of the Council time slot each month is dedicated to an all-school workshop in communication or coaching. Issues of immediate consequence to the community can be addressed and potentially resolved within the context of the all-school workshop that may address topics such as nonviolent communication, non-coercive behavioral management, conflict resolution, or diversity training. After instruction on techniques and tools for problem solving within the month's particular workshop topic, real-life examples may be used to address active conflicts for facilitated resolution in partners, small groups, or the all-school meeting.

Restorative justice circles (RJC's). Finally, the fourth Wednesday Council time each month will be dedicated to a restorative justice circle. These circles could either entail training in the facilitated conversation technique, or actively address conflict through the structure of the restorative justice circle, a discussion-based decision making process used at Eagle Rock School. RJC's actively discuss events and impacts of a person's actions when they are out of alignment with the community, and what steps they may take to begin to restore any harm done by their actions. Conflict is handled through discussion with non-coercive discipline strategies with individual, mediated, or community circles to discuss goals and solutions when issues arise between community members. Issues that affect the entire community are handled among peers in RJC's whenever appropriate.

Trunk. Making up the trunk of the tree are the organizational structures supporting the function of the school with the tools of organizational structure. These

frameworks are technology, entrepreneurship, advisory groups, and mentorship (TEAM).

Within the physical structure of a tree, the trunk contains the supportive tissue of the xylem and phloem, which transfer water and nutrients from the roots to the leaves and vice versa. In the metaphoric design of the dendritic pedagogy, the trunk represents the organizational structures that enable Earth Arts to conduct operations in a manner which reaches outward from the school grounds into the community, and vice versa. These are the tools of internal connection as well as vehicles of support to carry students out into the world.

Technology. The wise use of technology is encouraged in the dendritic design, with an awareness of the benefits of technology as a tool and an awareness of the value of time that is technology-free, to facilitate human connections with each other or with the wilderness. Technology is used as a means of communication as well as creative expression and promotion of the messages of importance to a student in their studies or their business. Technology is embraced as a part of our culture. It is a tool to be learned and utilized to support learning, connection, expression, and beauty. Technology is a vital tool in environmental science, in the environmental movement, in social justice, in the arts, and in the organization of our businesses. Computers and Wifi connection are available in the open office, open six non-class hours per day for essential student work time for online courses.

Technology-free times are also encouraged, valued, and modeled by staff.

Technology-free group times are intentionally created to add sanctity to circles, ceremonies, performances, wilderness excursions, and certain Immersion Weeks. Off-

screen conversation, facilitation, and social skills are valued. Nature connection is cultivated as an antidote to a technology-laden world.

Entrepreneurship. Students are encouraged to develop their business skills in the dendritic pedagogy. Business skills are gained through both observation of and practice with the professionals with whom they work in their service learning placements. Further, students seek guidance from a businessperson in order to propose a business plan, a requirement for graduation, to launch an endeavor in the field in which they wish to work. Entrepreneurship is embraced as a value in the Earth Arts culture: every academic course studies the ways professionals relate to the field, establishing relevance between theory and practice. Every student is encouraged to think about their livelihood as an opportunity to create purpose as well as making money. Every student works alongside professionals in service learning placements (SLPs). This way, professionals become mentors for interested students in their field.

Advisory groups. Each faculty advisor has an advisory group of students whom meet every other week and form a family-style support group as the students traverse through the years of schooling together. Groups are started and paired via a course of study with the Advisor in freshman year. The advisory group can be utilized for social connection, peer counseling, restorative justice circles, communication workshops, and any other creative group pursuits. Groups also help the student to decide their Green Pathway through graduation, and fulfill their IPG requirements. Members of each advisory group support each other through the journey of school. As per the faculty advisor relationships at all four researched schools, these relationships can become the

most important in terms of guiding the student's pathway and establishing a network of support and advocacy.

Mentorship. Each faculty advisor cultivates individual relationships with their advisees, creating time for check-ins about school life and pathways as well as personal life. These faculty advisors serve as life coaches as well as professional advisors, college counselors, mediators for conflict, and general support. Faculty Advisors have one-on-one meetings with their Advisees. Additionally, each teacher has individual meetings with students about their independent project for every course. Students learn how to give and receive critical feedback through these conferences. Other mentorship opportunities exist between the students and the professionals guiding their SLPs, and between the student and the SLP coordinator. As per the research of Christman (2012), the relationship between a student and an apprentice often takes on a nurturing quality.

At LACS, the service learning coordinator gets to know each student's interests and habits in the process of placing them in different community service opportunities over time, and he is a mentor to many students at the school. Mentors foster independent communication skills and encourage students to initiate and maintain direct relationships with other faculty and professionals, yet mentors may act as liaisons when needed between students and other faculty, or students and the SLP professionals.

Branches: The 4 A's. Branches are the school's departments, offering courses of study in the 4As: academics, arts, apprenticeships, and adventures. All four branches incorporate SLPs into every course. SLPs involve preparation, action, and reflection. Since many courses will be interdisciplinary in nature, they are not necessarily limited to

one branch. Through these course connections, students work with more than one teacher through their SLPs.

Each Branch of the 4As has a Lead Teacher, as well as teachers in each of the main course areas known as Wings. For instance, the Arts Branch has a Lead Teacher overseeing all of the arts faculty, courses, and arts-related SLPs. Within the Arts Branch, there are three Wings: Multi-Media, Literary, and Performance Arts. Courses are organized within the heading of each Wing, such as in the Multi-Media Wing, which offers courses in painting, drawing, film, graphic art, photography, and digital media. 4 A's Branch Lead Teachers teach a limited course load, are an Advisor for students in Advisory Groups (as are all faculty), and coordinate their Branch scheduling, ordering, and networking alongside a committee of interested students. Lead Teachers determine the courses offered to fill the requirements, the Wing faculty that will be hired to create and lead the courses, the Branch's offerings for Immersion Weeks, and SLPs offered in any given year.

Every course offers SLPs alongside professionals in related fields for every course. Each branch offers semester courses as well as Immersion Weeks, and offers electives for credit during the morning and evening open school hours. While courses are associated with one or more Wings and Branches, they are interdisciplinary, and one course may offer credit across several required branches to advance a student along their IPG. This is modeled after the interdisciplinary courses at Eagle Rock School. Course credit is earned through participation, preparation, and reflective presentations, and credit is often offered for simultaneous credits in multiple branches. Courses may span multiple scheduled class blocks in a day or week. Each Branch offers formal and informal

activities during some of the Open School hours each week, in the morning, afternoon, or evening.

Academics Branch: In Inquiry and Service. The Academics Branch is STEM focused, with EE perspectives included in every course. Interest-led and experiential education are prioritized, with students completing an independent project and/or an SLP alongside every academic course. Interdisciplinary courses are created at the intersection of the five Academic Wings: Environmental Science, Social Justice, Language, Literature, and Health, and interdisciplinary courses are also available that traverse the Arts, Apprenticeships, and Adventures Branches. Academic courses are designed to fit the following criteria:

Relevance. As per the research of Sobel (2009) and Saylan and Blumstein (2011) about increasing student engagement in environmental education, all academic courses will be tied to their relevancy in real world situations via applied learning, with every course including an SLP in a related professional field.

Interdisciplinary. Environmental education traverses traditional subject boundaries, and therefore courses at Earth Arts are created with the intersection of multiple fields of study, following the guidelines of Eagle Rock School and LACS to offer credit in multiple fields.

Incorporate the wise use of technology. As per the practices of Environmental Charter High School (Grayson, 2011), technology is utilized in all coursework for appropriate advancement of study as a tool for investigation, research, communication, and publishing.

Encourage eco-literacy across the curriculum. As per the research of Orr (2012), Saylan and Blumstein (2011) and Gardner (1993), all coursework is regarded as an opportunity for increasing eco-literacy and nature intelligence. Environmental issues and implications are examined throughout the curriculum.

Involve group experiences in immersion weeks. As per the examples at Eagle Rock and LACS, some academic courses can be utilized to prepare for a more in-depth study during the mid-semester Immersion Week courses, such as a language immersion, social justice immersion, or environmental field research.

