Cultivating Ecological Teachers and Learners Using Project Learning Tree

Jaclyn C. Stallard

Lesley University

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Abstract

The goal of this action research project, entitled Cultivating Ecological Teachers and Learners (ETL) Using Project Learning Tree (PLT), was to identify potential ways in which a single environmental education program (PLT) could help support, develop, and cultivate the philosophy of and pedagogies embraced by an ecology-based teaching approach (ETL) via the design and delivery of its most popular resource, the *PreK-8 Environmental Education Activity Guide.* Conclusions are organized into two sets of recommendations: educational materials and professional development. Two primary actions served as the foundation of this project and they were executed over four action research cycles. The first action was the creation and engagement of an advisory group, which was composed of eight PLT content experts. The second action consisted of the creation and distribution of a questionnaire to engage the ETL audience. The survey was completed by Lesley University ETL program alumni and analyzed by the PLT advisory group. The survey findings were reviewed by all PLT advisory group members, and final recommendations were made on actions PLT must take to develop more ecological teachers and learners through its educational materials and professional development delivery system. Primary conclusions include the creation of PLT educational materials and professional development offerings that focus on the five appropriate ETL pedagogies, the assembly of PLT unit-based curriculum related to ETL and appropriate national academic standards, as well as the establishment of learning communities in PLT's professional development offerings. These results are significant, as they will inform the implementation of PLT's 2011-2015 strategic plan.

Cultivating Ecological Teachers and Learners Using Project Learning Tree

Introduction

Education is my passion. I find education work alluring because of its profound ability to affect student lives. My long-term personal and professional goal is to achieve a sustainable future through education, action, and compassion. Embedded within this goal is the task of creating audience-specific teaching tools that support the varied learning styles of many people, including youth, adults, communities, and families.

To support my long-term goal, I must maintain a career that both stimulates my appreciation of the natural sciences and challenges my knowledge, skills, and abilities. For over seven years, I have enjoyed employment at Project Learning Tree (PLT), a non-profit organization and environmental education program designed for teachers and other educators who work with youth ranging from preschool through grade 12. As PLT's Manager of Education Programs, I complete revisions for our PreK-12 environmental education curricula. In addition, I conduct PLT workshops and facilitator trainings, write articles for PLT's various communication venues, create PLT activity pages for state forestry magazines, as well as manage a service-learning grant program and outstanding educator awards program. I am also responsible for planning all content for PLT's annual International Coordinators' Conference, which provides professional development opportunities for PLT's state leadership. Finally, I present PLT educational programs at various education conferences and other workshops and events across the country.

Having been immersed in the environmental education field for nearly a decade, I find it difficult to separate the personal from the professional. Individuals often define themselves by their environment, which includes the overlapping spheres of nature, society, and economy. For

me, the appeal of Ecological Teaching and Learning (ETL) lies in its pedagogies, which offer pathways to bridge intellect and emotion. In pondering my curiosities about and concerns for PLT and ETL, my aspiration to disseminate the values and pedagogies of ETL through the PLT program was realized. This action research project seeks to take a step in that direction.

Research Purpose and Rationale

The purpose of this action research project is to identify pathways to develop ecological teachers and learners through Project Learning Tree's program offerings. To do so, this action research project will first define the overlapping pedagogies between PLT and ETL and then explore viable models for integrating ETL pedagogies into PLT's education materials and professional development offerings.

This action research project presents an internally important undertaking to my role as Manager of Education Programs at PLT's national headquarters in Washington, DC, as well as my role as an active ecological teacher and learner. One of my professional responsibilities includes revising PLT's educational materials based on independent evaluation, teacher feedback, and current trends in the field of education. In 2013, PLT embarked on a three-year revision process that will significantly affect its signature resource, the *PreK-8 Environmental Education Activity Guide*. In order to remain relevant for classroom teachers and informal educators, PLT materials must reflect the latest teaching strategies, meet academic standards, and be reliable, user-friendly, trusted sources of information. This three-year revision process presents an ideal opportunity for PLT to incorporate stronger and more explicit references to ETL pedagogies.

Externally, the importance of this action research project is twofold. First, it supports current ecological teachers and learners in finding a medium with which to bridge their morals

and their practices. As an outcome of this project, PLT can become a tool to help educators successfully integrate ETL into their teaching practice. Second, this action research project is important to PLT educators previously unfamiliar with the philosophy and pedagogies of ETL. I envision PLT becoming a tool to introduce key ETL pedagogies to classroom teachers through its curricular materials and professional development.

Through this research, I explore how to work within the confines of the current educational system to provide PLT teachers with tools to practice ETL in classrooms across the country. I aim to identify ways that PLT can incorporate ETL to shift the focus away from content and assessment and instead offer opportunities to embrace pedagogical methods, environments, and materials proven to positively affect student attitudes and achievement.

Research Questions

My action research project seeks to inform the ideal design and delivery for PLT's new pre-kindergarten through grade eight curriculum with an emphasis on ETL. As a founding framework, one main research question was created. It is articulated below, along with four sub-questions which offer guidance and additional support. As my project unfolded over time, I explored the relevancy of these four original sub-questions. A discussion of their relevancy and appropriateness can be found in the Methodology section.

Main research question:

- In what ways can I develop ecological teachers and learners though Project Learning Tree's new pre-k – 8 curriculum's design and delivery?

Four supporting sub-questions:

- Where do the pedagogies of PLT and ETL intersect?

- How can an advisory group contribute to the effort to bring together the goals of PLT and ETL?
- What kind of professional development would help educators meet student learning goals while also training teachers to support ETL pedagogies?
- How can a focus on ETL improve PLT's ability to support teachers in meeting academic standards and STEM (science, technology, engineering, and mathematics) objectives?

Context and Activity Setting

Started in 1976, Project Learning Tree remains a cornerstone for environmental education and is one of the most widely used environmental education programs in the United States and abroad. PLT continues to set the standard for excellence in environmental education, and a number of other successful national providers in the field, such as Project WILD and Project WET, have patterned their educational resources, training models, and program delivery systems on the models that PLT pioneered (Project Learning Tree, 2013).

Project Learning Tree prides itself on its mission: "to advance environmental literacy and promote stewardship through excellence in environmental education, professional development, and curriculum resources that use trees and forests as windows on the world" (Project Learning Tree, 2011, p. 3). While PLT's mission has largely stayed the same the past four decades, the world of education is constantly changing in demographics and pedagogy. Materials that do not reflect current teaching strategies, academic standards, evaluation tools, and changing demographics fail to be used by educators. Recent market research indicates that PLT's "three-legged stool" of curricula, professional development, and network localization, is sound but that elements of it must change to achieve continued success (personal communication, L. Dropkin,

February 6, 2013). My inquiry will investigate how we can use both avenues of PLT's curriculum and professional development to support teachers' understanding, adoption, and transfer of ETL philosophy to the students they reach.

For nearly forty years, PLT has taught millions of American students "*how to think, not what to think* about complex environmental issues" (emphasis original, Project Learning Tree, 2013, p. 2). To reach students, PLT provides teachers with the training, knowledge, skills, and resources required to develop or modify their individualized curriculum with effective and engaging place-based learning opportunities using their school grounds, nearby public lands, and forested landscapes as extensions to their classrooms. Environmental stewardship is increased through an appreciation and study of trees and forest ecology, as well as the role of trees and forests in the community's culture and economics. Studying trees and other forest ecology topics through PLT's multidisciplinary approach fosters students' sense of place and helps create future environmental stewards. PLT's inquiry-based, multi-disciplinary approach has been proven to improve students' attitude and aptitude (Easton, 2011).

Project Learning Tree embraces teacher professional development as part of its practice of delivering environmental education curriculum materials. PLT was one of the first environmental education programs in the United States to establish a professional development protocol as part of its methodology (personal communication, K. McGlauflin, March 5, 2013). Each year 30,000 educators attend PLT professional development workshops where they receive training and tools to help integrate PLT's environmental education materials into their classroom teaching (Project Learning Tree, 2013, p. iv).

Identifying innovative ways to introduce teachers to ETL and support their practice using PLT curriculum materials will benefit all parties involved. Project Learning Tree resources are

available to all educators, and many graduates of Lesley University's ETL masters program are likely familiar with some of the many resources PLT has to offer. While PLT only reaches a small percentage of all of the educators in the United States each year, it still presents a huge opportunity to promote ETL ideals.

The entirety of this action research project took place at the Project Learning Tree national headquarters in Washington, DC. At this location, I am one of seven full-time employees who work to administer the nationwide, non-profit organization. From the top to the bottom, PLT's programs are executed by one president, three directors, two managers, and one coordinator. My work on this action research project was aided by one other individual at PLT's national headquarters, my direct supervisor Al Stenstrup, the Director of PLT's Education Programs. My supervisor and I hosted informal "check-ins" every other week in order to review data generated by my action research. This data triangulation technique helped me to verify findings and provide adequate "checks on what the data mean" (Dana, 2013, p. 58).

The design of this action research project mandates expertise in two content areas: Project Learning Tree and Ecological Teaching and Learning. To channel PLT expertise and support this project's second sub-question, I created an advisory group of eight nationwide PLT program partners (see Appendix A), and I consider this group of professionals to be co-researchers in this project.

In addition to collecting input from PLT partners, I also sought expertise from the ETL alumni community. To gain this insight, I created and distributed a questionnaire to current and past students of Lesley University's Ecological Teaching and Learning graduate program. Using this survey, I was able to engage with the collective knowledge base of ETL alumni to investigate questions related to their practice. I used the survey instrument to discover how these

individuals currently teach ETL principles in various settings, as well as how they would like to deepen their ETL practice in the future.

Last, but not least, a few other key individuals participated on the periphery of this action research project. Two of my Lesley University graduate program peers and our primary action research professor offered their insight as critical colleagues in this work. Every other week, these individuals offered analytical perspectives, critical questions, and thought-provoking feedback that guided the final product of this action research report.

Review of Relevant Literature

My action research project seeks viable pathways to develop ecological teachers and learners through Project Learning Tree. This review will define the theoretical foundation of PLT and ETL and explore overlapping pedagogies between the two. Pedagogies that support PLT and ETL cannot be discussed without also detailing the current state of education and its strong emphasis on performance-based academic standards. At present, classroom implementation of PLT and ETL pedagogies depends on their perceived ability to increase student performance on standardized assessments. As such, this literature review will also discuss the benefits and challenges of standards-based education within the overarching context of professional development and environmental education theory.

Environmental Education: Enablers and Barriers

Environmental education is defined as the teaching of environmental issues that "provides opportunities for pupils to acquire awareness, knowledge, attitudes, skills, and experience that will enable them to make informed and responsible decisions affecting the natural and built environment" (Sosu, McWilliam, & Gray, 2008, p. 170). The future of the natural world relies on an educated public that is able to think critically about complex

environmental issues. In an attempt to support environmental education, PLT provides curricula that can be integrated into all grade levels and subject areas.

PLT is able to educate and inspire by leveraging the natural environment as a lens through which to study multiple discipline areas. Environmental education is used to increase students' ecological understanding, critical and creative thinking, ability to make informed decisions, and commitment to taking responsible action. Multiple studies confirm that PLT's inquiry-based, multi-disciplinary approach can improve student attitudes and aptitude (Covitt, Gomez-Schmidt, & Zint, 2005; Easton, 2011; Haines & Hermann, 2011). Studies conducted by the State Education and Environment Roundtable (SEER) consistently find that using the environment as a way to integrate otherwise unconnected subjects made a real difference to students and also permitted educators to engage in more team-based teaching (Coyle, 2010).

Although environmental education proves to be a successful pedagogy, it is not often exercised in American classrooms. Research conveys the complexity underlying teacher commitment to teaching environmental education. In theory, teachers are generally very interested in practicing environmental education, but implementation is often constrained by external barriers (Sosu, McWilliam, & Gray, 2008; Meichtry & Smith, 2007). These barriers include teachers' lack of ecological knowledge, materials, financial and human resources, and comfort in teaching potentially controversial issues. Additionally, a study by Sosu, McWilliam, & Gray (2008) found that the primary driver limiting the teaching of environmental education is the perceived "absence of teachers' control and autonomy over what and how they teach" (p. 182). While there have been a number of studies on barriers to implementation, fewer studies describe the factors motivating teachers to practice environmental education. However, four states (North Carolina, Kentucky, Texas, and Utah) do include environmental education as a

certification requirement for pre-service teachers, directly supporting the implementation of environmental education in those states' schools (Meichtry & Smith, 2007).

Certification programs, such as the four available for environmental education may "hold the best hope for making best practice standard practice" (Lozar, 2006, p.1). While certification programs have the capacity to create tremendous educational assets, such as professional learning communities with shared goals, some educators are curious if it is appropriate for the holistic field of environmental education to be reduced to a competency-based approach. Regardless of the answer, certification programs certainly contain common, positive program elements that characterize successful professional development. These elements include 1) extension over time, 2) creation of professional learning communities or cohorts, 3) mentors or experts to facilitate implementation, 4) customizable features, and 5) a pedagogical shift away from compartmentalization and toward interconnectedness (Lozar, 2006).

Ecological teaching and learning is not just a matter of pedagogy, but also philosophy. Ecological teaching and learning represents a new life-affirming mindset that all teachers—and, to a larger extent, all citizens and all Earth's human inhabitants—must adopt for a sustainable future. This philosophy embraces interconnectedness and systems thinking, challenging the Western notion of separateness. This type of teaching and learning develops and fosters an individual and collective "ecological consciousness" as humans move through life and relate to themselves, others, and the world around them (Uhl, 2003, p. 196). Practitioners of ETL seek a more holistic and participatory mindset than that which is traditionally offered by compartmentalized and reductionist Western theory.

Teaching Pedagogies: ETL and PLT

Many of the pedagogies of ETL overlap with those of PLT. Figure 1 on the following page organizes the 29 ETL pedagogies into three tiers that scaffold its philosophy. Since the integration of these 29 pedagogies into PLT is beyond the scope of this study, the Methodology section of this report explains how I engaged the advisory group to choose five for the focus of this study and the future of PLT's educational materials and professional development.