Academic Branch Wings.

Environmental Science. All of the required courses for college preparatory science and math departments are covered under the environmental science wing. This involves three years of required mathematics courses (four recommended), including elementary and advanced algebra and two- and three-dimensional geometry. Two years of laboratory science is also required in biology, chemistry, and physics (University of CA, 2014). While experiential education is emphasized at Earth Arts, some required college prep material in certain courses may be offered through independent study, in order to create more available time for hands-on learning and diverse EE material. With guidance from an Environmental Science Education specialist, Earth Arts teachers will craft courses that address the required subject areas through knowledge and application in the environmental education field, with courses such as Applied Math, Abstract Math, Computer Science, Agricultural Studies, Ecology, Climatology, Geology, and Botany. All courses will include a comprehensive environmental focus, addressing the environmental impacts of nuclear power in the physics class, for example. SLPs in the

environmental science wing include natural building, agriculture, and restoration work as well as environmental research and field study.

Social Justice. The Social Justice wing offers at least two years of required college-preparatory history and social sciences, with one year of US History and one year of World History credit available. These courses will be taught with an evolving curriculum that is sensitive to the history of marginalized peoples and to the environmental impacts of historical events. Social Justice courses will be taught with a high level of engagement in current events, and with awareness of the interdisciplinary opportunities available with environmental science and world languages as well as the creative arts. Potential courses in social justice include Cultural Studies, Movements for Change, Women's Studies, Ethnic Studies, Indigenous Studies, and Labor Issues. SLPs are available in social and environmental justice groups, alongside community leaders, and in Immersion Week opportunities to partner with hosts for integrated cultural studies.

Literature. Earth Arts literature courses offer up to three years of the four years of college-preparatory English, and students must take one year of Literary Arts to fulfill the fourth required year. Media Literacy, Eco-Literacy, Research, Writing, and Publishing are among the potential course offerings. Addressing environmental and social justice themes throughout literature is a priority for Earth Arts. SLPs are available in journalism and publishing as well as in education.

World Language. Earth Arts offers foreign language courses in the form of group classes and independent study. Two years of a language other than English are required for college. Preparatory Spanish will be the first language offered all four years, with options to add group classes in other languages according to student interest. Students

are also supported to study a language independently, utilizing Open School hours in the morning, afternoon, or evening and the computer lab in the open office. Immersion Week courses are an opportunity for Earth Arts students to travel and engage in a language intensive, or a homestay where no one speaks English. SLPs are available in education settings and Immersion Weeks, as well as in Spanish-speaking organizations.

Health. Earth Arts students are required to take one credit of health, comprised of at least 0.5 credits of nutrition and sex education, and at least 0.5 credits of physical education. Earth Arts' comprehensive sexual education includes how to cultivate healthy emotional relationships as well as sexuality, and the health class also addresses nutritional choices and self-care. SLPs are available with professional nutritionists and sex educators. Physical education requirements are often met through Adventures courses.

Arts Branch: In Ceremony and Storytelling. Earth Arts Academy recognizes the creative arts as central to a well-rounded education. Arts are the tool through which we tell our story, and storytelling is a crucial skill in the modern marketplace. Arts bring people together in ceremony, which is a vital part of the Earth Arts school community.

All students are required to do at least one credit in Art regardless of their Green Path to graduation, and many students will do more. Arts courses involve group workshops and collaborations as well as independent projects, and students may earn art credit through art-oriented independent projects as part of courses from other Branches. Every course that involves art credit includes a public component, to encourage the creative expression and sharing of student voice as an agent for social change. These public arts aspects may include an arts outreach SLP, or a public performance or exhibition. Morning, afternoon,

and evening Open School hours are available for student rehearsals and group projects.

Immersion Week courses may be created for Arts Outreach or Arts Intensive Workshops.

Arts Branch Wings.

Literary Arts. Earth Arts offers courses in poetry, prose, songwriting, and journalism. Students earn credit towards the four years of required college-preparatory English through language-arts based courses. Students practice writing to express their message in both nonfiction and creative writing, and students are encouraged to use technology to publish their work. SLPs are available alongside local writers, or in correspondence with distant writers. Environmental topics are examined in all literature courses, and literary projects may be undertaken as a student's independent project in any course.

Performance Arts. Courses are offered for Earth Arts students who want to pursue performing arts such as dance, theater, vocal music, or instrumental music.

Students are encouraged to create original work to address the issues they are studying, particularly environmental themes, and performing arts projects can be created as a student's individual project in any course. Rehearsal time is available in the open school hours in the morning, afternoon, or evening, and group student projects are encouraged. SLPs are available with local arts organizations and professional artists.

Multimedia Arts. Digital and visual arts are critical mediums to communicate one's message in our modern age. Courses and SLPs are available for Earth Arts students who wish to pursue painting, drawing, sculpture, photography, graphic arts, video, and sound. Multimedia art SLPs may traverse all coursework, including environmental and social justice, environmental science, and world languages. Rather

than group projects, individual SLPs are encouraged for students to become an apprentice to a professional in multimedia arts who can mentor the student in the cultivation and promotion of their own unique creative voice.

Apprenticeships Branch: In Sustainability

All Earth Arts students work alongside professionals for some of their time in high school. These apprenticeships will vary from year to year, as the students initiate them. A network of mentors is available who may offer certain projects per year. An official apprenticeship involves a personal mentor overseeing the work and giving feedback. A mentor is willing to train the apprentice in their trade, offer feedback, write an evaluation, offer recommendations for further study or employment, and also to participate in some community events at the school.

Many SLPs are apprenticeships, although some are group experiences, and apprenticeships are individual. All students need to earn a minimum of one Apprenticeship credit for graduation. Many will earn more. Underclassman courses involve more group experiences. Upperclassmen initiate solo apprenticeships.

Immersion Weeks may be used for group or solo placements alongside professionals

Apprenticeship Branch Wings.

Natural Building. Natural building techniques utilize renewable and sustainably sourced materials to construct buildings with a minimum environmental impact. Students have the opportunity to work alongside a professional in independent work, or in group workshops, to learn sustainable techniques (e.g. Cob, Strawbale, LEED certification).

Natural building SLPs may incorporate geometry and other mathematics, as well as leadership and communication skills, psychology, creative arts, and human ethics.

Organic Agriculture. Working alongside local commercial farmers as individuals or in small groups, interested students have the opportunity to have SLPs with a variety of farmers to learn varying techniques, or to study in depth with one farmer to learn their techniques from seed to seed. These may be general apprenticeships or focused on a particular study such as farming organic food, herbal medicine, humanely raised animals, or techniques such as permaculture or biodynamics. SLPs in agriculture may be incorporated into all science courses, as well as mathematics, world language, and creative arts.

Renewable Energy. Working alongside professionals in the renewable energy industry, SLPs are available in solar power, wind power, hydro power, and biofuels. SLPs in renewable energy have overlap with science and mathematics courses, social and environmental justice issues, community leadership, and creative arts.

Restoration and Conservation. SLPs are available workings alongside professionals in restoration work on forests, meadows, and watersheds. Immersion Week courses, in collaboration with the Adventures Branch and backpacking skills, involve extended fieldwork. SLPs in restoration incorporate environmental science, most notably biology and ecology, and also traverse the fields of environmental and social justice, and creative arts.

Healing Arts. Earth Arts recognizes alternative medicine and healing arts as fields of sustainability, and SLPs are available in disciplines including herbal medicine, yoga, counseling, massage, and sound healing. These apprenticeships are usually individual, and they traverse coursework from a variety of disciplines including the creative arts, and social justice.

Education. Earth Arts students may work alongside environmental educators in fields such as outdoor education, early childhood education, wilderness skills, or creative arts. SLPs in education can be arranged in almost any discipline, including world languages and environmental science. These SLPs may be conducted in a group setting.

Adventures Branch: In Nature.