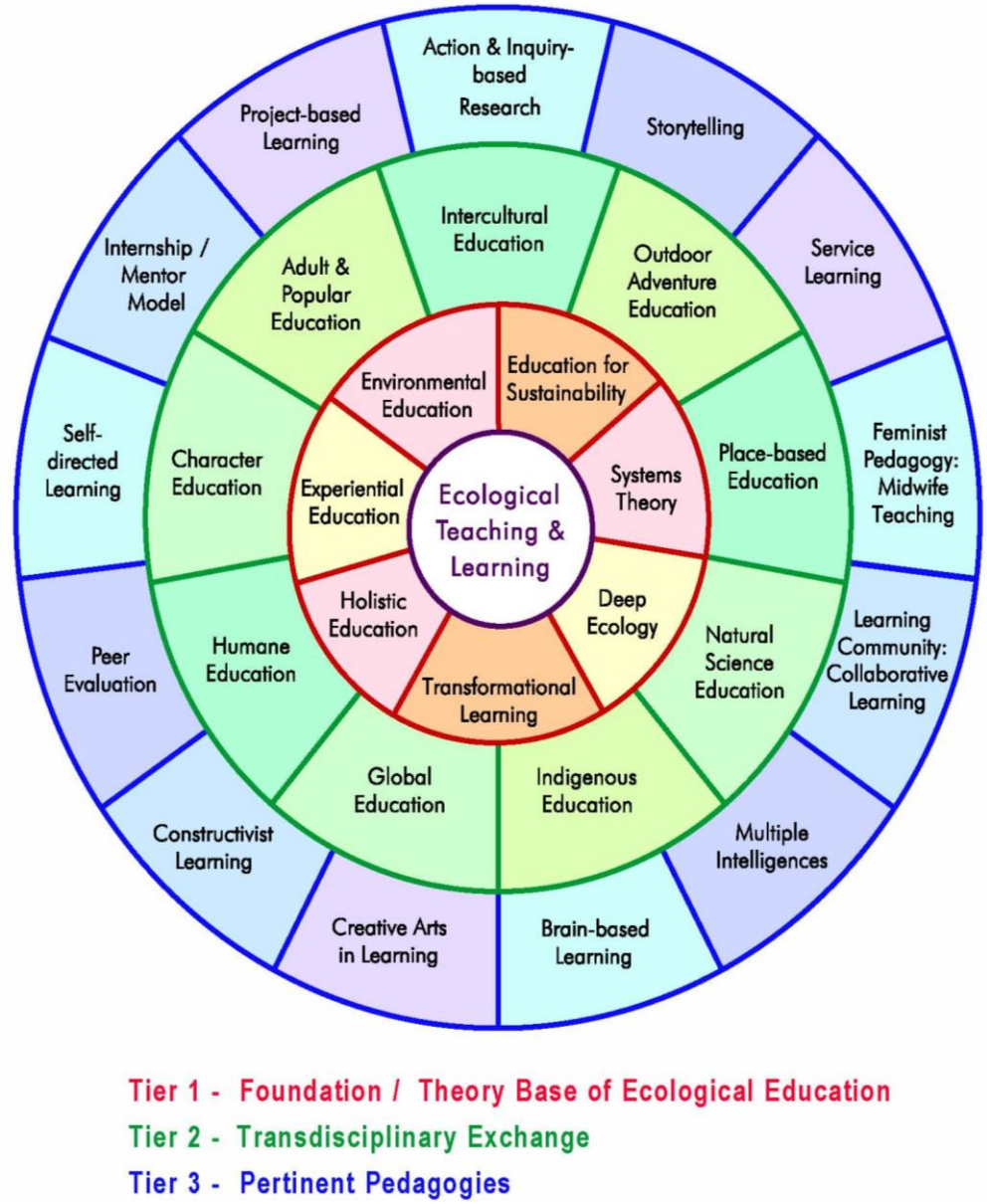

Figure 1. ETL pedagogy pie chart. This pictorial representation of ETL pedagogies is separated into the foundations (inner circle), transdisciplinary exchange (middle circle), and pertinent pedagogies (outer circle). Reproduced with permission from C. O'Connell, 2012.

Efficacy studies on the five selected pedagogies confirm the results of implementing environmental education discussed earlier in the paper, including increases in student achievement and attitude (Coyle, 2010; Hmelo-Silver, Duncan, & Chinn, 2007; Jennings,

Swidler, & Koliba, 2005). Implementation of these pedagogies yields desirable outcomes in students, such as the ability to link experience with theory. Through these varied pedagogical approaches, students are offered opportunities to apply acquired knowledge to novel situations, deepening understanding (Eyler, 2009).

Selecting only five pedagogies presents a difficulty because of the overlap that occurs with many of them. Further, reducing and simplifying the ETL theoretical scaffolding goes against the very strengths associated with the ETL philosophy my project seeks to promote. The nature of ETL is that it is broad, inclusive, and interconnected, as opposed to discrete, defined, and differentiated. However, I will use the five select pedagogies as a starting point to explore ways in which classroom teachers might begin to learn more about ETL pedagogies, exploring ideas for integrating it into their teaching practice using PLT.

Professional Development: Theory and Practice

Teacher professional development provides a means to share new teaching strategies with educators and support the implementation of these new strategies and ideas. Teacher professional development is largely understood as "any activity that is intended partly or primarily to prepare paid staff members for improved performance in present or future roles in the school districts" (Desimone, 2009, p. 182). Continued teacher learning has been identified as a key element to improving the quality of US schools (Desimone, 2009).

Teacher professional development benefits more than the individual instructor. Students also benefit when their teachers participate in professional development that focuses on new teaching strategies (Meichtry & Smith, 2007). Johnson & Fargo (2009) found a positive relationship between effective professional development programs and student outcomes. They write, "professional development efforts focused on standards-based instruction have been linked

to improved achievement for students in participating teacher classrooms across one school year on pre- or postassessments" (Johnson & Fargo, 2009, p. 8).

Figure 2 describes a theory of how teacher professional development influences teacher and student outcomes. Teachers first experience effective professional development, incorporating elements of the five core features, which increase teacher knowledge and skills. Improved knowledge and skills are then used to improve teacher content instruction, leading to instructional change that fosters increased student learning (Desimone, 2009). However, research that connects improvements in teacher practice resulting from professional development with improved student achievement is underrepresented in the literature.

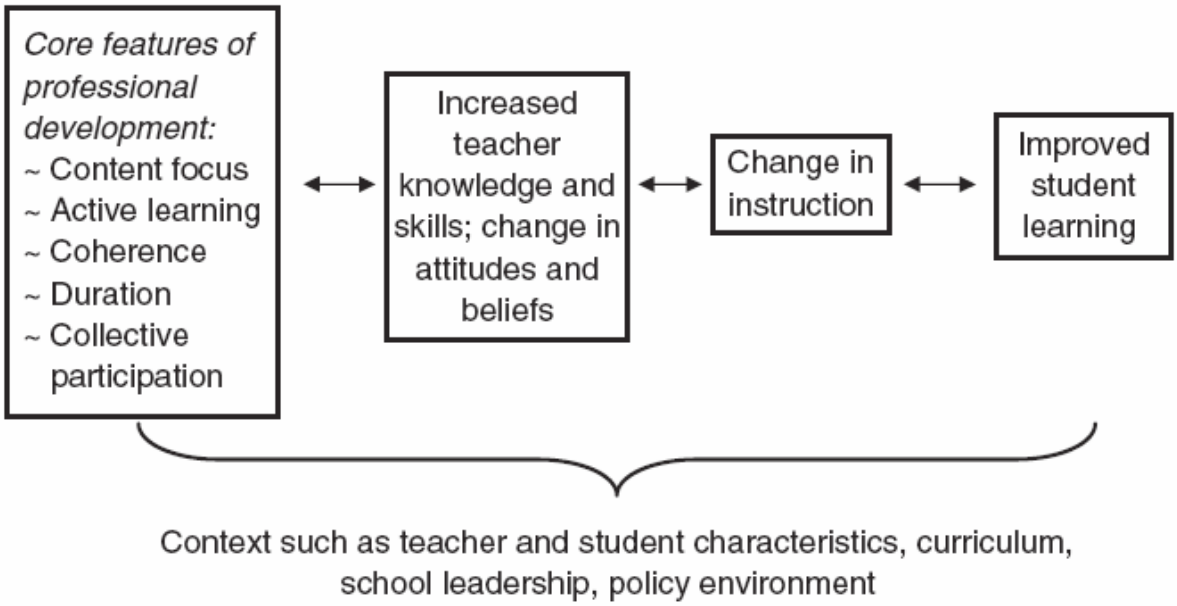

Figure 2. Professional development framework. This proposed core conceptual framework represents a model for studying the effects of professional development on teachers and students (Desimone, 2009, p. 185).

Many studies examine the efficacy of teacher professional development (Desimone, 2009; Johnson & Fargo, 2009; Meichtry & Smith, 2007). One particular study by Desimone (2009) identifies five core features that play important roles in determining the effectiveness of

professional development. Since PLT uses a professional development delivery system to distribute its curriculum materials, it will be essential to develop models that link PLT and ETL to the five core features of professional development:

- Content – focus on specific subject matter
- Active learning – teacher learning is engaged, not passive
- Coherence – the extent to which teacher learning is consistent with teacher knowledge and beliefs
- Duration – span of time over which the activity is spread and the number of hours spent on the activity
- Collective participation – participation of teachers from the same school, grade, or department (Desimone, 2009, p. 184)

This action research project developed an advisory group to explore the ways in which Desmione's five core professional development features might be applied to the integration of ETL and PLT. In addition to exploring professional development models, this advisory group assisted my investigation of how PLT's curricula might be altered to better support teachers' understanding, adoption, and transfer of ETL's philosophy to students.

A recent article from the National Science Teachers Association (NSTA) describes the advantage of allowing teachers the opportunity to practice what they are learning in professional development training. Practicing becomes possible as professional development is extended over time; it often occurs over multiple days, weeks, or months, and it features follow-up sessions ("Integrating STEM through PBL," 2013). More than changing teacher practice, these types of professional development models aid educators in incorporating new teaching techniques into their classrooms. To accomplish implementation, "teams are selected to build leadership," as this

article finds, “working in collaborative groups are an effective way to change what’s going on in school and engage teachers in professional development” ("Integrating STEM through PBL," 2013, p. 11). Since the largest hurdle to training and implementing ETL pedagogies is time, many of these professional learning communities are supported by online resources that educators can engage with on their own time, at their own pace.

After reviewing the literature, it is apparent that online community-creating tools, such as education forums and messaging platforms, are the most often cited support of sustained and extended professional development (Fishman et al., 2013; "Integrating STEM through PBL," 2013; Johnson & Fargo, 2009). One study by Fishman et al. (2013) compares online professional development to more traditional face-to-face trainings. In this study, both teacher practice and student outcomes were assessed for changes. Fishman et al. conclude, “teachers and students exhibited significant gains in both conditions… and that there was no significant difference in outcomes as a function of professional development modality” (2013, p. 2). A final, notable factor in this report is the presence of emotion. The study refers to a pedagogical approached called “Learning-for-Use,” which contains cycles of motivation and hope as essential factors in the success of teacher professional development (Edelson, 2001).

While the relationship between teacher professional development and student achievement is clear, it does not incorporate all of the factors that influence teacher practice. Even if the five core elements are expanded in PLT’s professional development delivery system, there is no guarantee that students will experience measurable knowledge and attitudinal change. There are simply too many other factors at play in the educational system to successfully measure the effects of incorporating the five core elements. These factors will be discussed in the following section, which explores how barriers to ETL implementation might be overcome.

Education Reform

The pressures on today's classroom teachers are significant. The No Child Left Behind Act (2001) emphasizes reading and mathematics to determine adequate yearly progress (Johnson & Fargo, 2009). A performance standard that focuses on reading and mathematics has had the unintended effect of deemphasizing science instruction, leading teachers to adopt a narrowed curriculum that supports students' preparation for multiple-choice standardized tests (Brown, 2010). The content of these exams plays a significant role in dictating teachers' daily instruction, and the pressures to do well on these tests drive teacher instruction and student learning.

Teachers view it as essential that they teach their mandated curriculum (Brown, 2010; Schmoker, 2011). In a 2010 study examining the effects of Texas state standards on teacher practice, a preservice teacher insists that "everything is about developing strategy for the test" (Brown, 2010, p. 485). This means that, to be successful, any PLT or ETL curricula and professional development must be explicitly tied to high-stakes, standards-based educational mandates.

There are few studies that successfully link environmental education to existing education mandates, a primary reason for my inquiry in this area. My action research project seeks to reveal actionable forays into this challenging area. One SEER (State Education and Environment Roundtable) report describes a study that linked student exposure to environmental education to increased academic achievement in reading, writing, math, science, and social studies (as cited in Coyle, 2010). This study offers hope for additional pathways connecting PLT pedagogies and ETL philosophy to standards-based education.

Over the past several years, Achieve, Inc. has led the design and development of the new national standards for science education. Named the Next Generation Science Standards (NGSS)

and released in the spring of 2013, these standards influence the structure of science classrooms across America. As of November 24, 2013, a total of seven states have already adopted NGSS and are designing three to five year plans to implement them (personal communication, S. Pruitt, October 13, 2013). NGSS is characterized by systems thinking, contextualization, and content depth. *NSTA Reports* states, "The first step in teaching NGSS is to start with the big idea" ("Putting NGSS Into Practice," 2013, p. 16).

Teaching NGSS rests on the idea of making connections, which is, in part, why the standards are organized by "cross-cutting concepts" (National Research Council, 2013, p. 1). These concepts are transdisciplinary as they have the ability to move across, through, and between disciplines. They are overarching ideas, such as patterns, causes and effect, scale, and systems (Dhar, 2013). While this development is exciting for ETL and PLT educators, these facts do not exactly jump off of the NGSS page. This knowledge will need to be transferred to teachers through appropriate professional development venues.

This literature review has helped me understand the tension that classroom teachers face. In the most basic terms, I see teachers as standing at a fork in the road. To their right is a path down which classroom learning is dictated by academic standards and to their left is a path that embraces the proven pedagogies of ETL. At this point in time, it seems as if teachers have only two choices for classroom instruction: standards or pedagogy; right or left.

On the standards-based path, teachers are limited by pressure from principals, superintendents, and other school administrators to teach specific assessment-related content (Sosu, McWilliam, & Gray, 2008, p. 179). The focus on student test performance causes teachers to pass up using other proven pedagogies because a school's standardized test scores are the only recognized measure of teacher effectiveness (Coyle, 2010). While education policy and school

administrations support and promote this path, I found statistically significant studies connecting standardized test scores to teacher effectiveness to be absent in the literature.

On the pedagogies path, classroom teaching embraces the whole child. The engagement of multiple and varied pedagogies used here results in proven learner benefits: employment of native intelligences, improved interpersonal communications, and increased test performance, motivation, and enthusiasm (Coyle, 2010). This scaffolding reduces students' "cognitive load" while still allowing learning in "complex domains" (Hmelo-Silver, Duncan, & Chinn, 2007, p. 99). On this path, students become co-creators of their own knowledge, with teachers acting as facilitators of student-designed inquiry. The process of gaining knowledge is seen as more important than the goal of knowing information. A recent Education Week (Klein, 2010) article suggests that the overall education picture may be shifting toward a renewed emphasis on educating the whole child versus relying entirely on standards-based testing. This path, however, is inconsistent with the current education system's standards-based effectiveness measure.

One of these paths is not better than the other, and they are not incompatible. While I would fully embrace major reform of the American educational system, I remain practical at heart. In this spirit, I believe that my action research project will present an option for transforming this fork in the education road into a four-way intersection. Instead of choosing right or left, I hope that my work with PLT using an ETL philosophy can forge a path straight ahead, incorporating the strengths of both sides.

Through this research, I explore how to work within the confines of the current education system to provide PLT teachers with new tools to practice ETL in classrooms across the country. I believe that embracing an ETL philosophy can be used to limit the current focus on content and assessment, instead highlighting the methods, environment, and materials that are also essential

to success. I see this new path as using elements of successful education pedagogies to achieve mandated academic standards, combining the strengths of both sides. I strive to incorporate ETL's philosophy and pedagogies with PLT's educational resources and professional development delivery system to create a new path forward.

Methodology

One of the primary purposes of conducting action research is to incite and induce action. This action, however, is not without purpose. This action aims not only to yield knowledge but also to model how new knowledge is created (Mills, 2011). In undergoing this action research project, I demonstrate a culmination of my learning as a graduate of Lesley University's Ecological Teaching and Learning Masters Program. I am applying my knowledge to my teaching practice. In doing this work, teacher-researchers, like myself, validate their practice and learn more about the craft of teaching.

Approach

With the ultimate goal of affecting positive change, action research helps teacher-researchers to determine meaning for their endeavors (Reason & Bradbury, 2006). Action research is empowering because the subjects, the process, and the results are important and useful to the practitioner. I will, for example, be able to apply the conclusions of this project to my work as Manager of Education Programs for Project Learning Tree. Further, action research provides a means to conduct collective inquiry *with* and *for* people (Reason & Bradbury, 2006). As this project engages PLT stakeholders and experts in the field (ETL alumni), this project benefits the practitioner (me) in furthering the professional and personal goals of revising PLT's curriculum design and delivery and creating a more ecologically conscious world.

I understand action research as part systems theory, part experiential learning, and part transdisciplinary pedagogy. Action research would not exist without the experiential; the "being;" the "doing" of the teacher-researcher (Grant, 2007, p. 265). This experiential "doing" is under constant adaptation and revision as the research project unfolds, often leading the teacher-researcher in unexpected directions. While experiential learning changes based on the environment and new findings, systems theory suggests that systems are interconnected and modifications in experiments will potentially have second- and third-order effects. The processes by which these systems act and interact remain the same unless new variables are added. This systems experiment is transdisciplinary as it reaches "across and beyond boundaries to encompass practices from many disciplines" with the goal of enduring change to better society (Grant, 2007, p. 266).

Holistic in its approach, the process of action research is evolutionary by design. Its cyclical, malleable, dynamic methodology is akin to a living experiment. This biotic design demands that teacher-researchers be able to both acknowledge and embrace experimental complications as they arise and then cycle through action, reflection, planning etc. again and probably again. Figure 3 represents the problem-solving strategy of action research as repeated cycles through the steps of planning, taking action, analyzing, and reflecting.

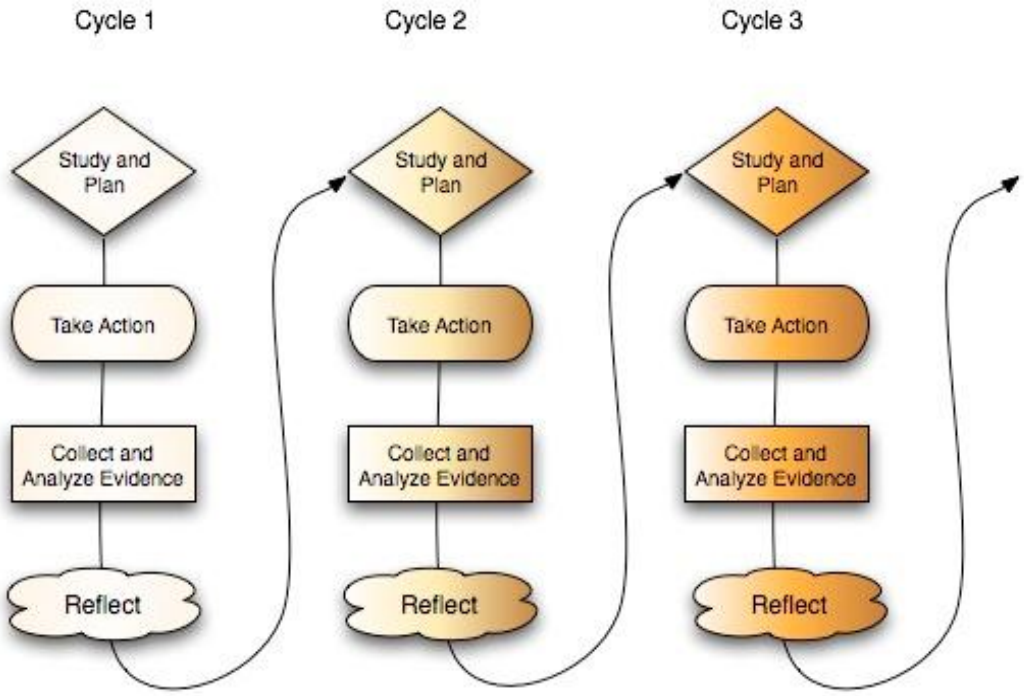

Figure 3. Action research cycles. This flow diagram describes problem solving with action research through repeated cycles of planning, taking action, analyzing, and reflecting (Riel, 2010).

This action research project experienced a total of four cycles. One cycle occurred with each of the three PLT advisory group conference calls, and the last cycle is associated with the ETL alumni survey creation, distribution, and analysis. All of these cycles required action, data collection, and reflection on the following three ideas: ETL/ PLT pedagogy overlap, ETL alumni survey design and delivery, and new models for PLT's pre-k – 8 curriculum and educator professional development. Throughout these cycles, I considered the eight PLT advisory group members as co-researchers of this project.

Action research represents more than a methodology; it is a way of being in the world. As an action-researcher embedding this practice into everyday problem-solving, I am doing my part to create a more participatory worldview. This worldview is one in which citizens have active

roles in creating their own knowledge. This level of engagement and experience is democratic and life affirming, and in this way, action research can be considered more of a verb than a noun (Reason & Bradbury, 2006). The varying degrees of action research represent a continuum of steadfast ideals. While some action research projects are more democratic than others, their core values remain unchanged. I see this project as being placed somewhere in the center of the action research continuum. While this project embraced participation and democracy with the engagement options provided by both the advisory group conference calls and ETL alumni survey, in my role as teacher-researcher, I was continually directing (and therefore also limiting) discussions with the agendas I set, questions I posed, and datasets I presented.

Data Collection Methods - Primary

Two primary actions served as the foundation of this project. The first action was the creation and engagement of an advisory group, which was composed of eight PLT content experts. The second action was the creation, distribution, and analysis of a questionnaire to engage the Ecological Teaching and Learning audience. The survey was completed by ETL program alumni and analyzed by the PLT advisory group. The survey findings were reviewed by all PLT advisory group members, and final recommendations were made on actions Project Learning Tree can take to develop ecological teachers and learners through its educational materials and professional development delivery system.

In order to convene a diverse and balanced advisory group, I hand selected invitees based on my long-term role as Manager of Education Programs with the National PLT program. These individuals represent the varied stakeholder roles within the diverse PLT network of partner organizations, have varying degrees of experience with PLT, and showcase geographic diversity and gender equity. I also made a conscious effort to consider individuals representing

demographic variations, as I wanted to ensure the advisory group contained voices from urban, suburban, and rural areas, as well as ethnically and economically diverse communities. Figure 4 is a United States map, which highlights the states of my advisory group invitees, and Appendix A contains a full list of invitees, including their names, organizations, and contact information.

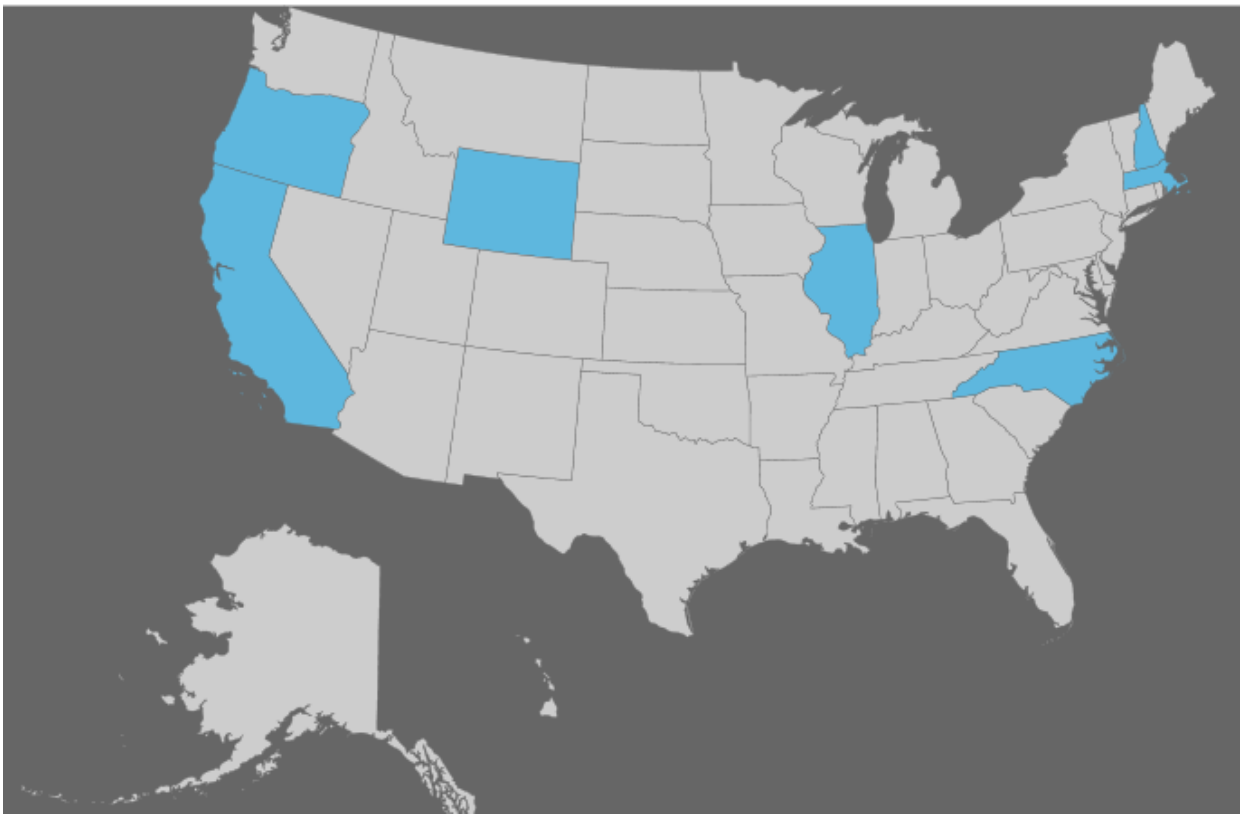

Figure 4. Advisory group members' state representation. This United States map highlights the states from which my action research project's advisory group invitees represent (CA, IL, MA, NC, NH, OR (2), WY).

Advisory group members were contacted to participate in this project via an email invitation on Tuesday, August 27, 2013. This email offered a brief introduction to this action research project, an invitation to participate, and a survey to identify the best date and time to host the first conference call. It was understood that by completing the survey, invitees offered their consent to participate in the project (see Appendix B to view this email invitation).

This advisory group convened three times via three conference calls to discuss this project's sub-questions, as well as data collected from other research methods. The conference calls were hosted monthly, one in September, one in October, and one in November, and their duration was limited to one hour each. The conference calls were audio recorded so that the conversations could be revisited later, as questions were raised or content needed to be clarified. I used the ReadyTalk conferencing system to host the calls. This tool is available to me through employment with Project Learning Tree, and allows capabilities such as screen sharing and audio recording, as mentioned earlier. The co-researchers were also engaged in email conversation between the scheduled conference calls, to further collect and refine their insights, opinions, and ideas. The main responsibilities of this group (and thus the topics of the three conference calls) were to identify pedagogies with significant PLT and ETL overlap, analyze the ETL alumni survey data (see *Third Cycle – ETL Alumni Survey*), and explore viable models for incorporating ETL pedagogies into PLT's educational materials and educator professional development.

During each of these three scheduled calls, I asked participants to take notes on the conversation. This alternative data collection method offered valuable perspectives outside of the teacher-researcher (myself), and thus helped to remove bias and uncover new vantage points. I always asked the co-researchers to submit their notes to me electronically (via email) after each conference call. These notes were then coded for common themes, emotions, and new ideas, and this information was returned to them for review. The results from these calls are explored in more detail below.

Data Analysis and Findings

In the sections that follow, I have organized the data analysis sections into the four sequential action research cycles. Since findings naturally flow from these data, I have included

the findings for each data analysis with the appropriate cycle. I consider data analysis to be a report out of the data collected and findings to be the meaning I make from it, as the teacher-researcher. The reminder of this Methodology section organizes and articulates this information (data analysis followed by findings) for each of the four action research cycles. The Methodology section closes with a summative Conclusions section that makes meaning out of the collective findings generated by the four action research cycles.

First Cycle - Conference Call 1

The first advisory group conference call was hosted on Monday, September 16, 2013. To prepare and plan for this call, I organized a Doodle Poll for participants to identify their availability, I created an agenda to guide the discussion, I shared supporting documents that would be referenced on the call, and I distributed instructions for dialing-in, screen sharing, and taking notes. Appendix C contains an email that was distributed to the advisory group a few days prior to the call, and describes these items in additional detail.

On the first conference call, I introduced the advisory group to the idea of Ecological Teaching and Learning. I defined the term in my own words and supported the definition with a visual that detailed a written definition of ETL, my main action research question and supporting sub-questions, and an introduction to the ETL pedagogy wheel (to view a copy of this document, see Appendix D). After reviewing this information, I asked each advisory group member to identify the five ETL pedagogies they believed had the most overlap with teaching techniques employed by Project Learning Tree. The results of this inquiry are represented in Figure 5.