Experiences in the natural world are seen as imperative to environmental education. Courses are offered to give students experiences in nature. Advanced courses may train students in facilitation of outdoor adventure experiences, with opportunities for certification in such fields as kayak guiding, high ropes course management, or Wilderness First Response. All students get at least one Adventure credit, and many will earn more. For-credit experiences are offered as scheduled Semester Courses, during AM/PM/Eve Open School Hours, and as Immersion Week Courses for Wilderness Trips, Outdoor Sports Trips, Certifications, and Rites of Passage.

Adventures Branch Wings.

Wilderness Skills. Students learn survival skills such as finding and making shelter, water, fire, and food. Courses and projects in the wilderness wing of the adventure branch at Earth Arts include interdisciplinary opportunities with environmental science, environmental and social justice, indigenous studies and relations, facilitation and leadership skills, and creative arts. SLPs include education and outreach with local youth, environmental, or indigenous groups.

Backpacking Skills. Backpacking courses instill practices and skills in the realms of fitness, orienteering, first aid, cooking, and Leave No Trace ethics. Backpacking

courses address physical education and health components of the curriculum as well as advanced communication and council skills. Academic studies of environmental science, environmental and social justice, and medical first responder training blend well with backpacking, as well as arts wing courses such as photography or journalism. SLPs include working with local recreation and forest service organizations on trail maintenance.

Flora & Fauna. Students in flora and fauna courses learn the identification, tracking, and harvesting of wild foods and medicines. Courses and projects in the flora and fauna wing intersect with ecology as well as the creative arts, including creative writing and publishing, healing arts and whole foods, nutrition and health, indigenous relations, and environmental and social justice. SLPs include working with education and indigenous groups as well as wild food groups and herbalists.

Rewilding & Restoration. Courses in rewilding and restoration include interdisciplinary collaboration with environmental science courses, and may overlap with the backpacking wing as course may involve extended trips during Immersion Week for restoration service in backcountry areas. SLPs include working with the forest service, indigenous restoration and land trust groups, and non-profit and private restoration efforts.

Rites of Passage. Initiation courses include survival quests, sit spots, and extended meditation practices. Course offerings are dependent on the current population and the lineages of teachers who are trained in leading culturally appropriate initiations, as well as the current interest and readiness of the student body. Intersections with other wings and opportunities for SLPs include indigenous relations, environmental and social

justice, creative arts, ceremonial music and storytelling, and apprenticeships with community leaders.

Outdoor Sports. Local courses offer hiking, biking, and kayaking, with local trips for rafting, skiing, and snowboarding, and extended trips for surfing and other sports in more distant locations. Outdoor sports provide Earth Arts' most prevalent fulfillment opportunity for the physical education requirement, and these tend to be more individual than team sports. These activities may take place in extracurricular morning and afternoon slots, or may take place during a class time block especially if they include an interdisciplinary component such as environmental science, ecology, or creative arts.

SLPs in outdoor sports include coaching and guide training and practice, as well as remote environmental science projects, medical wilderness first responder training, and artistic opportunities such as GoPro® adventure filmmaking.

Leaves. The leaves of the tree design represent the extension of the pedagogy out into the community through SLPs in every course. Each branch of the 4As leafs out into the community through SLPs, working in projects of real consequence to the people and to the earth. SLPs are often interdisciplinary by nature. Each morning course block has a minimum of 30 hours per semester in an SLP. This credit may fulfill Apprenticeship credit requirements towards graduation. A faculty member is the SLP coordinator, acting as the Lead Teacher of the Apprenticeship Branch. Every course has an SLP - some placements are for a group of students, some placements are solo. For morning classes, each course has a minimum of 30 hours of SLP-focused classes, which may earn Apprenticeship Credit. Some Immersion Weeks are SLPs. SLPs make learning relevant: working alongside professionals in the field of study. All SLPs involve structured

preparation (academic, skills, and cultural), action in the field, and reflection afterwards on the experience.

Earth Arts Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday
7					
8					
9	AM Class Mon, Thurs 9-11:30am	AM Class Tues, Fri 9-11:30am	Staff: Meeting & Prof. Development	AM Class Mon, Thurs 9-11:30am	AM Class Tues, Fri 9-11:30am
10			Students: Opt. Study, Social Time or Late Start		
11	- recess -	- recess -	- gather -	- recess -	- recess -
12	Lunch & Announcements	Lunch & Announcements	Lunch & Meetings	Lunch & Announcements	Lunch & Announcements
1	PM Class Mon, Thurs 1-3pm	PM Class Tues, Fri 1-3pm	All-School Council Wed 1-3pm	PM Class Mon, Thurs 1-3pm	PM Class Tues, Fri 1-3pm
2					
3	Office Hours	Office Hours	Yoga & Games	Office Hours	Office Hours
4	Afterschool Activities 3:30-5:30pm	Afterschool Activities 3:30-5:30pm	Advisory Groups (1st & 3rd Week) -or- Committee Meeting (2nd & 4th Week)	Afterschool Activities 3:30-5:30pm	Afterschool Activities 3:30-5:30pm
5					
6	Dinner	Dinner	Dinner	Dinner	Dinner
7					
8					
9					

Figure A2. The Earth Arts Schedule.

The Earth Arts schedule, shown in Figure 2, is designed to reflect and facilitate the philosophical and educational goals of the school. The daily schedule, weekly schedule, and semester calendar include particular elements to facilitate the goals of the school, such as the Immersion Week in the middle of each semester that allows for more in-depth study. Course requirements for the three graduation pathways (IPGs) offer

credits required for high school graduation, and this section explains how those credits are met within the allotted Earth Arts schedule.

Daily Schedule.

Longer classes. Earth Arts is designed with longer blocks of time in each day, allowing for in-depth conversations, investigations, immersions in course material, and travel time for service learning projects. As per the example at Eagle Rock, courses are offered in morning sessions of 2.5 hours or afternoon sessions of two hours. This is in contrast to standard high school classes, which are offered in 50-minute blocks. Morning courses are recommended for more intensive SLPs to accommodate for any travel time. Courses are generally offered Monday and Thursday or Tuesday and Friday.

Shared meals. Meals are a central gathering time at Earth Arts, with lunch shared onsite daily with everyone present on that day. School announcements are made during lunch to clear the agenda for the larger Council meeting. While students may be offsite for SLPs on other days, all students and faculty are required to attend lunch on Wednesday with the whole school prior to all-school Council. The school is open at breakfast and dinner for optional shared fare, with light breakfast options available, and a cooked dinner made in a rotation by staff and students who are onsite in the evenings.

Weekly Schedule.

Variability. Earth Arts offers teachers some flexibility in course creation. Courses may involve multiple blocks or special arrangements in timing to meet the goals of a particular SLP, for example, or to span more in-depth interdisciplinary studies.

Wednesday meetings. Wednesdays are chosen for all-school meetings as the central pillar of the calendar, symbolizing that discussion-based meetings and facilitating human relationships are central goals of Earth Arts Academy.

Staff meeting. Earth Arts' faculty meet for 2.5 hours every Wednesday morning. This time is used for professional development, collaborative teaching workshop time, resolving issues of concern to the staff, and promoting the goals of the school. Students have an optional late start or study time in the open office hours, group rehearsal or meeting time.

Council. All-School Council meets 1:00 to 3:00 p.m. every Wednesday. This time block is used for traditional Council, the all-school meeting, every first and third Wednesday of the month. The second Wednesday is used for all-school Community Workshops, and the fourth Wednesday is reserved for Restorative Justice Circles (RJs). If the community has a pressing need to alter this rotation for any reason, it is flexible, yet students must attend this block for credit toward graduation.

Advisories and Committees. On Wednesdays from 3:30 to 5:30 p.m., students gather with their Faculty Advisory Groups (on the first and third Wednesdays) or with their Committee (on the second and fourth Wednesdays). Advisory Groups provide a time for group discussions with students and their advisor, as well as opportunities for individual conferences between student and faculty. Committees are based on the LACS model, where every student chooses to engage with a committee in service to an area of interest in the school. Committee options may span a variety of interests, from practicing peer counseling to caring for the school garden to publishing a student newsletter.

Open school hours. Six hours each day are available as Open School hours for students to have access to the open office for computer use, to have study group or group activities such as rehearsals, to exercise or socialize together, and to pursue independent studies and SLPs at their own pace. These are offered in three two-hour blocks of time: morning, afternoon, or evening.

Academic Semester Calendar.

Two 15-week semesters. Courses are offered in block schedules spanning a 15-week calendar each semester. Two semesters comprise a school year, and most courses offer a full credit over the course of a full year or two semesters in a course. One week off is planned per semester, fall break and spring break. Faculty attend school one week earlier than students in the fall for professional development, and stay several days later in the spring. The final week of the courses each semester are reserved for student presentations, and the 16th week at the end of the Spring Semester is reserved for senior project presentations prior to graduation.

Immersion Weeks. In the middle of each semester, courses are offered for Immersion Week that run for six days with 10 hours of study each day, earning 0.5 credit towards graduation. Immersion Weeks offer faculty and professionals the opportunity to facilitate in-depth study such as a language immersion in another country, or remote restoration backpacking trips. Immersion Weeks are based on Eagle Rock's Explore Week and the 'trips' programs at Harmony and LACS.

High School Course Credit Schedule

Credit requirements. High school credits are offered as an approximation of time. One credit equals 120 hours. A standard high school education contains 22 to 24 credits, which are normally arranged in a 50-minute blocks. Earth Arts courses are offered for two or 2.5 hour classes. For the morning session, one 2.5 hour course that meets twice a week offers 75 hours of instruction per semester, or 150 hours over the total year. An afternoon class meets two hours twice a week, for a total of 60 hours in one semester or 120 hours in a year. Based on these hours, a typical Earth Arts course earns 0.5 credits per semester, with morning classes offering an extra 30 hours of credit, which may apply towards SLP requirements.

Over the course of four years at Earth Arts, 24 credits are required for graduation. Over the course of four years at Earth Arts, 16 of these credits are earned in the regular courses that run on Monday, Tuesday, Thursday, and Friday. Four credits are earned in Council/Leadership credit and in Advisory/Committee credit. Four credits are earned in Immersion Weeks, Open School hours, or outside of class. A student wishing to accelerate their learning can create their own opportunities for credit during the open school hours in the morning, afternoon, or evening. Choosing to engage in a consistent, for-credit activity in any one of these two hour timeframes can earn graduation credit for the student: once a week earns 0.25 credits, twice a week earns 0.5 credits, and two hours four days a week earns one full credit.

Three Individualized Pathway to Graduation (IPG) Course Requirements.

The below outline delineates the credit distribution requirements for each of the three IPGs. Non-academic requirements are identical in all three IPGs.

The Green Trade Path entails the following course requirements: 14 required courses are filled over the four years, leaving 10 elective periods available over time to be tailored to the trade the student wishes to pursue. The Green Trade pathway to graduation offers enough distribution that ensures a well-rounded education, yet offers a lower required course load and opens more time for in-depth professional training in one of the fields of sustainability.

3 Environmental Science (2 Science, 1 Math)

2 Social Justice

2 Literature

1 Language

1 Health

1 Arts

1 Adventures

1 Apprenticeships

1 Leadership/Council

1 Advisory/Committee

The Green College path entails the following course requirements: 17 required courses are filled over the four years, leaving 8 elective periods available over time to be tailored to the trade the student wishes to pursue. The Green College path affords students the opportunity to investigate sustainable career options while completing requirements for college admissions.

5 Environmental Science (2 Science, 3 Math)

2 Social Justice

2 Literature

2 Language

1 Health

1 Arts

1 Adventures

1 Apprenticeships

1 Leadership/Council

1 Advisory/Committee

The Green Tech path entails the following course requirements: 20 required courses are filled over the four years, leaving 4 electives available to be tailored to the students' interests. The Green Tech pathway prepares students for college admissions while offering opportunities to explore both career and academic opportunities in environmental science.

7 Environmental Science (3 Science, 4 Math)

2 Social Justice

2 Literature

2 Language

1 Arts

1 Health

1 Adventures

1 Apprenticeships

1 Leadership/Council

1 Advisory/Committee

APPENDIX B

FACULTY SURVEY

High School Instructional Methods, Teacher Survey

PAGE 1 of 3: Personal Information

- 1. What is your name? (Your answers will remain anonymous in the school's report of findings, unless you and your school have agreed otherwise on your consent form).**
- 2. At what email address would you like to be contacted? For researcher use only. Your email will not be shared with anyone.**
- 3. What is your job title? (If you fulfill any other roles for the school as well, please list.)**
- 4. What subjects do you teach?**
- 5. Please share the names of any OTHER innovative high schools that you might recommend for me to contact for the survey-only portion of my study... Including a contact name if available. Thanks very much!**

Page 2 of 3: Curriculum and Instruction

Curriculum Content & Methods Summary

- 6. In your opinion, please RATE the following TEACHING METHODS according to their approximate FREQUENCY OF USE in your personal teaching practice.**

Please mark N/A for any methods not used (each method was offered in a box to check daily/weekly/monthly/quarterly yearly frequency of use, and a box to explain if mainly used for certain subject matter).

Unit Studies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Outdoor Education	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Distance Field Trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Independent Study	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Small Group Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Local Field Trips	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online Student Publishing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Service Learning Projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whole Class Discussion	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Professional Apprenticeships/Internships	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Online Teacher Instruction	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lectures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Please SHARE ANY ADDITIONAL TEACHING METHODS that are used significantly in your teaching:

8. What STUDENT ASSESSMENT methods are used in your teaching practice?

Please RATE according to approximate FREQUENCY OF USE.

Mark N/A for any methods not used (each method was offered in a box to check daily/weekly/monthly/quarterly/yearly frequency of use, and a box to explain if mainly used for certain subject matter).

Pop Quizzes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Demonstration of Skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Written Essay Exams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Portfolio	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Capstone Research Projects	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Peer Review	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
One-on-One Conferences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Oral Exams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short Answer Tests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multiple Choice Tests	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Workshop/Feedback Model	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Multimedia Presentations	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Formative Assessment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

9. Please share any ADDITIONAL STUDENT ASSESSMENT METHODS used in your teaching:

**10. Do you personally teach any of the following as extracurricular activities, in addition to your 'regular' classes?
Please check all that apply.**

- Choir
- Visual Arts
- Video
- Creative Writing
- Internships
- Music
- Environmental Science
- Farming or Gardening
- Theater
- Photography
- Student Support Group

Other 'electives' you teach (please specify):

Page 3 of 3: Strengths & Challenges of Teaching Methods

This is the heart of this survey, any elaboration you have time to offer is welcome. These are all optional questions: Please SKIP ANY THAT DO NOT APPLY.

**11. If you facilitate SERVICE LEARNING PROJECTS, have you experienced any of these common BENEFITS?
Please check all that apply.**

- Environmental stewardship goals are furthered
- Positive publicity for the school

- Motivation for learning increased by practical application
- Responsibility for facilitation diversified among group of adults
- Increased engagement from a variety of students
- Increase in teacher knowledge while learning from professionals alongside students
- Clique boundaries soften as students focus on service
- Positive community relations
- Student career goals enhanced by interaction with professionals
- Students develop mentorships with project leaders
- Service-oriented values create a positive atmosphere
- Alternative environments soften teacher/student relationships

Other significant benefits (please specify):

12. If you facilitate SERVICE LEARNING PROJECTS, have you significantly experienced any of these common CHALLENGES?

Please check all that apply.

- Schedule coordination challenges with outside project leaders
- Different teaching and discipline styles at service site
- Struggle as a teacher to create academically rigorous service learning experiences
- Unclear expectations for student behavior on site
- Bullying opportunities increased in informal situations
- Student progress is difficult to assess

- Projects go over time, cut into time for other teaching activities
- Transportation difficulties
- Lack of student engagement in project

Other significant challenges (please specify):

13. Would you care to elaborate briefly on how you've discovered surprising BENEFITS or creatively overcome any CHALLENGES with SERVICE LEARNING? I'd love to hear any ideas that you'd like us to focus on in our in-person interview. Thanks!