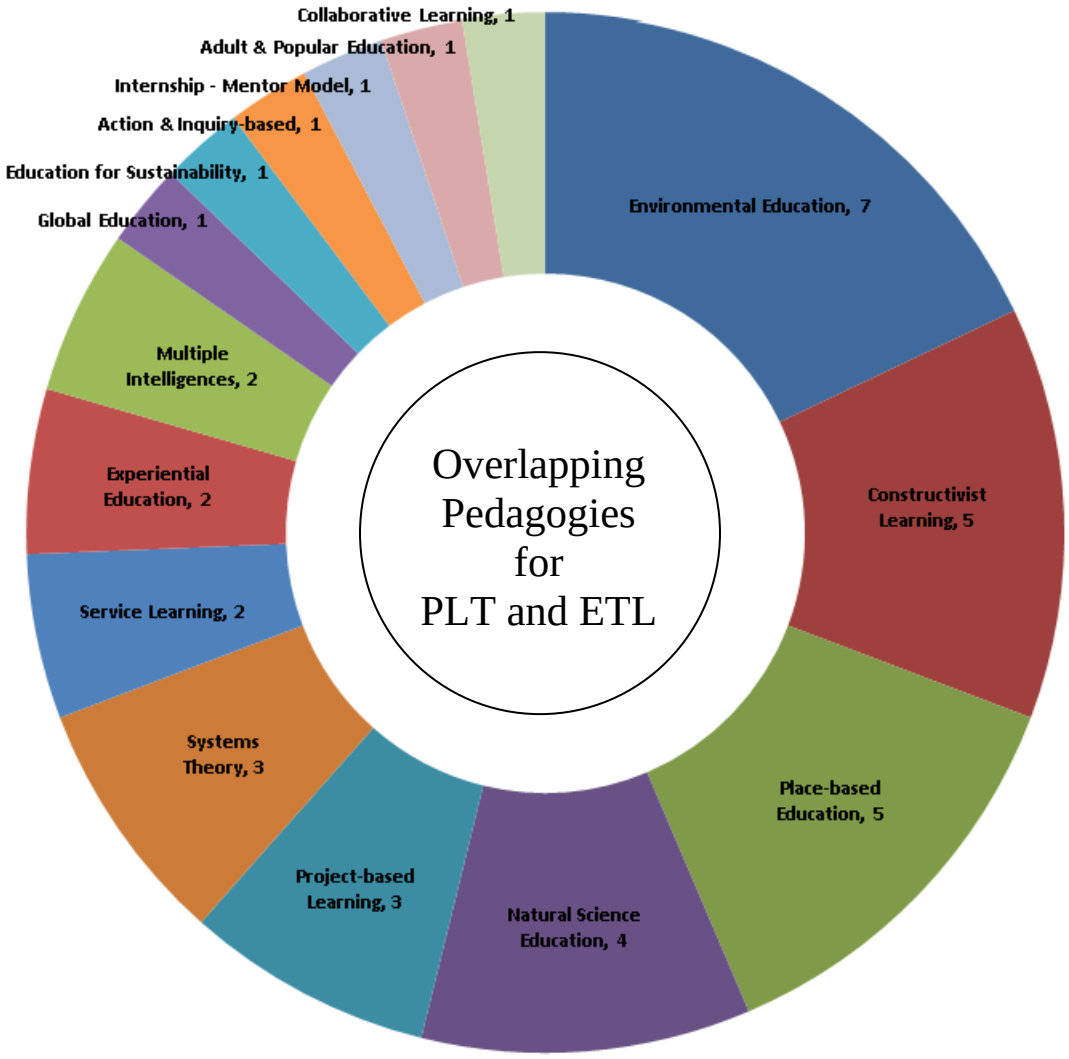

Figure 5. Votes for overlapping PLT/ETL pedagogies. Members of the advisory group identified these fifteen pedagogies as currently present in PLT programs and educational materials.

The pedagogies identified by the advisory group as having strong overlap with PLT programs and educational materials include environmental education [7 respondents], constructivist learning [5], place-based education [5], natural science education [4], project-based learning [3], systems theory [3], service learning [2], experiential education [2], and multiple intelligences [2]. The remaining six pedagogies identified received one vote each and

they include: global education, education for sustainability, action and inquiry-based education, internship – mentor model, adult and popular education, and collaborative learning. This information proved essential as I moved forward with my action research project. I almost understand this investigation as a SWOT analysis (strengths, weaknesses, opportunities, and threats) of the PLT program, in terms of its ability to convey the concepts of the full ETL pedagogy wheel (Figure 1, p. 15) in both its educational materials and professional development offerings. A SWOT analysis organizes the information from an organization's environmental analysis and separates it into internal (strengths and weaknesses) and external issues (opportunities and threats). Once this is completed, a SWOT analysis can determine what may assist an organization in accomplishing its objectives, as well as identify what obstacles must be overcome or minimized to achieve desired results (personal communication, D. Chase, October 2, 2013).

I found it no surprise that the number one PLT pedagogy was environmental education. After all, PLT markets itself as "an award-winning *environmental education* program designed for teachers and other educators, parents, and community leaders working with youth from preschool through grade 12" (emphasis added, Project Learning Tree, 2013, p.2). As for some of the other popular pedagogies identified by the advisory group (constructivist learning, place-based education, project-based learning, systems theory, service learning, and experiential education), they are defined and employed in some capacity in PLT's educational materials and professional development workshops. PLT also prides itself on meeting mandated education standards, such as the National Science Standards, which is why I believe natural science education also rose to the top. Finally, PLT touts two service-learning programs (GreenWorks! and GreenSchools!), as well as employment of eight differentiated instruction techniques, which

I believe are responsible for the identification of service learning and multiple intelligences as pedagogies of overlap. The remaining six pedagogies identified have varying levels of visibility, but for the most part, they are restricted to PLT's high school materials, which are overall less commonly used across the United States. This information offers a firm foundation for inquiry related to the upcoming action research cycles.

As mentioned earlier, one of my data collection methods is to ask advisory group members to take notes during the conference calls. This proved invaluable, as I was so preoccupied hosting the calls that I barely took any worthwhile notes myself. Plus, their individual entries revealed new perspectives, ideas, and questions for further exploration. I was also thrilled that everyone submitted a copy of their notes – 100% compliance was not anticipated!

At first, I struggled with how I might code these data. Chapters in Dana (2013) and Mills (2011) helped me to consider how I might better organize this information. I first had to set aside a block of time to read and reread the information gathered, in order to really familiarize myself with it. As Mills articulates, action researchers must move beyond being familiar with their data to fully understanding it; "you must know your data – really know it, in your head, not just on paper" (2011, p. 127). This intense data review led me to begin identifying themes and patterns in commentary, which I then categorized into groups. In addition to coding for content patterns, I also coded for reoccurring emotions and new ideas expressed.

I chose to code for emotions because I understand education as a balance between intellect and emotion. This balance is essential for both teachers and learners. If teachers are not passionate about what they are teaching, I believe this has a negative effect on student knowledge gains. Conversely, if students are not emotionally invested in their education, I doubt

their ability to retain knowledge and information beyond the testing period. As I have said before, my education work is not only my job, but also my passion. I cannot speak for my co-researchers, but I believe many of them would feel the same way about the work they do. I thought that coding for their emotions expressed during the conference call conversations might help unearth new vantage points, sensitivities, and areas of interest. Coding for emotions would also show if this project has the power to continue after the 10 week timeframe and generate enough excitement and interest for full integration into my PLT workplan.

I organized the emotions expressed into thoughtful/ reflective [9 comments], positive [5 comments], and questioning [4 comments]. To clarify these emotional categories, I will provide an example for each. A comment categorized as thoughtful/ reflective reads, "PLT could use more intercultural, mentor model, global, and outdoor education." Positive responses were easy to identify, and they often included complimentary, such as, "sharing of a definition of ETL was a great start to help us get on the same page." The questioning comments are indicative of deeper thought process, of advisory group members' struggling with the difficult questions being raised by this action research project and an example includes, "How can an educator cover all the different facets of ETL?"

The final coding category represents a collection of the new ideas expressed in the notes submitted by advisory group members. For the most part, these new ideas ask questions that, if pursued, could either change the course of the action research project or pose potentially insightful solutions to my main and sub-questions. This information has been distilled into bullet form and reproduced below:

- Should a sub-question related to environmental literacy be added?
- Organize the alumni survey into current ETL situation and desired ETL situation

- Is the ETL Alumni Survey a SWOT analysis of ETL in practice?
- ETL is pedagogy and philosophy (way of doing and a way of thinking)
- Should we also explore the ETL pedagogies with the weakest connections to PLT?
- Can pedagogies be added to PLT Appendix and/ or the PLT activity sidebars?
- Environmental Educators tend to focus/ lean on different pedagogies at different times
- The concept that "sustainability" involves three elements (environmental, social, economic) both fits well with PLT's balanced educational approach, as well as the broad ecological view taken by ETL.

These ideas offered me guidance as I moved forward with this project and began to draft the ETL alumni survey. I also spent time on the conference call generating ideas for information to gather and questions to include in the survey. I took notes on my computer screen, which was made viewable to all participants, and the list generated is included in Appendix E.

Overall, I was pleased with the participation, genuine interest, insight, and excitement generated by this first advisory group conference call. We moved through all agenda items on task and on time. I learned that to manage this successfully, conference calls require an agenda and preplanning on how much time is to be allotted to every agenda item. It is essential that conference call hosts stick to the time allotted for the task. Reminders are essential and supporting documents are also helpful. Any preparation that participants can do in advance of the call is appreciated, but cannot be expected, as these individuals are participating in my action research project on a volunteer basis. One final conclusion for this first call is that people enjoy collaborating with one another in order to learn new things. This was apparent to me as the call facilitator, due to the high level of engagement, excitement, positive emotions, and willingness to

participate exhibited by all co-researchers. This insight will resurface in my final project conclusions.

One complete action research cycle is reflected within these experiences. This first conference call experience followed the flow chart outlined in Figure 3 (p. 25): study and plan, take action, collect and analyze data, and reflect. In this case, it was necessary for me to first study and plan for the conference call as I created supporting documents and planned an agenda. The action component was the facilitation of the first conference call. Conference call data was collected via participant notes and an audio recording, and the corresponding data analysis was previously detailed in this section. Reflecting on this experience took place in my professional journal, articulating the findings above, and bi-weekly updates to my critical colleagues. The results of this first cycle also served to influence the second action research cycle, which hinges on the second conference call.

Second Cycle - Conference Call 2

I hosted my advisory group's second conference call on Tuesday, October 8, 2013. When I confirmed the date and time for the second call, one participant informed me of a scheduling conflict. Since this individual was unable to participate in the group call, she kindly offered to make herself available to me on a different date and time so that she could still participate and provide feedback on my project's progression. This individual conversation took place on Thursday, October 3, and it was the perfect stepping stone to further advance my ETL alumni survey draft for the advisory group's second conference call scheduled for the following week.

The agenda for the second conference call was focused on three tasks. First, I took the time to review a summary of my findings from the first conference call. This included sharing the findings from my coding efforts, as we reviewed the major themes, common emotions, and

new ideas proposed. We did not spend much time here, since this was primarily a review of our accomplishments to date. This discussion did, however, set the stage for the following two agenda items. The task we spent the most time on was working through the draft of the ETL alumni survey. A majority of the conversation was centered around the questions that should be directed towards ETL experts in order to help inform decisions we would later make in regards to PLT's educational materials and professional development offerings. The advisory group participants not only helped me work thorough possible questions to ask in the survey, but they also worked with me to consider the best format to ask these questions. For example, we had many debates over the pros and cons of multiple choice, Likert scale, and short answer questions for the questions we proposed. Our final task for this call was to revisit this project's main and sub-questions. We spent time discussing their relevancy in light of new information gained and our conversations to date.

I decided to take a slightly different approach to the note-taking assignment for the second conference call. As the facilitator, I felt as though advisory group members were much less verbose on this second call. In attempt to gather the input I desired, I decided to assign three "action items" (or homework questions) for participants to answer and submit, along with their notes. I sent an email communication after the second conference call that articulated the three action items (see Appendix F*),* and the relevant responses are included in my analysis of the second conference call (below).

I was interested to see if this additional request to respond to action items would delay or deter conference call participants from submitting their notes. While this additional request caused a delay in submissions, I still received notes from everyone on the call. Further, one of my advisory group participants was affected by the government furlough in early October

(2013), and thus was unable to participate in the second call or submit traditional notes. Offering the action items actually allowed her to participate when she would have otherwise been unable, as she reviewed the questions and submitted her responses once she was back to work.

Overall, the notes from the second conference call were much harder to code than the responses from our group's first conference call. I found myself relying on Mills' advice: "There is no substitute for taking time to fully immerse yourself in your data. Literally bury yourself in what you have. Read and reread, listen and relisten, watch and rewatch" (p. 129). For two days, I sat in a pile of print outs, where I sat and read and reread, cut and pasted, organized and reorganized. In making sense of the data, I tried to take the same approach that I did for the first conference call, which was coding for common themes, emotions, and new ideas. I must admit, however, that the notes from the second call were simply "messier" than the notes from the first. This is evidence that my advisory group members are comfortable, interested, and invested in my inquiry. They are exploring potential avenues and ideas for me to make my project even better. They are beginning to think much more independently about my project and additional questions our inquiry raises. This is indicative of the cycling nature of action research projects. As new information is unveiled through inquiry, new questions are raised, and the larger conversation continually oscillates between convergent and divergent thinking.

In my analysis of the second conference call, I identified four overarching themes and organized all commentary into these categories, as appropriate. The four overarching themes include opinions, clarifying questions, suggestions, and new wonderings. I will explore the results from this analysis before also reporting on the results from coding for emotions and new ideas.

After coding the notes from the second conference call, I identified a total of six opinion statements. Two of the opinion statements were related to the importance of any PLT and/ or ETL resources' alignment with current education trends. In these two opinion statements, specific reference was given to the Common Core State Standards, the Next Generation Science Standards, and STEM education (science, technology, engineering, and math). The remaining four opinion statements cannot be easily grouped, and thus have been summarized in bullet form:

- "PLT is overlooked as a pedagogy; it is most often recognized as teaching activities"
- "I don't feel that PLT is the place for outdoor adventure education. I feel like EE [environmental education] in general has this identity problem and including it [outdoor adventure education] in PLT would be problematic."
- "Just focusing on the intersection of pedagogies will be the essential and invaluable outcome [of this project]."
- "It is not easy to effectively use an advisory group."

These opinions suggest the value of improving Project Learning Tree's focus on pedagogical strategy. The data suggest Project Learning Tree shift its focus on activity content and transition and place more emphasis on teaching methodology. The conclusions of my project will make recommendations on the ways in which Project Learning Tree might effectively make this transition, in terms of both its education materials and professional development.

Coding the data allowed me to identify questions raised by conference call participants. I identified a total of four clarifying questions. Two questions were raised by the same individual and the other two questions were raised by two different participants. I have detailed these clarifying questions below, and organized them by the individual that asked them (Questioner A, B, and C):

- Questioner A
    - “Is your survey demographic affiliated with early childhood?”
    - “What if [survey] participants reply they are not familiar with PLT? Does this count them out?”
- Questioner B
    - “What does ‘coding for emotions’ mean?”
- Questioner C
    - Have the National Science Standards and National Social Studies Standards been replaced by NGSS?

I was glad to receive these questions in the participant notes, since the individuals who raised them did not find the time or space to express them during the one-hour conference call. I was then able to address their questions, by either telephone or email conversations. These questions made me realize that the process of my action research is not as clear to others as it is to me, as the teacher-researcher. To me, this uncertainty warrants three things: 1) repetition, 2) consistency, and 3) mixed media. I have learned it is essential to repeat the most important components of a message, process, or intention. It is, however, no use if the repeated messaging is not consistent. Clear and concise messaging helps communication efforts be consistent. Finally, these repeated and consistent messages must reach audiences in a variety of ways. To be specific to this project, I offered the same content multiple times using mixed media, which included audio and visual (text and pictorial/ graphic). These questions raised were also a healthy reminder that this project’s co-researchers all have different experiences and varying levels of familiarity with the topics discussed.

The data revealed a total of nine suggestions from five different conference call participants. Six of the suggestions related specifically to the design of the ETL alumni survey instrument, two of the suggestions related to managing an advisory group, and one suggestion related to a possible new sub-question. These suggestions proved invaluable as I finalized the ETL alumni survey questions and prepared for this project's third and final conference call. The nine suggestions are articulated in detail below:

- Suggestions related to ETL alumni survey
    - "Should survey participants receive a PLT guide (or activity sample) to review, familiarize, and/or assess?"
    - "Should the survey provide background material (include pedagogy wheel and briefly summarize each)?"
    - "Constraints are obvious (time, money, support) – perhaps consider a Likert scale response?"
    - "Try to incorporate a follow-up question: If no outside curricula are used, why not? What might make you consider their use?"
    - "Consider incorporating N/A response to some survey questions."
    - "Organize your survey into Conceptual EE and Operational EE (*why* you do it and *how* you do it)." (emphasis original)
- Suggestions related to advisory group management
    - "When all else fails, go around the table [for thoughts, ideas, suggestions, etc.]"
    - "Use your authority to make critical decisions"
- Suggestions related to a possible sub-question

- "A good sub-question might be: How can a core set of ETL pedagogies be best incorporated into individual PLT activities?"