14. If you personally arrange work-oriented APPRENTICESHIPS or INTERNSHIPS for your students (on- or off-site), have you significantly experienced any of these common BENEFITS?

Please check all that apply.

- Decreased disciplinary issues for students in program
- Project leaders offer personal support to students
- Motivation for academic learning increased by practical application
- New students/parents cite program as a reason to enroll
- Student career goals enhanced by interaction with professionals
- Professionals offer teacher valuable feedback about students
- Increased opportunity for alumni career placement
- Positive media coverage for the school

Other significant benefits (please specify)

15. If you personally arrange work-oriented APPRENTICESHIPS or INTERNSHIPS for your students (on- or off-site), have you significantly experienced any of these common CHALLENGES?

Please check all that apply.

- Work ethics/etiquette difficult for students to understand/practice
- Scheduling challenges between professionals and school
- Student/mentor personality clashes affect student success
- Teacher/mentor personality clashes affect ability to work together
- Difficulty to correlate work experience with academics
- Transportation issues strain parent schedules or resources
- Work experiences detract from time for other academics

Other significant challenges (please specify):

16. Would you care to elaborate on (or briefly note) how you've discovered surprising BENEFITS or creatively overcome any CHALLENGES in arranging professional APPRENTICESHIPS / MENTORSHIPS? I'd love to hear any ideas that you'd like us to focus on in our in-person interview. Thanks!

17. If you have facilitated NATURE-BASED, OUTDOOR, or WILDERNESS EXPERIENCES with your students, have you significantly experienced any of these common BENEFITS?

Please check all that apply.

- Students self-confidence developed, has lasting effects through year
- Student comfort zones stretched by rigorous environments
- Normally quiet students express themselves in new environments
- Student stress levels decreased in time away from academics
- Struggling students turn towards staff members, creating lasting trust
- Normally solo students gain respect for their outdoor skills
- Students' self-destructive behaviors decreased due to growth on trip
- Students bond across clique boundaries

Other significant benefits (please specify):

18. If you have facilitated NATURE-BASED, OUTDOOR, or WILDERNESS EXPERIENCES, have you significantly experienced any of these common CHALLENGES?

Please check all that apply.

- Clique boundaries intensify in wilderness, leaving some students alienated
- Students have been violent in wilderness with self, students, or staff
- Student duress triggered by rigorous environmental challenges
- Students experience withdrawal symptoms from addictions
- High wilderness staff turnover is difficult for professional continuity

- High number of emergency incidents in nature/wilderness setting
- Normal student leaders lose confidence, humbled by failures in wilderness
- Struggled to help students who've been pushed beyond their comfort zones
- Students' academic stress causes failure to relax in wilderness

Other significant challenges (please specify):

19. Would you care to elaborate on (or briefly note) how you've discovered surprising BENEFITS or creatively overcome any CHALLENGES in NATURE-BASED, OUTDOOR, or WILDERNESS SETTINGS? I'd love to hear any ideas that you'd like us to focus on in our in-person interview. Thanks!

20. Do you mentor students in some form of longterm individual FACULTY/STUDENT MENTORSHIP program, where each student has a faculty member that meets them regularly, outside of the context of a single class or work project? You may be called the student's counselor, advisor, don, mentor, etc. If so, have you experienced any of the following BENEFITS of this kind of program? Please check all that apply.

- I'm an ally for students in formulating their individual academic plan to meet their goals
- I'm able to offer other insight on students' life to other teachers
- Students confide in me about personal issues
- When students are concerned about other faculty, I've served as a liaison
- I've been a liaison for parents to interface with about their child's life at school

Other significant benefits (please specify)::

21. Do you mentor students in some form of longterm individual FACULTY/STUDENT MENTORSHIP program, where each student has a faculty member that meets them regularly, outside of the context of a single class or work project? You may be called the student's counselor, advisor, don, mentor, etc. If so, have you experienced any of the following BENEFITS of this kind of program? Please check all that apply.

- Students have experienced friction with me as their advisor figure
- I've experienced friction with certain mentored students
- Certain students have circumstances that place high demands on my time
- I do not feel trained to counsel students' personal issues
- I've questioned the financial efficiency of this use of my paid time

Other significant challenges (please specify):

22. Would you care to elaborate on (or briefly note) how you've discovered surprising BENEFITS or creatively overcome any CHALLENGES in FACULTY/STUDENT MENTORSHIPS?

I'd love to hear any ideas that you'd like us to focus on in our in-person interview. Thanks!

23. Would you have thoughts to share in person about any of the following topics, which you feel are innovative in your practice or at your school? Please check all that apply.

- All-Community Meetings
- Smaller Student Group Meetings
- Staff Meetings / Staff Development Protocol
- Working Alongside Students on Projects
- Facilitating Independent Research/Study
- Use of Technology in Teaching/Learning
- Use of Technology in Networking/Organizing

Other (please specify):

24. Has this survey sparked any other ideas you're inspired to share here, or note to ask you in person?

APPENDIX C

Eagle Rock Student Survey

Your Age: _____ **Your Gender:** _____ **Your School Group #:** _____

If you've done service learning (volunteering with your class), are any of these a plus for you?

- I'm often more involved in class when we're volunteering*
- Working with professionals helps me towards a career*
- Volunteering together creates a positive group feeling*
- I've looked up to the project leaders as my mentors*
- I'm often more motivated to learn because it's practical*

Other benefits:

If you've done service learning, are any of these things challenging for you?

- I don't always understand what's expected of me when we're volunteering*
- It's confusing when the project leader's teaching style is different than the regular teachers*
- I spend too much time on the volunteer work, I'd rather do regular schoolwork*
- Students seem to bully each other more when we're volunteering*
- The project isn't always interesting to me, and I get bored*

Other challenges:

When you went on your wilderness orientation trip, were any of these things a plus?

- I felt less stress when we were out in nature*
- I got to be friends with students I wouldn't have normally talked to in school*
- It was hard in a good way, I learned skills and I could do it again*
- It helped me break some bad habits*
- It felt easier for quieter folks to speak up out there*

Other benefits:

When you went on your wilderness orientation trip, were any of these things challenging?

- The staff didn't know how to relate with students who were having a hard time*
- Students formed exclusive little groups on the trip, some people felt left out*
- The trip felt dangerous, some people got hurt*
- Being in nature was way too hard for me- I never want to do that kind of thing again*
- Breaking my habits was way too hard*

Other challenges:

Meeting with your faculty advisor, do you experience any of the following benefits? *I like that there's an adult who I can tell what's really going on with my life* *My advisor helps me plan my school goals* *My other teachers talked to my advisor, now they understand me better* *My advisor talks to my parents for me, I like that they get updates*Other benefits: _____
_____**Meeting with your faculty advisor, do you experience any of the following challenges?** *It seems like my advisor doesn't have enough time for me* *I've got some big problems, and my advisor doesn't know how to help* *I don't really get along with my advisor* *Sometimes my advisor asks too many questions*Other challenges: _____
_____**Please mark #s 1, 2, and 3: What are the top three values you've gained at Eagle Rock:** Compassionate Communication Community Service Environmental Stewardship Character Development Leadership Skills Social Justice Creativity/Arts Career/Life Skills Prep College Prep Individualized Learning Plan**Please share three or more specific skills you've learned (i.e. woodworking, gardening,...):**

1. _____

2. _____

3. _____

Other skills: _____

How do you feel now about coming to Eagle Rock, compared to your previous school?

- It's much more practical
- People understand me more
- I like being connected to nature
- I'm learning much more
- I'm more successful here
- I'm struggling more
- It's too strict
- I miss my friends/family
- I don't agree with the values
- I prefer my old school

What else do you feel about Eagle Rock? Will you stay?

What parts of Eagle Rock *classes* are going really well for you?

What parts of Eagle Rock are going really well *outside of classes*?

Can you think of three things about Eagle Rock *classes* that you wish you could change?

How about three things you wish you could change *outside of classes*?

Anything else you'd like to share?

Would you like to do a short student interview, to talk more about Eagle Rock?

Yes__ No__

APPENDIX D

Eagle Rock Student Survey Results

Eagle Rock School Student Survey

Created & Distributed by Xylem Larla Dey, Feb 3-7, 2014.

Graduate Research for MA in Education, Chico State University.

Demographics of respondents: 24 respondents.

Age: 15x2, 16x4, 17x7, 18x5, 19x5, 20x1

Gender: Mx11, Fx13

ER # (this notes the trimester in which the student entered Eagle Rock, which was in ER # 62 at the spring trimester of the researcher's visit):

54x4, 56x8, 57x1, 58x4, 59x1, 60x2, 61x3, ?x1

If you've done service learning (volunteering with your class), are any of these a plus for you?

66% __ Working with professionals helps me towards a career

54% __ Volunteering together creates a positive group feeling (write-in: !!!)

50% __ I'm often more motivated to learn because it's practical

38% __ I'm often more involved in class when we're volunteering

20% __ I've looked up to the project leaders as my mentors

Other benefits of service learning:

-Service gives me a sense that I'm using my time wisely.

-Service is to give back.

-I just like making a difference.

-Feeling positive about making a difference.

-Gets more experiences on my resume.

-It gets rid of self entitlement and selfishness.

If you've done service learning, are any of these things challenging for you?

50% __ I don't always understand what's expected of me when we're volunteering

50% __ The project isn't always interesting to me, and I get bored

13% __ It's confusing when the project leader's teaching style is different than the regular teachers

5% __ I spend too much time on the volunteer work, I'd rather do regular schoolwork

5% __ Students seem to bully each other more when we're volunteering

Other challenges of service learning:

-Students not seeing the mutual benefits.

-Sometimes the service feels pointless, like there is better things to be doing.

When you went on your wilderness orientation trip, were any of these things a plus?

75% ___ It was hard in a good way, I learned skills and I could do it again

70% ___ I felt less stress when we were out in nature (write-ins: at times more stressful; not always)

67% ___ I got to be friends with students I wouldn't have normally talked to in school

50% ___ It helped me break some bad habits

42% ___ It felt easier for quieter folks to speak up out there

Other benefits of the wilderness trip [categories added by researcher, in brackets]:**-[Nature]:**

-Got a great experience out in the wilderness.

-Nature heals.

-Reconnecting with nature, noticing the moon and stars every night.

-[Health/Fitness]:

-Feeling healthier.

-Muscles & got fit & suntan.

-[Personal Growth]:

-Built more discipline and endurance for me.

-Learning to speak one's truth.

-I had friends and instructors that kept me laughing.

-Things got real. Favorites get broken down.

-[Career skills]:

-It opened my eyes to the possibility of being an outdoor education specialist.

-Leadership skills.

When you went on your wilderness orientation trip, were any of these things challenging?

67% ___ Students formed exclusive little groups on the trip, some people felt left out

16% ___ Breaking my habits was way too hard (write-in: good hard though)

13% ___ The staff didn't know how to relate with students who were having a hard time

5% ___ The trip felt dangerous, some people got hurt

5% ___ Being in nature was way too hard for me- I never want to do that kind of thing again

Other challenges on the wilderness trip [Categories added by researcher, in brackets]:**[Personal growth]:**

-Opening up was my biggest challenge & letting others see me vulnerable.

-It was physically & mentally exhausting.

-I want to go back with the same group, so much has changed.

[Physical]:

-Getting used to a funky smell.

-Blisters.

[Social]:

-Group dynamics were stressful.

-It felt like I was out there by myself, I had an extremely difficult time getting along with my patrol.

[Staff]:

- Staff letting inappropriate behavior continue.
- Micro managing among staff was a problem

[None]:

- None of the above, it was a fun and learning experience.
- None.

Meeting with your faculty advisor, do you experience any of the following benefits?

- 83% ___ My advisor helps me plan my school goals
- 58% ___ I like that there's an adult who I can tell what's really going on with my life
- 25% ___ My other teachers talked to my advisor, now they understand me better
- 21% ___ My advisor talks to my parents for me, I like that they get updates

Other benefits with your advisor:

- Keeps me on track.
- My advisor gives me advice.
- A good male role model for the community.
- It is nice to have an adult I can trust.
- I have a strong bond with my advisors. They both offer different strengths.
- Confident, trustworthy, a channel to vent through.

Meeting with your faculty advisor, do you experience any of the following challenges?

- 29% ___ It seems like my advisor doesn't have enough time for me (write-in: a little busy)
- 16% ___ I've got some big problems, and my advisor doesn't know how to help
- 13% ___ Sometimes my advisor asks too many questions
- 0% ___ I don't really get along with my advisor

Other challenges with your advisor:

- I don't know how to build a better relationship with my advisor.
- Sometimes she doesn't really talk to me.
- She gets on my nerves sometimes.
- No challenges / No problems
- Not always a sense of urgency to help me right away.
- Not as effective as it should be.
- No college prep.
- Some things I've told my advisor weren't kept confidential, and that made me feel uneasy and a little less trusting towards them.

Please mark #s 1, 2, and 3

[Note, the format of this question was confusing, some entered 1-10 or valued all at levels 1-3. Items are ordered by number of 1st level listings]:

What are the top three values you've gained at Eagle Rock:

- 1x7, 2x4, 3x1, 5___ Character Development (write-in: !!)
- 1x6, 2x4, 3x2___ Compassionate Communication (write-in: !!)
- 1x5, 2x2, 6___ Social Justice

1x4, 2x4, 3x6 ___ Leadership Skills (write-in: !)
 1x4, 2, 3x2, 10 ___ Individualized Learning Plan
 1x2, 3x4, 4x1 ___ Community Service
 1x2, 2x4, 3x5, 8 ___ Career/Life Skills Prep
 1x2, 2x3, 3x5, 7 ___ Creativity/Arts
 2x4, 4x2 ___ Environmental Stewardship
 3x3, 9 ___ College Prep
 All of the above (2)

Please share three or more specific skills you've learned (i.e. woodworking, gardening,...) [Note, categories are added by researcher, in brackets]:

[Personal Growth]: personal growth x2, Learning to be more assertive, stronger work ethic, critical thinking, self control, speaking my mind, coping, consistent/persistent attention towards my attitude & mentality, committing, integrity, empathy, developing more as a person, how to enjoy myself with nothing to do, patience x2

[Kitchen]: kitchen x10, skills in the kitchen / I've learned to work inside a kitchen/ i learned how to use a knife properly / kitchen patrol leading, Kitchen Patrol/skills / Barista

[Communication]: I've learned how to communicate with different groups of people, compassionate communication, respectful confrontation tactics, communicating effectively, conflict resolution skills, living with others x3, leadership skills x3, connections with staff, student & teacher communication

[Environmental]: gardening x3, outdoor leadership, wilderness basics, compost x3: proper compost / I learned the process of compost / composting,

[Arts, performance]: Singing, going to berklee to learn more music, I've learned some good acting techniques, digital music, poetry, improving musical abilities

[Arts, visual]: Ceramics x2, oil painting, developing photography x2, creativity/art

[Crafts]: Wood working x2, gear repair, sewing

[Health]: personal fitness, cross-fit, weight lifting, tele-mark skiing

[Other]: race was a topic of discussion and it was part of my education, I've learned to help classmates learn, volunteering, research skills, sign language, scientific models, positive study habits,

How do you feel now about coming to Eagle Rock, compared to your previous school?

75% ___ I like being connected to nature

75% ___ I'm more successful here

70% ___ I miss my friends/family

70% ___ It's much more practical

70% ___ I'm learning much more

58% ___ People understand me more

16% ___ I'm struggling more

8% ___ It's too strict (write-in: a little strict)

8% ___ I don't agree with the values (write-in: not all of them)

5% ___ I prefer my old school (write-in: in some ways)

What parts of Eagle Rock classes are going really well for you?