I named the final overarching theme "new wonderings" because the ideas expressed with these comments are indicative that more research is needed. These "wonderings" exceed the scope of this action research project, and as such offer merit to the significance of the inquiry it contains. A total of three individuals offered five new wonderings, apt for future consideration. These comments are organized by the individual that submitted them (Wonderer A, B, and C).

- Wonderer A
  - "I wonder if it might inform your research to expand the sample of people who would contribute to the model of overlapping pedagogies for PLT/ ETL?"
  - "How can a focus on ETL improve PLT's ability to support teachers in creating (scientific/ ecological) *learning communities*?" (emphasis original)
  - "How does one asses and/or evaluate ETL outcomes? How does one asses PLT outcomes? How do they differ?"
- Wonderer B
  - "What if you selected one activity and surveyed them [ETL alumni] on the missing/ present [ETL] components and perhaps [added] a Likert scale to [identify] the percentage that the activity represents ETL?"
- Wonderer C
  - "Maybe something to look at is how STEM and NGSS link to the key ETL components that come out of the survey."

The next component of the second conference call analysis included coding for common emotions, and a thorough review of the data revealed the presence of six. Conference call

participants articulated a total of 28 emotive comments; 12 comments (or 43%) were positive, 7 comments (25%) were confused, 4 comments (14%) accurately summative, 3 comments (11%) offered availability for follow-up, and 2 comments (7%) were ambivalent. Of the seven individuals that participated in the second conference call, I would conclude that four of them exhibited less emotion in their notes, as they proved to be more content-heavy. Two participants exhibited much more emotion in the notes from the second conference call, offering much cheerleading and encouragement. One participant's notes were extremely narrative in nature, and detailed not just the participant's own thoughts but also the flow of the entire conversation ("First, Jackie presented X, and then we discussed Y, etc.").

The final dataset defines the new ideas generated by the second conference call. In this dataset, 13 comments are organized into three new ideas. The three new ideas include creating an organizing tool for incorporating ETL pedagogies into PLT activities (6 supporting comments), incorporating ETL elements into PLT professional development models (5 supporting comments), and identifying the weakest ETL/ PLT pedagogy connections (2 supporting comments). These new ideas represent the onset of tangible insight into my original inquiry. They will serve as the foundation to my overarching conclusions and thus be further defined later in this report.

Immediately after facilitating this second conference call, I felt discouraged with its execution. After reviewing the notes, however, and the analysis that followed from them, I was reminded that this is action research. While action research is messy work, it became clear to me that my co-researchers are invested in this inquiry, as they continue to explore new ideas, wonderings, and questions worthy of additional research. This is evidence that the co-researchers

were developing a sense of ownership of the action research process, as well as the results it generated.

Facilitating this second conference call allowed me to learn even more about effectively managing an advisory group. I learned that reviewing and discussing meticulous details is not wise on a conference call with seven voices. For example, instead of trying to parse out the last third of the ETL alumni survey, I should have kept the group's conversation larger, with the main focus on the large, overarching ideas. The truth is, however, that stepping back and seeing the bigger picture was really difficult for me to do at the time, as I was in the middle of all the details associated with my project's data collection and analysis. This perspective is important to keep in mind when managing teamwork.

I have learned that this PLT advisory group functions better when generating and collecting big ideas, as opposed to confronting this project's many details. When I need help with scrupulous questions and issues that arise, I have learned to rely on the talents of advisory group participants individually. Another thing I need to remember is to trust myself to make good decisions. At this point, I am the one who knows my project the best, and I should not underestimate my own knowledge, insight, and abilities.

A second complete action research cycle is reflected within these experiences. Again following the flow chart in Figure 3 (p. 25), I studied and planned to prepare for the second conference call, took action by facilitating it, collected and analyzed the associated datasets, and reflected on the experience. The results of this second cycle serve to influence the third action research cycle, which hinges on the development and distribution of a survey to ETL program alumni.

Third Cycle – ETL Alumni Survey

With the help of the co-researchers in the advisory group, I developed a survey for current students and past graduates of Lesley University's Ecological Teaching and Learning Master's Program. This survey was intended to engage ETL "experts," and collect insight they possess relevant to the questions of this action research project. The survey questions were crafted to reveal the most effective ways in which ETL graduates are using ETL pedagogies in their practice, as well as identify the various support systems required for the successful implementation of ETL. The survey analysis identifies many barriers and enablers to teaching ETL that will help inform the design and delivery of PLT's new *PreK-8 Environmental Education Activity Guide.*

The survey questions were organized into two main content areas related to participants' ETL practice: *current* and *desired.* By asking ETL alumni about their current ETL practice and their desired ETL practice, my survey attempted to further define the existing gap between ETL in theory and ETL in practice. My project seeks to further articulate and understand this gap so that I might explore how PLT materials might help to fill it, using both its educational content and professional development delivery system.

The quantitative nature of the survey data offered a more straightforward analysis than the notes from the conference calls. However, the survey also contained several open-ended questions, which called for similar coding to the qualitative conference call notes. Dana comments that "it's important to look at the quantitative data in different ways" (2013, p. 56). As such, it will be necessary to creatively manipulate the quantitative responses (Dana suggests "play with your data") to dig deeper into my inquiry and further elicit meaning from the data

collected (2013, p. 55). All survey responses were collated and analyzed using Survey Monkey tools.

I found that massaging the big ideas for this ETL alumni survey generated by the advisory group's first conference call (see Appendix E) into clear, concise, and measurable survey questions was not easy. To help with this task, I used the one-on-one conversation with a single advisory group member (see p. 35, which references this October 3 conversation) to transform the survey's big ideas into more qualitative, measurable inquiries that would be appropriate for the survey tool. To accomplish this, I provided this advisory group member with a draft of the survey ideas the day before our one-on-one call, which she commented on with great insight overnight. On our call, I used computer screen sharing technology, made available through the ReadyTalk conference center, so that I could edit the draft while we were on the phone together, and she could witness the changes as I made them. She helped me to think through approximately two-thirds of the entire survey, and I really appreciated having and applying her individual experience, expertise, and insight. Further, it is clear she enjoyed participating in my action research project in this private and unique way. The action of making herself available in this way reinforces her continued support of my project, her commitment to it, and her excitement in helping to create the survey instrument.

The final survey contained 25-questions, and it was distributed to ETL alumni on October 14, 2013. Earlier that day, I piloted the final draft with two volunteers from my advisory group. They helped me to ensure clarity of the survey questions (and their accompanying answer options), as well as full functionality of the Survey Monkey instrument. While I have created and administered surveys before, I have never used the Survey Monkey tool, so I appreciated the

opportunity for two trial runs. I was always impressed by advisory group members' willingness to offer assistance and insight.

After adjustments to the survey were made based on the pilot testers' comments, and permission was granted by professors Coleen O'Connell and Lily Fessenden, I posted the Survey Monkey link to the "Ecological Teaching and Learning Master's Program" Facebook page. This group has a total of 205 members, and I can see that the survey link was accessed by 42 people from that page. This does not, however, mean that everyone that clicked on the link took the survey. To insure the survey also reached the email inboxes of ETL alumni, I asked Lesley University Professor, Coleen O'Connell, to share a list of emails for past ETL graduates. She kindly obliged. As a result, I also emailed the survey link to this list of 130 individuals, which yielded approximately 115 successful deliveries (after several bounce-backs from invalid email accounts). I am sure there is some overlap between Coleen's email list and the Facebook group members, but I decided that was okay. I was willing to risk some folks seeing it twice so that others could see it once. Plus I know reminders are helpful, and some folks prefer email to Facebook and vice versa. I wanted to provide multiple opportunities for ETL alumni to engage.

The ETL alumni survey remained open for two weeks, October 14 – 28, 2013. In that time period, it was completed by 58 individuals. With the overlap in the intended audience, I would estimate this number of respondents to represent a 35-40% response rate. I am confident the response rate was so high because these ETL graduates remember what it was like to design and execute an action research project, and they were happy to do all they could to help! Since I was so pleased with the survey response after only two weeks, I did not distribute additional reminders or keep the survey open longer than originally planned.

The following fifteen pages contain detailed analysis and interpretation of the survey results and organize this information by topic area. To review the introductory letter to participants, as well as the format of the 25 questions that comprised the final survey, see Appendix G. It is also noteworthy that of the 58 people who took the survey, 93% (or 54 individuals) fully completed all questions.

Introduction

Occupation: Of the participants, 33% (19) identified themselves as K-8 classroom teachers, 22% (13) as non-formal educators, 22% (13) as high school teachers, 5% (3) as preschool educators, 5% (3) as college level instructors, 3% (2) as education consultants, and 2% (1) as resource managers. The remaining 8% of respondents (4) described themselves as slightly removed from the education field, noting they are either stay-at-home parents, in-between jobs, or no longer in the field of education.

These data closely mimic PLT's most popular audiences. About a third of PLT users (33%) identify themselves as K-8 classroom teachers and an almost equal number (28%) describe themselves as non-formal educators (Comnes, 2013). This overlap presents substantial opportunity for ETL pedagogies and PLT practices to be applied to these two primary audiences.

Location: Of the 50 United States of America, a total of 19 states were represented in the survey. The top states for respondents included: Massachusetts, with 17 responses (30%); Maine, with 7 responses (12%); California, with 6 responses (11%); Colorado, with 4 responses (7%), Georgia, with 3 responses (5%), Vermont, with 3 responses (5%); New Hampshire, New Jersey, New York, Ohio, Pennsylvania, Virginia, each with 2 responses (3% each). One respondent (2% each) also represented the following 7 states: North Carolina, Alaska, Connecticut, Hawaii, Maryland, Tennessee, and Utah.

My eight-year employment as Manager of Education Programs for PLT has allowed me to become familiar with the implementation of its programs on the ground. PLT functions due in large part to a volunteer network of state leaders. These leaders, and their corresponding state-level PLT programs, each have different strengths, weaknesses, and capacities. This results in some PLT state programs being stronger than others. Looking at the top four states from the ETL alumni survey, these states also prove to be strong in their PLT capacities. This leads me to believe there is opportunity to connect specific PLT and ETL individuals in these locales to begin implementing the recommendations generated by this project.

Approximately 40% of the 58 respondents (23) described their work setting as suburban, and an equal number described it as rural (14; 24%) or urban (14; 24%). About a tenth of respondents (7; 12%) categorized themselves as working in a natural area. To compare this dataset with PLT populations, approximately one third of PLT educators describe their work setting as suburban, one third as rural, and one quarter as urban (Comnes, 2013). These data suggest the most common setting to apply ETL and PLT teaching techniques is suburban areas.

Supplemental Materials: When asked to rate their frequency with using supplemental environmental education materials, overall the most frequent response was "Not at All" for the six resources offered: Project Learning Tree, Project WET, and Project WILD, The GLOBE Program, The Leopold Education Project, and FOSS Kits. Only two supplemental materials were rated as used "Extremely Often" by one respondent each: Project WILD (2%) and Project Learning Tree (2%). An "Other" box allowed 10 respondents (6%) to list additional resources used.

I was initially surprised that ETL alumni have a tendency not to rely on external supplemental resources to build their curriculum. I lamented not asking follow-up questions that

could allow me to better understand this information, such as "why not?" and "what might make you consider their use?" The data does suggest, however, that whenever ETL alumni do use supplemental resources, they use them extensively, either "very often" or "extremely often." After further reflection, however, this anomaly became clear. I surmise that after graduating from Lesley's Ecological Teaching and Learning program, educators feel empowered to design and create their own curricula and teaching units, without relying on the help of supplemental materials. If ETL principles are one day integrated into PLT's educational materials and professional development, it will make the PLT program much more attractive to the ETL audience.

Standards: When asked to rate their familiarity with six specific education standards and teaching strategies, the most frequent response was tied between "Not at All familiar" and "Somewhat Familiar" for five of them: 21st Century Skills (33% of respondents); Common Core—English Language Arts (32%); Digital Learning (32%); Common Core—Math (31%); and Next Generation Science Standards (26%). The most frequent response was "Very Familiar" for the remaining teaching strategy, STEM (Science, Technology, Engineering, and Math) at 37%.

When asked to rank how important it is for their work that programs like PLT align with the same six education standards and teaching strategies, the most frequent response was "very important." Overall, the percentage of respondents ranking the alignment of different standards as very important was 35% for 21st Century Skills, 31% for Next Generation Science Standards, 30% for Common Core—English Language Arts, 28% for STEM, 27% for Digital Learning, and 26% for Common Core—Math.

These data suggest that even though ETL alumni are not extremely familiar with these education standards and trends, notions of their significance is apparent. This is suggested by the fact that most survey respondents feel it is "very important" for supplemental educational material to align with these trends. This knowledge gap presents opportunity for PLT to offer professional development in these content areas. To further support the goals of this action research project, it would be beneficial to investigate how these education standards and trends can relate to or otherwise support the key ETL pedagogies for Project Learning Tree. This type of investigation, however, lies outside the boundaries of this project.

Current ETL Practice

ETL Incorporation: When asked if they have successfully incorporated ETL in their teaching practice, 75% of respondents said yes, 25% of respondents replied "Somewhat," and zero respondents replied "No." Approximately 50% of respondents (30) offered to explain their response using a short-answer statement. These responses have been paraphrased for consistency and include[1]: "I have increased the time I spend teaching outdoors" (4 responses, or 7% of respondents); "I have increased my teaching of systems thinking" (4, or 7%); "The expectations of conventional schools limit my opportunity to incorporate ETL" (4, or 7%); "I now use ETL as a framework for my teaching" (4, or 7%); "I have increased my teaching of education for sustainability" (2, or 4%); "I have increased my teaching of community connections" (2, or 4%); "I have increased my teaching of place-based education" (2, or 4%); "I now more often reflect on my teaching practice" (2, or 4%); "I take opportunities to educate my colleagues on ETL principles" (2, or 4%); and "ETL has moved beyond my teaching practice; it permeates my life" (2, or 4%).

[1] Please note these comments have been paraphrased for consistency and coding. This question was presented in short-answer format, and no responses were provided.

The short-answer comments that support this question offer additional detail into how survey respondents practice ETL. The data suggest that ETL alumni often direct their energies toward a single pedagogy (among the referenced include systems thinking, education for sustainability, and place-based education). This supports the idea of Project Learning Tree identifying a subset of key ETL pedagogies to showcase in its teaching activities and professional development. Further, the pedagogies selected as often used by ETL alumni have overlap with those identified by this project's advisory group as holding promise for PLT.