[Note, categories are added by researcher, in brackets]:

[Instruction]: -The learning environment is much calmer and there is one on one help. - Often: the pace, the attention, teacher engagement. -Reflection on work. -One-on-one with the teacher really helps my learning styles. -The teachers can be patient and explain something a 2nd time. -Teachers figure out what we need to learn better. -Teachers have time to get to help you because smaller class sizes. -They understand most things that are going on for us academically and personally.

[Content]: -The ones when I have to think for myself. -I'm learning things I actually care about. -What else they teach us. -Understanding the content while being supported by my teachers & peers on an academic & personal level.

[General]: - The participation, student interest, personal investment in curriculum. -Both of my classes are very interesting. - I like the small classes, it makes me feel more comfortable in the classroom. - Just having 2 classes a day. - They're not like public high school classes, they're personalized and flexible to fit the needs of individuals. - I like helping instructors make their classes stronger. - It's not hard for me to stay involved and pay attention. - I am abiding by the three P's. I am getting ALL of my credit. I am taking my time graduating and having fun here. I am at a point where I can choose classes for fun, not credit.

[Specific Classes]: - Science of Strength. It's my passion to work out & I'm working out better skills & learning. - Research learning English. -Research. - My photography I got credit in. -Fire! - My independent study is helping me intentionally relate math to music on a deep level. - Research because I like to stay busy and do my work.

Can you think of three things about Eagle Rock classes that you wish you could change?

[Note, categories are added by researcher, in brackets]:

[Levels]: - More/leveled language classes. - I wish classes were leveled by ability. - Adding varying difficulties. - Advanced classes. - I wish classes were more rigorous.

[Math]: -More math classes. - More math forced on us on a daily basis. - Regular math classes (e.g. trig, algebra). - Leveled math classes. - I think all students should enroll in Khan Academy while here.

[Career]: - Career research. - Meetings with experts in the field.

[General]: - Longer? -The ding system should not be for classes. - The different learning styles that people have. - More study hours and help with homework. - More teachers/ diverse classes. -Classes should stress the creation of a class team/community. - Unique Projects. - To be able to go as far as I want in a subject. Sometimes the class ends and I want to keep going. - More trips. - More environmental focus. - Nothing x5.

Would you like to do a short student interview, to talk more about Eagle Rock?

Yes x 38%, No x 54%

APPENDIX E

DESCRIPTION OF THE FOUR SCHOOLS

Eagle Rock School

Eagle Rock School and Professional Development Center (Eagle Rock) is a tuition-free private residential school on a 640-acre campus based in the mountain town of Estes Park, Colorado. Eagle Rock students are intentionally diverse with regards to race as well as intentionally admitting a mixture of rural, suburban, and urban students. Students are selected via application on the criteria that the students are otherwise not expected to graduate from traditional high schools, and that the student's family would need financial assistance to send their child to a private school. Eagle Rock's mission is to be a laboratory and tool for the reform of public American high school education. Eagle Rock students' tuition, staff salary, facility maintenance, and program implementation are all funded by the Honda Motor Corporation, for which Eagle Rock is its primary American philanthropic endeavor.

Faculty have a weekly Staff Meeting in which they discuss issues of faculty concern as well as pursue in-house Professional Development endeavors and meet in Critical Friends Groups (CFGs) to work on goals related to the PD themes that the staff are focused on for the year, themes which are chosen each year by the Head of School. CFGs and the associated facilitated dialogues known as Protocols are practices developed by the Coalition of Essential Schools (CES), a national high school reform effort founded by the late author, Ted Sizer, of which Eagle Rock is a presenting member at the national conference. Faculty from Eagle Rock travel to present to various high school

consortiums nationwide and to assist schools, often working with high school principals in a process of change in their school's operation. Furthering Eagle Rock's mission of furthering goals of reform in American public education, the head of the Professional Development Department, Michael Soguero, has crafted longstanding relationships and schedules regular visits with Eagle Rock faculty members to work with Big Picture Schools, performance-based consortiums and other high schools, including schools associated with former Eagle Rock community members.

Eagle Rock's academic planning leans heavily on the curricular presentation strategies from the Workshop Model and from Understanding by Design. Students at Eagle Rock proceed through an Individualized Learning Plan (ILP), which guides the students through a pathway to fulfill graduation requirements with courses and experiences distributed through power standards, based on the 5 Expectations that are part of Eagle Rock's guiding $8 + 5 = 10$ values system: 8 themes, 5 expectations, and 10 Commitments. Students receive evaluations rather than grades in a credit/no credit system, with students earning credit for each class by collecting and producing materials for a portfolio. Students present a portfolio of their completed work to a panel of faculty at the close of every trimester. A primary feature of the school is its 25-day Wilderness Orientation Course, which every student attends in their first semester at the school. Other outdoor experiences are offered as part of optional 'Explore Week' trips mid-trimester, and many classes have an embedded outdoor component such as a Geology class that does rock climbing, or the Science class that surveys bird populations in the nearby Rocky Mountain National Park (RMNP). The Wilderness Experience is designed to orient the students to the expectations and culture of the school, including the practice

of resolving conflict with the mechanism of having a Circle, in which all students and faculty openly discuss and receive input on issues of concern. Circles may also happen during House Meetings, classes, or activities. Each student boarding house is comprised of up to 12 students, one or two House Parents, 3 Fellows, and 3-6 associated faculty members. Eagle Rock has moved away from expulsion as a means to handle 'non-negotiable' behaviors, experimenting instead with processes called Restorative Justice Council (RJC) and Restorative Practices. An RJC is comprised of students and faculty dedicated to addressing student behavioral issues with the intent to determine their causes. The RJC also designs action steps, in conversation with the student, which the student can take to restore any harm that a students' behavior has caused within the community.

The Behavioral Sciences Instructional Specialist, Jon Anderson, has created a now long-standing service and internship opportunity for the students through RMNP. These opportunities are through both the FIRE program that trains students with the Hot Shots team, and science-related ecology courses in the various seasons. Students have an option to create an internship program at RMNP, and have a high retention rate from this program into employment with the National Park Service. A new Summer Internship course has been created based on the success of the RMNP program, facilitating student internships at other local businesses or organizations, such as an organic farm, and a horse ranch. Eagle Rock employs a full-time Service Learning Instructional Specialist, John Guffey, who teaches classes that facilitate student engage in local or distant community service opportunities and incorporate academic study of the philosophy and ethic of service learning, as well as studying the cultural contexts of service with

materials sourced from the communities in which the students will be of service. Guffey has re-established a service learning relationship in 2014 with the Lakota tribe of Pine Ridge Reservation in South Dakota, where the students spend their Explore Week working alongside residents on a project of local relevance. Guffey is also available to help faculty who wish for assistance in integrating service learning experiences into their courses in other disciplines. Eagle Rock holds a daily Gathering, lasting either a half or a whole hour long, a student-facilitated meeting of all students and faculty to gather and address announcements as well as staff and student voices of concern or relevance to the entire community. While student voice, faculty input, and proposals are actively gathered and welcome at Eagle Rock, the decision-making at Eagle Rock school is not considered democratic because a leadership team makes decisions with the Head of School having final authority, with the consultation and approval of the Board of Directors from Honda.

Windsor House School

Windsor House School is a Canadian public K-12 school in North Vancouver, British Columbia. Helen Hughes founded Windsor House in 1971 for her daughter, current Principal Meghan Carrico. Helen Hughes was the original director of Windsor House for 30 years, until the North Vancouver school district installed a new principal in response to the Provincial School Boards new standards for high schools. The interim principal created a high school curriculum that offered a pathway to graduation through Windsor House, which had previously concluded at grade 11. Many students transferred to traditional high schools to complete high school graduation, as some still do. This had become a concern for the North Vancouver School District 10 years ago, following a

change in provincial law akin to America's No Child Left Behind law. Though the jurisdiction of Windsor House has since transferred to Salt Spring Islands School District, there is now a full set of high school courses in accordance with the standard BC curriculum, although these courses largely do not continue with the free school ethos of the lower grades. As one teacher said, they are essentially teaching 'out of workbooks' for the required high school classes.

Carrico taught at the school for years before becoming Principal in 2012.

Windsor House operates at its full capacity of 160 students, with 20 students graduating in 2014. There is a 33:1 student/teacher ratio at the high school level. The student body is 85% Caucasian, and the staff is 100% Caucasian.

Windsor House provides a democratic education, based on the model of Summerhill School by A.S. Neill and Sudbury Valley. There is an All-School Meeting once a week comprised of announcements and proposals, followed by School Council, during which proposals are discussed between any interested parties with a consensus-based model. A student chairperson, adhering loosely to Robert's Rules of Order, runs School Council discussions. Conversation is addressed to the chair and concerned parties are invited to propose friendly amendments to the proposal to alleviate their concern. Students can vote on anything related to school practices and policies, except issues that affect health and safety. The discipline philosophy of the school is non-coercive, and although there are many classes for the younger grades, the younger students are free to learn through play all day. Between the ages of 10-14, the philosophy of the school is to watch for when students demonstrate interest in more formal learning, and at that point they are encouraged to attend classes and fill in the gaps that they did not attend prior.

Since 2004 the high school has offered the standard B.C. high school curriculum, offering a track to graduation through the course material and standardized testing at 10th, 11th, and 12th grade levels. However, there is a second track to graduation without a diploma, called Adult Grad, which over 25% of the students choose, as they are preparing for other careers in lieu of college preparation.

Windsor House has a daily Teen Meeting, as well as a daily Judicial Council (JC) meeting, the organization of students who volunteer to help resolve interpersonal conflicts and individual behavioral issues. Windsor House high school faculty meet in a staff meeting once a week on Wednesdays, when most of the students are not attending school, as well as having weekly professional development session after school on such topics as coaching or nonviolent communication. Every student has a faculty advisor, who guides their pathway through the school curriculum, and is available for academic and emotional guidance and support.

Windsor House is a multiage school, welcoming younger students into any space or class. Any student may offer to teach a class, or request that one is taught. Windsor House has simulation games that involve multi-aged groupings and are humanities focused. The school also hosts experiential projects, inquiry projects, theater productions, small businesses, and a radio station, in an environment where children are learning through play, peer mentorship, teaching and learning where older students work with younger students. There are weekly or biweekly outdoor trips, as well as a monthly wilderness trip, and an annual week-long high school trip that may involve a nature immersion. Windsor House is a parent participation school, with each parent

volunteering an average of 2-4 hours per week. Visiting parents teaching on-site classes in their disciplines are the main source of professional apprenticeship-type experiences.

Lehman Alternative Community School

Lehman Alternative Community School (LACS) is a public “school of choice” in the Ithaca City School District, which admits students based on a lottery from an application pool. The school is comprised of 300 students in grades 7-12, with a goal to reflect the same demographic diversity as the city of Ithaca through applicant “selection pools.” LACS was founded by Dave Lehman, who was the principal for many years. There has only been one interim principal between Lehman and current Principal Diane Carruthers, who has started her term as principal in 2013, after 22 years as a teacher and one year as interim principal at a middle school. LACS is a member of the New York Performance- Based Consortium, a set of public schools that has been granted a waiver to conduct graduation via alternate means than the NY Regents Exams, and seniors complete requirements through a Graduation By Exhibition, a presentation of their learning to the school community. The school is run with a strong emphasis on democratic education: there are three all-school meetings per week, facilitated by two students and run with a microphone. Two meetings are focused on announcements, and one meeting is focused on democratic decision-making. This decision-making meeting addresses various proposals that are presented to the group, open for discussion to gather input, propose amendments, or move forward to a vote. Successful proposals proceed to a vote by all students with a counted show of hands, and select approved issues are moved to the Site-Based Council (comprised of staff, parents, students, and community

members) or to the bi-weekly Staff Meeting for further discussion and consensus decision-making.

Orientation to the values of the school as well as resolving interpersonal conflict or deviance from school expectations are addressed by the Welcoming and Mentorship (WAM), a student committee under the guidance of a teacher. All students serve on a 'Committee' twice a week, serving an area of need within the school community or grounds. Additionally, all students are required to complete at least 60 hours of community service as a graduation requirement, although many students do serve up to 100 hours or more. There is a dedicated Community Service teacher who facilitates academic classes on the philosophy of service learning as well as reflection on the community service experiences. His classes also address social justice impacts and awareness of conditioned mindset of privilege that raises issues associated with being of service to a community that is different than one's own, and the cultural material related to the communities in which the students will be of service.

The community service teacher, Jon Raimon, facilitates each student's placement into a local service opportunity of their choice to attend twice a week, and the school provides transportation to and from their placements at the opening and closing of the school day. Mr. Raimon also leads an immersion at the Akwesasne Mohawk reservation, a Native American tribe that spans across the border between Upstate New York and Quebec. Mr. Raimon has a longstanding relationship with bringing students to volunteer at Akwesasne, spanning the near twenty years of his work at LACS. Social Justice teachings and a global perspective are woven through nearly every class at LACS, from Latin American Studies to Ecology to Economics. A relationship with the earth is

encouraged through annual trips to various natural locations, ample service opportunities in outdoor environments (such as the farm internship facilitated by the Ecology and Science teacher), and environmentalism themes are infused in many of the classes. There is a strong co-curricular relationship between the Media Literacy teacher and the Ecology teacher, and they have each created curricula to promote critical thinking about their field that is emulated by other high schools nationwide. There is a strong relationship with nearby Ithaca College, with college students visiting LACS classes, and some LACS faculty and teaching classes at both schools. LACS students all belong to a 'Family Group,' an advisory group comprised of approximately 12 students and headed by two faculty members. All students also belong to a themed Committee, an in-school service organization that meets twice a week to address concerns and implement ideas related to the topic or project of choice.

The Harmony School

Harmony School is an independent, sliding-scale tuition school founded 40 years ago, located in Bloomington, Indiana. Harmony was founded in 1974 by Steve 'Roc' Boncheck, who is still the Director today. It is a member of the Coalition of Essential Schools, and affiliated with the National School Reform Faculty. The K-12 school is comprised of 200 students, of whom 60 students are enrolled in Harmony High School (grades 9-12). Of these 60 high school students, 80% receive financial assistance, 60% qualify for free lunch, 15% have special needs, and 10% are ELL (English Language learners). 54 high school students are Caucasian, 4 are Asian, 1 is Latino, and 1 is African American. There are five high school teachers, all of whom are Caucasian, two women and three men. The five teachers teach in subjects Humanities, Social Studies, Language

Arts, Math, and Science, and every teacher is an advisor to one of the grades (the Science teacher is the 10th grade advisor, for instance), and the Social Studies teacher is the High School Coordinator.

Advisories meet in a group every other week, discussing relevant academic or personal topics for the grade such as standardized test preparation, college applications, planning classes, choosing colleges, and sexual education. While Harmony doesn't have a formalized service learning program, the students have a "soft requirement" to do 30 hours of community service during their high school career – an act which is encouraged, yet not formally facilitated outside of two school-wide community service days per year. One unique feature of the school is the senior year project, a year-long apprenticeship with a professional in the field of the student's choosing concluding in a presentation regarding the content and experience of their work, with the purpose of investigating a career that they might be interested in pursuing after high school. The High School has a 'Family Meeting' for an hour and 45 minutes every Friday, attended by all faculty and students, in which announcements and plans are made that involve everyone, committee members are nominated and voted in, and any relevant issues are discussed in a democratic meeting style. Student issues, such as disruptive behavior or conflicts between students, are resolved with a Student Advisory, comprised of volunteer students with two teachers.

Harmony School does not have tracked levels in subjects, nor does it have honors or AP classes, nor special education classes or assistants. Students are able to take two classes during their high school career at either Indiana University or Ivy Tech, which students are encouraged to utilize for advanced English or lab science courses. The

science curriculum is based on experiential learning, and there is no science laboratory, so many students take lab science at Ivy Tech. A relationship with the earth is encouraged through the Botany class's gardening, permaculture, and local land restoration projects as well as through the school's facilitated Earth Day service and nature experiences, the week-long high school trips, and the Green Committee that oversees sustainable practices on the school grounds.