Time Outdoors: As far as time currently spent teaching outside, 34% of respondents (19) indicated they spend less than 10% of the time teaching outdoors, 33% of respondents (18) spend 10-40% outside, 18% of respondents (10) spend 40-60% outside, 13% of respondents (7) spend 60-90% outside, and only 2% of respondents (1) spend greater than 90% of their time teaching outdoors.

Comparing this dataset with the results acquired from the previous question, it is interesting that while multiple ETL alumni stated they have increased the time they spend teaching outdoors, a majority of them still spend less than 10% of their time teaching outdoors. I applied a filter to investigate the occupation of the 8 individuals who spend more than 60% of their instructional time outdoors. This exercise reveals that none of these respondents are traditional classroom teachers; they are nonformal (5), preschool (2), and no longer in the education field (1). I see this as an opportunity for Project Learning Tree. PLT offers many resources that can help take education outdoors, and over 50% of the activities in the *PreK-8 Environmental Education Activity Guide* can be conducted outside (Project Learning Tree, 2013). I believe the data support ETL alumni's excitement over potentially practicing new pedagogical approaches outdoors though PLT.

Pedagogies Employed: Respondents were asked to rank the 29 ETL pedagogies to identify those that they most frequently employ. Looking at the combined average data for the 55 respondents for this question, the top 10 most frequently used ETL pedagogies are (from most to least):

- Place-based Education
- Experiential Education
- Environmental Education
- Multiple Intelligences
- Project-based Learning
- Learning Community: Collaborative Learning
- Systems Theory
- Education for Sustainability
- Action & Inquiry-based Research
- Natural Science Education

Comparing this dataset with the top pedagogies identified by the PLT advisory group, one can see that the top seven pedagogies currently employed by ETL alumni are all within the top ten identified by the PLT advisory group (see Table 1). These pedagogies will be targeted in the final recommendations for this action research project.

Table 1

Overlapping Top Ten PLT and ETL Pedagogies

PLT Advisory Group Responses **PLT-correlated pedagogies**	**ETL Alumni Survey Responses** **Current pedagogy use**
1. Environmental Education	1. Place-based Education
2. Constructivist Learning	2. Experiential Education
3. Place-based Education	3. Environmental Education
4. Natural Science Education	4. Multiple Intelligences
5. Project-based Learning	5. Project-based Learning
6. Systems Theory	6. Learning Community
7. Service Learning	7. Systems Theory
8. Experiential Education	8. Education for Sustainability
9. Multiple Intelligences	9. Action & Inquiry-based Research
10. Learning Community	10. Natural Science Education

In attempt to further understand the data collected by this question, I used Survey Monkey tools to filter the dataset by occupation. The result allowed me to see which pedagogies were most often used by the varied occupations of ETL alumni. Table 2 on the following page depicts the top five pedagogies employed by each occupation. These data suggest that while some pedagogies are appropriate across all occupations (such as place-based education), other pedagogies are more appropriate for certain grade levels and/ or occupational settings. This information will be valuable as PLT moves forward with its strategic plan and works to create educational units that are organized by grade level. This chart shows the pedagogies that can be applied to specific grade level bands.

Table 2

Pedagogies by Occupation

K-8 Classroom Teachers	**Non-formal Educators**	**High School Teachers**	**Preschool Educators**	**College Level Instructors**
Place-based Education	Place-based Education	Environmental Education	Multiple Intelligences	Experiential Education
Experiential Education	Experiential Education	Education for Sustainability	Holistic Education	Action & Inquiry-based Research
Multiple Intelligences	Environmental Education	Place-based Education	Natural Science Education	Place-based Education
Project-based Learning	Systems Theory	Systems Theory	Place-based Education	Constructivist Learning
Learning Community: Collaborative Learning	Natural Science Education	Experiential Education	Action & Inquiry-based Research	Education for Sustainability

Note. This chart depicts the five most frequently employed pedagogies for each of the most common ETL alumni occupations. The most popular ETL alumni occupations are listed from left to right, and the pedagogies listed below them are organized from most to least employed.

Disciplines: When asked in which discipline areas ETL principles are applied, 91% of survey respondents (50) indicated "science," 39% (21) indicated "reading/ writing (English Language Arts)," 31% (17) indicated "social studies," 31% (17) indicated "arts," and 24% (13) indicated "math."[2] About 16% of respondents (9) described the discipline area as "Other" and wrote in a variety of responses, which included skill building, gardening, history, and all discipline areas.

This dataset is important to PLT, as I believe it also mimics the percentages that PLT activities are applied to specific subject areas. The ETL alumni survey data suggest that educators are more than twice as likely to apply ETL pedagogies to science content than any other discipline area. While I would like to believe that PLT's interdisciplinary activities are used in many subject areas, I am confident that teachers of science-based classes are more likely

[2] Respondents were permitted to select more than one discipline area, thus total percentages sum to over 100%.

to apply the environmental education resources that the PLT program offers. The data suggest that any PLT resources that support, promote, and expand upon ETL pedagogies should first and foremost be targeted towards science educators.

Resources: When asked to rate seven different teaching resources in terms of how often they are utilized, overall two resources were used "extremely often," and they were sensory items (rating average 3.6 out of a possible 5.0) and supplemental curricular materials (rating average 3.5). The next three teaching resources were used "very often" and include on-site outdoor experiences (3.4), manipulatives (3.4), and technology (3.1). The final three teaching resources were employed "rarely" and include off-site field trips (2.6) and guest speakers (2.5). Looking at just at K-8 classroom teachers yields a similar ranking of responses, but nonformal educators came up with greater variation: on-site outdoor experiences (3.8), sensory items (3.4), technology (3.0), off-site field trips (2.8), manipulatives (2.8), supplemental curricular materials (2.7), and guest speakers (2.4).

Manipulating the data in this way reveals that different types of teachers embrace different types of resources and therefore utilize them in varying amounts. It is interesting that when asked about supplemental materials in this context, survey respondents replied they are utilized "extremely often." However, when asked about supplemental materials early in this survey, respondents did not indicate that they used tested, accredited, and published supplemental resources. This leads me to wonder what types of supplemental resources are being used "extremely often," as they imply. Overall, these data suggest that any PLT resources infused with ETL principles should include educational resources that primarily utilize sensory items, outdoor experiences, manipulatives, and technology.

Support: In terms of who supports respondents in their ETL teaching practice, 67% (37)

of respondents report "other teachers/ teachers aides," 47% (26) of respondents report "administrators," 44% (24) of respondents report "resource professionals," 44% (24) of respondents report "community members," 35% (19) report a "professional learning community," 28% (15) report "classroom parents," 25% (14) report "volunteers," and 11% (6) report an "online forum.[3]" Respondents were also offered an "Other" box to describe additional supports, which ranged from supervisors, current and former students, and family members to no direct support.

These data point towards the importance of other trained educators when executing successful teaching strategies. While good examples of these empowering individuals include peer teachers, classroom aides, resource professionals, and/ or school administrators, the data suggest that peer teachers are the most valuable to enabling ETL teachers' practice. This finding holds significant implications for PLT professional development in terms of its ability to facilitate team teaching and build relationships among peers.

Administration: When asked about administrative support for their ETL practice, 32% of survey respondents (17) replied their administrative is "very supportive," 30% (16) replied "extremely supportive," 22% (12) reported "moderately supportive," 13% (7) replied "somewhat supportive," and 4% (2) reported "not at all supportive." Of the two respondents who reported their administration was "not at all supportive," one was a non-formal educator and one was a K-8 classroom teacher.

Taken together, the data indicate that nearly two thirds of all administrations are very supportive of ETL in practice. This receptiveness holds promise for the attractiveness of PLT educational materials and professional development that support and promote ETL philosophy.

[3] Respondents were permitted to select more than one support, thus total percentages sum to over 100%.

Professional Development: Approximately 70% of respondents (38) confirm they have some type of mandatory professional development commitments. About an equal number confirm that they either do not have professional development commitments (17%; 9) or they sometimes do (13%; 7). Of the total 54 respondents, 61% (33) reported they receive financial support to attend educator professional development opportunities. Of the remainder, 30% (16) indicated they "sometimes" receive support to participate in professional development offerings while 9% (5) reported no support at all.

These data suggest that not only are 70% of ETL alumni required to engage in professional development activities, but almost as many individuals also receive financial support to do so. This indicates there is both the need for PLT/ ETL professional development and the ability to pay for it. This fact will be important to Project Learning Tree, as part of the organization's strategic plan includes generating appropriate revenue to sustain its programs.

Initiatives of Interest: Forty-two survey participants (72%) shared additional information about broad-based initiatives that their place of employment is most concerned with at this point in time. Many of the comments overlapped, and they tended to focus on the following themes[4]: implementation of the Common Core State Standards (6 responses, or 10% of respondents), securing appropriate and reliable funding (6, or 10%), sustainability efforts (4, or 7%), increasing test scores (4, or 7%), achieving measurable conservation outcomes (3, or 5%), teacher evaluation (2, or 4%), securing accreditation for their school/ center (2, or 4%), raising cultural awareness (2, or 4%), increasing STEM initiatives (2, or 4%), focusing on social and emotional learning (2, or 4%), and investigating dropping enrollment rates (2, or 4%).

It is not surprising that the most common initiative is related to mandates set by national

[4] Please note these comments have been paraphrased for consistency and coding. This question was presented in short-answer format, and no responses were provided.

academic standards. What is surprising is that only 10% of the survey population articulates meeting academic standards as their primary concern. This suggests that perhaps ETL alumni choose to work in settings that are less focused on meeting academic standards and more attracted to settings that embrace teacher pedagogy over student content goals. A future inquiry would be to identify where the pedagogies of ETL and the teaching activities of PLT experience overlap with academic standards of interest, and specifically in this case, the Common Core State Standards.

Desired ETL Practice

Desired Time Outdoors: When asked how much time respondents *wished* they taught outdoors, 35% of respondents (19) want to spend 40-60% teaching outside, 32% (17) want to spend 60-90% outside, 18% (10) want to spend more than 90% outside, 13% (7) want to spend 10-40% outside, and 2% (1) want to spend less than 10% of their time teaching outdoors. About 31% of respondents (17) indicated that more planning time would best help them to spend more instruction time outdoors. Respondents also indicated that other outdoor education enablers include adult help (chaperones, assistants, teachers' aides, etc.) at 18% (10), lesson plans/ teaching activities and professional development at 16% (9), and success stories to learn from as well as better weather conditions at 9% (5). Approximately 50% of respondents (27 out of 55) offered to explain their response using a short-answer statement. Popular responses included[5] more instruction time (such as labs, double periods, etc.) (5 responses, or 9% of respondents); access to more/ better/ affordable transportation (5, or 9%); additional financial support (2, or 4%); more planning time (2, or 4%); more curriculum flexibility (2, or 4%); more support from school community (2, or 4%).

[5] Please note these comments have been paraphrased for consistency and coding. This question was presented in short-answer format, and no responses were provided.

The data suggest that it is ideal to spend approximately half of instructional time outdoors. This means there is adequate possibility for Project Learning Tree to support survey respondents in their desire to spend more educational time outside of the classroom. The fact that planning time is the primary enabler in allowing survey respondents to take students outdoors can be connected to planning opportunities offered by PLT professional development. At present, PLT workshops are focused on conducting student activities with teacher participants. These data suggest it might be more valuable to spend less time on specific PLT activities and more time on planning for their implementation.

Desired Pedagogies: Respondents were asked to rank the 29 ETL pedagogies to identify those that they desire to employ *more often*. Looking at the combined average data for the 55 respondents for this question, the top 10 most desired ETL pedagogies to employ more include (from most to least):

- Education for Sustainability
- Indigenous Education
- Project-based Learning
- Creative Arts in Learning
- Experiential Education
- Action & Inquiry-based Research
- Learning Community: Collaborative Learning
- Place-based Education
- Deep Ecology
- Service-Learning

When comparing this list to the overlapping PLT/ ETL pedagogies identified by the advisory group (see Figure 5, p. 30), seven of the pedagogies are found to overlap, with stronger PLT connections given to the first four: place-based education, project-based learning, experiential education, and service learning, then followed by education for sustainability, learning community: collaborative learning, and action and inquiry-based research. These pedagogies are rising to the top as target priorities for the PLT program, as not only do survey participants have expertise in these teaching techniques, but they also possess the desire to employ them in additional amounts.

In attempt to further understand the data associated with the pedagogies survey participants have desire to employ more often, I sorted this dataset by occupation for further analysis. Table 3 on the following page depicts the desired ETL pedagogies to employ more often by participant occupation (from most to least). These data compliment Table 2 (p. 54) in that while some pedagogies are desirable to implement across all occupations (such as education for sustainability), other pedagogies are more desirable for certain grade levels and/ or occupational settings. This information will prove valuable as PLT moves forward with its strategic plan and works to create educational units that are organized by grade level. This chart depicts the pedagogies that educators wish to apply as they relate to specific grade level bands.

Table 3

Desired Pedagogies by Occupation

K-8 Classroom Teachers	**Non-formal Educators**	**High School Teachers**	**Preschool Educators**	**College Level Instructors**
Education for Sustainability	Learning Community: Collaborative Learning	Deep Ecology	Systems Theory	Action & Inquiry-based Research
Place-based Education	Education for Sustainability	Experiential Education	Education for Sustainability	Deep Ecology
Action & Inquiry-based Research	Holistic Education	Creative Arts in Learning	Indigenous Education	Adult & Popular Education
Creative Arts in Learning	Humane Education	Education for Sustainability	Intercultural Education	Creative Arts in Learning
Experiential Education	Systems Theory	Environmental Education	Outdoor Adventure Education	Education for Sustainability

Note. This chart depicts the top five pedagogies that survey participants desire to employ more often for each of the most common ETL alumni occupations. The most popular ETL alumni occupations are listed from left to right, and the pedagogies listed below them are organized from most to least desire to employ.

Desired Capital: When asked what single capital resource would *most benefit* them in more fully implementing ETL, 36% of respondents (20) indicated that financial resources (grants, monetary incentives/ support) would be most helpful. The next popular response was social/ cultural resources (community participation, diverse perspectives), with a response rate of 26% (14). The third most popular response was human resources (teachers aides, volunteer support), at 18% (10). The bottom two responses were intellectual resources (knowledge, skills, know-how) and material resources (hands-on tools, supplies, manipulatives), both coming in right around 10% (or 6 respondents each). About 22% of respondents (12) described the most necessary resource as "Other" and wrote in a variety of responses, which include:

- More time to develop and implement (7)
- More supportive leadership / administration (2)
- A change in supported curriculum (2)

- Educator professional development (1)

These data show that while many different forms of capital are required to successfully implement ETL, it is financial resources that are the most essential. This means that items such as implementation grants and teacher stipends are invaluable to educators in their work to increase ETL in practice. I am confident that PLT can provide these resources for survey participants. We could raise funds to pilot test professional development focusing on ETL and offer teacher stipends to participate and assist in evaluating these new PLT programs. It is also possible to work with Project Learning Tree's development staff to fundraise for classroom grants to assist teachers in implementing ETL in practice through PLT.

Desired Professional Development: Survey respondents were asked about what professional development program design elements would *most benefit* a program focused on Ecological Teaching and Learning. Over half of the survey respondents, specifically 56% (or 31 respondents), indicated the professional development program (PDP) should create a collaborative, reflective learning community. Approximately 42% (23) indicated the PDP should offer individual and active learning opportunities, 22% (12) indicated the PDP should be long-term, sustained, and intensive, 16% (9) indicated the PDP should be supported by online tools and technology, 14% (8) indicated the PDP should clearly define and prioritize outcomes, and 9% (5) indicated the PDP should adhere with set standards and policies.[6]

Research specifically conducted for Project Learning Tree by PEER Associates was responsible for generating the multiple choice options to this question (see Appendix G). PEER Associates specializes in evaluating existing programs in order to provide strategic direction for new program development (PEER Associates, n.d.). Data from the ETL alumni survey point to

[6] Respondents were permitted to select more than one professional development program design element, thus total percentages sum to over 100%.

the primary professional development benefit for this audience: creating a collaborative, reflective learning community. This means all PLT professional development that focuses on ETL principles should be focused on this central concept.

ETL Impediments: When asked about their biggest impediments to implementing ETL, 67% of respondents (37) indicated that time (or lack of) was their largest impediment; 27% (15) indicated money (or lack of), 27% indicated the importance of teaching to the test, 20% (11) indicated administrative support (or lack of), 16% (9) indicated educator skills, knowledge, experience, 14% (8) indicated classroom assistance (or lack of), and 7% (4) indicated the "doom and gloom" nature of issues/ topic areas[7]. About 20% of respondents (11) described the largest ETL impediment as "Other" and wrote in a variety of responses. These responses range from a restrictive curriculum to course goals to not applicable (no experienced impediments).

Desired Conditions: Forty-six survey participants (79%) shared additional information about what they might do to support and sustain ETL in practice. Many of the comments overlapped, and they tended to focus on the following themes[8]: facilitate more teaching and learning outdoors (10 responses, or 17% of respondents); engage in professional learning communities (6, or 10%); have all educators graduate from Lesley's ETL program (5, or 9%); change current class schedule and structure (4, or 7%); embrace a paradigm shift in the foundation of teaching and learning (4, or 7%); more time (to teach, plan, learn, explore) (3, or 5%); reject/ eliminate focus on standards and testing (3, or 5%); create grade-level specific thematic units (3, or 5%), integrate ETL concepts into Common Core State Standards (2, or 4%), and create more reflective practitioners (2, or 4%).

[7] Respondents were permitted to select more than one ETL impediment, thus total percentages sum to over 100%.
[8] Please note these comments have been paraphrased for consistency and coding. This question was presented in short-answer format, and no responses were provided.

The top two responses for this category support findings confirmed earlier, by previous survey questions. This offers my project much validity. These conclusions reinforce the need for PLT educational materials and professional development that both takes education outdoors and engages educators in professional learning communities. Efforts to change PLT's program materials and workshop format should be targeted in these two content areas.

Desired Follow-Up: Two-thirds of survey respondents (39 individuals) indicated that they are interested in receiving the results from this survey. They provided their email address so that I could send them a copy of the final analysis, which is absent of the findings and conclusions offered in this report. Each of these individuals received a copy of the summative narrative, as well as a thank you letter for their participation, in December of 2013.

An almost equal number of respondents (34 or 58%) offered to make themselves available by telephone for any additional questioning necessary to clarify data collected by this survey. These individuals provided their names and telephone numbers so that this conversation might continue. Many survey respondents also used this short-answer space to offer additional suggestions, resources, and feedback. In the end, however, I did not find it necessary to conduct any follow-up interviews with these volunteers.

A third complete action research cycle is reflected within these experiences. Again following the flow chart in Figure 3 (p. 25), I studied and planned to prepare the ETL alumni survey, took action by distributing it, collected and analyzed the associated datasets, and reflected on the experience. The results of this third cycle serve to influence the fourth and final action research cycle, which centers on the third conference call and attempts to make meaning out of the collective experiences associated with the first three cycles.

Fourth Cycle - Conference Call 3

This project's third and final conference call was hosted on Thursday, November 14, 2013. On this call, the advisory group helped me to infer meaning from the survey analysis, revisit the project's overarching researching questions, and create action items for the project's next steps in light of how these results might affect Project Learning Tree's educational materials and professional development.

Once again, I used a Doodle Poll to confirm the selected date, I created and distributed an agenda in advance, and I requested that all participants take and submit notes. The agenda for this call was centered on the following question: What meaning can the action researcher and her advisory group draw from this information, specifically in relation to the original research questions (which first appear on p. 7-8 of this report). My hope was that through reviewing the analysis from the advisory group's second conference call and the ETL alumni survey would generate tangible action items that correspond to the project's original research questions.

Six out of eight advisory group members participated in the final conference call. While each participant did submit notes, one individual's was received too late to be included in the final analysis. After reading and rereading the participant notes, I organized the comments into common themes. After ample review of these data, I noticed that the advisory group notes, and thus the conversation that support them, had grown from exploratory to concrete. Few, if any, emotions were expressed and most ideas presented were new. As such, my common trend of coding the conference call notes for common themes, emotions, and new ideas required a new approach for analysis of the final call. Instead, I chose to organize the data generated, was mostly sets of new implementation ideas, by thematic area.

All twenty of the ideas presented were delineated into five major themes. They include ideas related to PLT professional development [6 ideas], incorporating ETL pedagogies into PLT programs [5 ideas], ETL alumni survey [3 ideas], academic standards [2 ideas], and marketing PLT [2 ideas]. Finally, two additional ideas were collected that do not fit into any of these categories, yet their content bears merit for inclusion in this final report.

Digging deeper into the ideas generated on PLT professional development, the majority of comments made in this topic area (45% or 5 of 11 comments) were related to the importance of educators' peer-to-peer learning. Since teachers can relate to each others' successes and challenges, these data suggest that learning communities allow teachers to work together to create, share, and implement new ideas. This will be essential for PLT not only to help convey ETL concepts in its professional development, but also build learning communities to ensure this knowledge is sustained and implemented over time. Other comments in this area relate to offering a series of PLT workshops to roll out ETL concepts over time [19%], connecting professional development opportunities with teachers' in-service requirements [9%], offering PLT professional development that focuses on a particular pedagogy (i.e. sustainability or place-based education) [9%], consider natural resource professionals (in addition to teachers) when designing PLT/ ETL professional development [9%], and continue to maintain the advisory group created by this project to review, test, and revise these PLT program changes over time [9%].

When analyzing the comments related to the idea of incorporating ETL pedagogies into PLT programs, one solution rose to the top. This idea was supported by 72% (or 5 of 7) of the comments in this category. This solution is centered upon the development of a tool that would be used to explain and identify ETL pedagogies as they occur throughout PLT's *PreK-8*

Environmental Education Activity Guide. This tool is further detailed in the Conclusions section of this report. Only two other comments were made in reference to the idea of implementing ETL pedagogies into PLT programs. They included debate over which pedagogies to address in PLT materials (those that are currently used or those that are desirable to employ?) [14%], as well as a suggestion to organize ETL pedagogies by the type of educators that are more prone to use them (early childhood, K-8, high school, etc.) [14%].

As for the analysis of the ideas generated by the ETL alumni survey on the final conference call, much of the information served as a review of findings previously discussed. Sixty percent of the comments [6 of 10] for this idea area were related to the currently employed ETL pedagogies that were identified by advisory group as exhibiting much overlap with PLT. The other comments in this section explored why survey participants do not seem to use supplemental educational materials [30%], and speculated at how the impediments of time and money might be further defined as impediments to ETL implementation [10%].

The comments under the ideas related to academic standards specifically referenced two sets of standards: the Common Core State Standards and the Next Generation Science Standards. Only four comments combine to support the overarching idea of academic standards. This suggests that academic standards are not as important to the advisory group as the previous two ideas previously discussed. Comments in the academic standards category speculated whether these standards might be too new for teachers to understand and execute [50%] and the creation of themed PLT units that focus on meeting these specific academic standards [50%].

The final organizing idea relates to comments made on marketing Project Learning Tree programs. Only two comments were made to support this idea, so I will represent them in bullet form:

- Since Environmental Education appears as a low-ranking pedagogy in terms of its current use, perhaps marketing PLT as an environmental education program is limiting and therefore not an effective marketing strategy.
- Branding PLT as an ETL resource could serve to help PLT's marketing efforts.

These comments are important because they serve as a reminder that incorporating ETL principles and pedagogies into PLT materials may help PLT to become more attractive not only to survey participants, but to educators across the United States. An ETL-infused Project Learning Tree has the potential to appeal to many formal and informal education professionals across many different grade levels and occupational settings. The opposite relationship holds similar value as well; an ETL-infused PLT would provide more exposure to the ETL program, which could develop more ETL program alumni in return.

I was unable to successfully categorize the final two comments generated from the final conference call, but I wanted to ensure their inclusion in this final report. One comment is related to executing the conclusions of this research project beyond the timeline dictated by this project and the second relates specifically to the power of technology as a tool to enable the confluence of PLT programs and ETL principles. To continue the scope of work outlined created by this action research project, it was suggested that a logic model be developed to articulate the desired outcomes of a new PLT program infused with ETL principles, practices, and pedagogies. This logic model might identify the goals of PLT and ETL, outcomes for new PLT professional development strategies, and identifies benchmarks for data collection, revisions, and further development. The final comment related to technology looks to computer information systems to help users sort PLT educational materials by ETL pedagogy. While both of these comments

contain noteworthy ideas, I am uncertain of PLT's financial, technological, and human resource capacity to execute either one.

After synthesizing the data from the final call and drawing findings from it, I find that the advisory group's conversations have grown from exploratory to concrete in nature. This observation is supported by the fact that many new ideas were presented and explored in this final analysis. It is evident that advisory group members are more than engaged in this conversation, they have become committed to this work. This commitment holds much meaning, as it is the driving force that will encourage this work to continue after this final report is complete.

My final action research cycle is reflected within the experiences associated with the third conference call. Again following the flow chart of Figure 3 (p. 25), I studied and planned to prepare for the second conference call, took action by facilitating it, collected and analyzed the associated datasets, and reflected on the experience. The results of this final cycle serve to influence the conclusions drawn from all data analysis via final recommendations for PLT's educational materials and professional development.

Data Collection Methods - Secondary

While it is clear that I have engaged a focus group and a questionnaire as the two primary methods of collecting data for this research project, I also employed two other data collection techniques. In Schmuck's (2006) explanation of proactive and responsive action research, his discussion explores ways to "check what the data mean" (p. 71). I decided to use informal interview check-ins with my supervisor, Al Stenstrup, PLT's Director of Education Programs. These informal check-ins provided opportunities to review the "5 Ws and H," of this action

research project - the who, what, when, where, why, and how – as well as to help inform the direction of my research (Mills, 2011, p. 79).

Throughout this action research project and data collection efforts, I also kept a professional journal to collect data, organize ideas, and reflect on practice. Alber (2011) writes, "Many students report that taking a few minutes at the end of the day to record their thoughts was helpful as they implemented their studies" (p. 70). It is easy to think that I will remember the details of specific conversations as they are experienced, but keeping a journal ensured my ability to keep track of daily tasks and conversations that took place over the course of my research. In addition to keeping this information better organized, tracked, and documented for later reference, keeping a professional journal allowed me to build in reflection on the data collected. In reviewing my professional journal, it is clear I have primarily used this tool for two things 1) reflection on new literature resources to support this research and 2) reflection on the regularly scheduled meetings with my supervisor. Reviewing literature resources continued to inform my action research throughout its entire duration, as well as offer points of discussion for the advisory group's conference calls.

To strengthen the results of this research, I designed a method to triangulate the data collected for each of this project's four sub-questions. All conclusions reached are substantiated by using different data sources to achieve the same results. Table 4 on the following page depicts the data collection triangulation matrix method employed.

Table 4

Data Collection Triangulation Matrix

Research Sub-Questions	**Data Source**		
	1	**2**	**3**
1. Where do the pedagogies of PLT and ETL intersect?	Advisory Group	Survey	Professional Journal
2. How can an advisory group contribute to the effort to bring together the goals of PLT and ETL?	Advisory Group	Check-ins with Supervisor (Informal Interviews)	Professional Journal
3. What kind of professional development would help educators meet student learning goals while also training teachers to support ETL pedagogies?	Survey	Professional Journal	Check-ins with Supervisor (Informal Interviews)
4. How can a focus on ETL improve PLT's ability to support teachers in meeting academic standards and STEM objectives?	Survey	Professional Journal	Check-ins with Supervisor (Informal Interviews)

Conclusions

The ultimate goal of this action research project was to identify potential ways in which Project Learning Tree can help support, develop, and cultivate more Ecological Teachers and Learners using the design and delivery of its most popular resource, the *PreK-8 Environmental Education Activity Guide.* I have organized my major findings into two sets of recommendations. Recommendations are offered for PLT's *PreK-8 Environmental Education Activity Guide* and PLT's professional development offerings. I will first provide a bulleted overview, and then elaborate on a more detailed description of the final conclusions.

- Recommendations for PLT's *PreK-8 Environmental Education Activity Guide*
    - Select five ETL pedagogies to highlight throughout the guide,[9] and expand upon the them in the following ways:
        - Language in the guide's introduction (define terms, overlapping pedagogies, and create accompanying visual).
        - Employ user-friendly icons to illustrate where these pedagogies can be found within traditional PLT activities.
        - Support the first two changes above with detailed descriptions and additional information on the five selected pedagogies in a new appendix.
    - Create PLT units (a comprehensive set of PLT activities)
        - Create units for each of the five selected pedagogies.
        - Create units that support specific academic standards (Common Core State Standards and Next Generation Science Standards).
- Recommendations for PLT's professional development
    - Create professional development offerings focused on the five selected pedagogies.
        - Trainings should focus on the new, pedagogy-based introduction and appendix, as well as highlight PLT activities that employ those techniques.
    - Focus professional development on creating professional learning communities and peer-to-peer support systems.
        - Target professional development opportunities on teacher in-service days.

[9] I have recommended the appropriate five pedagogies based on this research.

- Create a strategy to sustain contact with professional development participants over time (online forums, peer-to-peer check-ins, and follow-up workshops should be given priority).

Recommended Pedagogies for PLT

This research offered insight into the five ETL pedagogies that Project Learning Tree should incorporate into its educational materials and professional development. This project's first action research cycle uncovered the ETL pedagogies that the advisory group identified had significant overlap with PLT programs (see Figure 5, p. 30). This dataset allowed the calculation of a total percent of each of the top ten pedagogies' overlap with PLT (see Table 5). These percents can be considered the ETL pedagogies' approval rating for relatedness to PLT.

Table 5

Advisory Group Approval Ratings for PLT-Correlated Pedagogies

Pedagogy	**Approval Rating**
Environmental Education	88%
Constructivist Learning	63%
Place-based Education	63%
Natural Science Education	50%
Project-based Learning	38%
Systems Theory	38%
Service Learning	25%
Experiential Education	25%
Multiple Intelligences	25%
Collaborative Learning	13%

Similar percentages were then calculated with datasets obtained from the ETL alumni survey. Statistics from the survey yielded approval rating percentages for ETL pedagogies currently used (Table 6) and ETL pedagogies that were considered desirable to more often employ (Table 7).

Tables 6

ETL Alumni Survey Approval Rating for Current Pedagogy Use

Pedagogy	Approval Rating
Place-based Education	71%
Experiential Education	53%
Environmental Education	40%
Multiple Intelligences	38%
Project-based Learning	38%
Learning Community: Collaborative Learning	35%
Systems Theory	33%
Education for Sustainability	31%
Action & Inquiry-based Research	24%
Natural Science Education	24%

Table 7

ETL Alumni Survey Approval Rating for Desired Pedagogy Use

Pedagogy	Approval Rating
Education for Sustainability	31%
Project-based Learning	22%
Indigenous Education	22%
Creative Arts in Learning	20%
Experiential Education	18%
Place-based Education	16%
Learning Community: Collaborative Learning	16%
Action & Inquiry-based Research	16%
Service Learning	15%
Systems Theory	13%

A summation of the percentages of pedagogies identified as most often employed (Table 6) and the pedagogies identified as most desirable to employ (Table 7) yields a listing of the most popular pedagogies by percent. I summed these percentages to have PLT materials not only meet the current needs of ETL educators, but also assist future efforts to implement ETL practices and pedagogies. Summing these percentages offers PLT guidance in supporting what these educators are already doing, while also offering them additional resources to expand and strengthen their practice. The bulleted list below depicts the five recommended pedagogies in the following format: recommended pedagogy (current % + desired % = recommended %).

- Place-based Education (71% + 16% = **87%**)
- Experiential Education (53% + 18% = **71%**)
- Education for Sustainability (31% + 31% = **62%**)
- Project-based Learning (38% + 22% = **60%**)
- Systems Theory (33% + 15% = **48%**)

When summing the percentages for current and desired pedagogies, only two other pedagogies ranked slightly higher than systems theory in terms of their approval rating: Environmental Education (40% + 11% = **51%**) and Learning Community: Collaborative Learning (35% + 16% = **51%**). Since Project Learning Tree materials already adequately describe environmental education, and organize educational activities around this overarching pedagogy, I eliminated it from the list of possibilities. Environmental education is abundantly apparent in PLT's educational materials and professional development and as such can be removed from the recommendations of additional pedagogies for future inclusion. Support for the final pedagogy, Learning Community: Collaborative Learning, is addressed in the recommendations for PLT's professional development offerings.

Recommendations for PLT's PreK-8 Environmental Education Activity Guide

Now that the five target pedagogies for the PLT program have been articulated, this report will make further recommendations as to how to highlight them throughout PLT's most popular resource, the *PreK-8 Environmental Education Activity Guide.*

Much of PLT's traditional educator audience will be unfamiliar with Ecological Teaching and Learning's philosophy and approach. Before educators can endorse the ETL approach they have to understand it, so a critical first step is to provide an overview of the ETL approach in the guide's introductory materials. This type of initial stage-setting is essential form a solid foundation for deeper pedagogical understanding and engagement. While this supporting information could also be housed on a website or as a separate document, it seems most logical to have them as part of the introductory materials already found in the PreK-8 guide. As an integrated part of the resource, they can be quickly and easily accessed by educators. I

recommend this introductory pedagogical piece to also include an aesthetically pleasing and inspiring visual that shows the intersection of ETL and PLT to illustrate the natural crossover.

To carry the philosophy outlined by PLT's new pedagogical approach throughout the *PreK-8 Environmental Education Activity Guide*, I recommend using some type of signifying icon. This icon would appear in the guide each type a particular pedagogy was employed. PLT's educational materials already use an icon-based approach to highlight places where differentiated instruction might be employed and different technology tools might be used to enhance each lesson. I envision applying this idea to the five pedagogies selected for PLT.

The PLT icons for differentiated instruction and technology are supported by additional information contained in an appendix. I would recommend the same structure to support the new pedagogy icon. A new appendix should describe each of the five selected pedagogies in detail, as well as describe their appropriate application to PLT materials.

The current *PreK-8 Environmental Education Activity Guide* contains nearly one hundred individual activities. These activities can be completed individually or combined in scope and sequence to create units or otherwise study topics of interest in great depth. My final recommendation for the *PreK-8 Environmental Education Activity Guide* is the creation of PLT units. These comprehensive sets of PLT activities can be built around many different areas of interest. Data from this project suggests that one unit could be created for each of the five selected pedagogies. These pedagogical units would allow teachers to employ a single pedagogy quite intensively in their practice.

A final idea for PLT units is related to national academic standards. While this project did not collect as much detail in this content area, the data points to the importance of two current

standards: the Common Core State Standards and the Next Generation Science Standards. I recommend that PLT also create units that address mandated content by these sets of standards.

Recommendations for PLT's Professional Development

To support and expand upon the recommendations made for PLT's *PreK-8 Environmental Education Activity Guide*, professional development offerings focused on the five selected pedagogies should be designed and executed across the United States. These PLT workshops should focus on the new, pedagogy-based introduction and appendix, as well as highlight PLT activities that employ those techniques. While selected PLT activities that employ the selected pedagogies can be modeled, a majority of time in the professional development setting should be devoted to planning for implementation of these new PLT resources and pedagogical techniques.

Further, these PLT professional development opportunities should focus on creating professional learning communities and peer-to-peer support systems between and among participants. This can be executed in a number of ways, as there are multiple strategies to sustain contact with professional development participants over time. These strategies that should be given priority include the use of online forums, peer-to-peer check-ins, and follow-up workshops.

PLT professional development opportunities should also coincide with teacher in-service days and target school districts, education centers, or others teams of teachers that work together in the same physical locale. This recommendation is supported by the data that shows time and money are two of the largest impediments to attending and implementing successful professional development. It will also help to support and sustain the learning communities the data reveals as so essential.

A final recommendation that derives from the final advisory group conference call indicates the importance of modeling new teaching techniques with students. PLT workshops are currently designed for educators only. The data from this research suggests that modeling activities with students in classrooms (instead of educators in workshops) is a good way to showcase the effectiveness of new teaching techniques. Directly applying new PLT resources and ETL pedagogies with the students who are intended to benefit from them not only help teachers learn, but also simultaneously address the team building and peer-to-peer support the data suggest is essential.

A final conclusion that derives from coding for emotions confirms that the work associated with these PLT recommendations should continue into the future. The data reveal that the co-researchers remain invested in the inquiry outlined by this project. Collectively, the top two most often portrayed emotions on the conference calls are positive (40% of the time) and thoughtful/ reflective (20% of the time). These data confirm that not only do co-researchers wish to explore this inquiry in more depth (indicated by thoughtful/reflective comments), but they will also experience excitement and pleasure from this work (indicated by positive comments).

Presentation of Results

This project's findings will be presented in several ways. Aside from this final written report, three oral presentations have been confirmed to communicate the results reached. The first oral report will take place within the first two weeks of January, 2014. In this presentation, I will relay the recommendations articulated in this report to Project Learning Tree's national staff members. This presentation will take place in one of their weekly team meetings at the Project Learning Tree national office in Washington, DC. This presentation will offer me the opportunity to discuss the recommendations found within this report with the decision-makers

capable of implementing such change. In addition to discussing the merit of this report's recommendations, national PLT staff members will also discuss their integration into the 2014 workplan for the organization. Finally, this staff presentation is important because it will serve as a trial run to the second presentation, which is scheduled to take place at Lesley University on January 18, 2014. This second presentation is the final requirement for the completion of the Ecological Teaching and Learning Master of Science Degree.

The third scheduled oral presentation will take place in May of 2014 at the annual Project Learning Tree conference in Traverse City, Michigan. At this event, I will host a one-hour conference session that reviews this action research process and its actionable results. It is my hope that the actionable results will undergo more cycles of action research in the future, resulting in some type of product or model that becomes integrated into PLT's new pre-k – 8 curriculum design and delivery (anticipated completion 2016).

Finally, this written report will be used as the foundation for an article that will be published in Project Learning Tree's electronic newsletter, *The Branch. The Branch* is distributed quarterly to 20,000 educators across the country who have enrolled in PLT professional development workshops. This newsletter article will be promoted using PLT's social media communication tools, including Facebook, blog, and international listserv.

Ethics, Bias, and Validity

As teacher-researchers move through action research issues and choice points, they move beyond accomplishing tasks to asking "questions about *the value of* the very things [they] are seeking to accomplish" (emphasis mine, Reason & Bradbury, 2006, p. 448). This ethical thought exercise illuminates the multiple and varied reasons that drive this action research project. I

experienced some ethical concern over balancing my need to revise PLT's pre-k–8 curriculum and accompanying professional development and my desire to cultivate more ecological teachers and learners on this planet. The involvement of both PLT stakeholders and ETL alumni in this project helped to balance this interplay.

The questionnaire distributed to ETL alumni required participant permission. The Survey Monkey link to complete the questionnaire first directed participants to a brief introductory letter. This letter introduced my role as teacher-researcher and reviewed the action research project plan, a description of the survey questions, and details on how the data will be used (see Appendix G). After reviewing this information, participants were asked to offer their consent by advancing the survey. Clicking on this second link confirmed their participation in the study and awarded me permission to analyze the data submitted.

In developing an advisory group to work through some of the questions and ideas related to integrating PLT and ETL, I did my best to remain cognizant of how my knowledge and ideas can affect this group's work. I found myself amid the challenge Grant articulates so well; the "struggle to 'stop, look and listen'" (2007, p. 271) to the project as it unfolds. While I had my own ideas about the integration of PLT and ETL, I tried my best to allow advisory group members to lead the discussion. I captured my own thoughts separately, using my personal reflective journal along the way. The advisory group's engagement in the creation of the ETL alumni survey also helped to decrease bias from my perspective.

In selecting advisory group participants, I made strategic choices in order to have diverse audiences represented. Upon reviewing my proposed advisory group, it was clear that gender was not balanced, as only 25% of the invitees were men. While this percent is representative of

the field of environmental education, I chose to expand the advisory group invitation to include a few more men. The confirmed eight advisory group participants showcase gender, geographic, cultural, and economic diversity.

As part of the data collection strategy for the conference calls, I requested each participant to take notes. In my task of reviewing and coding these documents, I found that many new ideas were revealed that were not articulated openly on the conference calls. To think that these ideas would have been lost if participants did not submit their notes is tragic! The addition of participant note-taking to verbal participation allowed more data to emerge, thus offering this project increased validity.

Overall I was surprised, overwhelmed, and humbled, by the advisory group members' excitement over this project. They all believe this research will both interest and benefit others in the field of environmental education. Advisory group participants have many ideas on where I might publish these action research results and even present my findings at conferences and other events (see Appendix H). This support reminded me that I am conducting admirable action research and enabling positive change for the future. One of the benefits of action research is its collaborative nature and the validation that accompanies this kind of teamwork.

Along its active path to positive change, action research presents opportunities to develop and practice systematic reflection. Reflexive bracketing allows teacher-researchers to engage in more subversive purposes of action research, including challenging basic assumptions, challenging educational reform, and challenging objectivity (Mills, 2011). I used my professional journal to engage in reflective bracketing in three stages of this action research project: before, during, and after. As teacher-researchers, we bring knowledge and ideas to our action research

projects, often subconsciously anticipating certain "a priori outcomes" (Grant, 2007, p. 268). I know my action research has not escaped this a priori bias.

Two questions surfaced as areas of potential bias in my research: "for what type of learner is your curriculum designed?" and "who benefits from your curriculum and who doesn't?" (Dana, 2013, p.3). As someone who develops educational materials for PLT, I feel these resources are suited for many types of learners and will benefit countless individuals. PLT goes to great lengths to incorporate differentiated instruction methodologies with hands-on, inquiry-based, interdisciplinary lessons. PLT's educational materials embrace enough variety and diversity to appeal to many different kinds of teachers and learners. I realize this perspective has implementations for the action research carried out by this project. Project Learning Tree's materials and professional development cannot be everything to everyone. In identifying this bias, I was able to focus on target elements of PLT's professional development and educational materials to further benefit a single audience (ecological teachers and learners).

My continued review of relevant literature also led me to an epiphany related to personal perspective. I wrestled with the question: is Project Learning Tree a pedagogy (a way of teaching) or is it a curriculum (content to be taught)? If I understand Ecological Teaching and Learning as a pedagogy, does that dictate that PLT must be the latter? Or, are PLT and ETL both pedagogical approaches, and thus to some extent interchangeable? I believe this is a foundational question to my action research project, and my research served to further explore it via conference call conversations with my co-researchers.

Through deeper reflection, I have concluded that I am less comfortable with the science content side of PLT, and I am more comfortable conveying the program's fundamental philosophy (pedagogy). It is not that I do not understand or enjoy science content; I am simply

more excited by the PLT program's underlying philosophy, which happens to resonate profoundly with that of ETL. I used the advisory committee, ETL alumni survey, and professional journal to help keep this bias in check. Having this insight helped me focus on the larger purpose of both PLT and ETL. The content of these programs can change, and it often does. The five selected recommended pedagogies for PLT will, however, remain constant as educational content changes over time. It is important for any organization to regularly reflect on their philosophy, and this investigation can help PLT improve its design by connecting it more deeply to its mission.

Time and capacity were the largest limitations of this action research project. The actionable items that result from this investigation are enough to fulfill full time employment for an additional staff member at the national PLT office in Washington, DC. While the 10-week timeframe set by this project is indeed a limitation, the recommendations allow for the timeframe to be extended much further into the future. Two other project shortcomings included a small, electronic glitch with four of the ETL alumni survey questions and variance in the advisory group participation. I do not anticipate that either of these items had profound effects on the project results.

While this project gained validity through data triangulation, I believe Reason and Bradbury capture the true test of validity when they state, "an important question to ask, therefore, is whether the research is 'validated' by participants' new ways of acting in the light of the work?" (2006, p. 451). Will actions change, will teaching change, and/or will lives change as a result of my work to integrate PLT and ETL? I see potential for these results to affect the advisory group directly, PLT workshop participants indirectly, and finally (and ultimately!) students in classrooms who will benefit from curriculum and teacher trainings that integrate PLT

and ETL. Will this action research project help to make the world a better place? I fully expect positive outcomes, and I plan to keep working with Project Learning Tree to shape our organization, curriculum, nation, and world.

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Appendix A

Advisory Group Members

Susan Cox
Conservation Education Coordinator
USDA Forest Service
Northeastern Area State & Private Forestry
217 Mast Road
Exeter, NH 03833
(603) 868-7706
smcox@fs.fed.us

Sandy Derby
California PLT
Lesley University ETL Graduate (2011)
University of California Davis
San Jose, CA
(530) 394-7003
stderby@ucdavis.edu

Sarah Livesay
Projects Coordinator
Environmental Education
Association of Illinois
1505 N Broadway Avenue
Urbana, IL 61801
(217) 469 – 0289
s.livesay@comcast.net

Tim Rayworth
Northeast Regional Environmental
Education Coordinator
MA Dept. of Conservation and Recreation
P.O. Box 829
Carlisle, MA 01741
(978) 369-7834
tim.rayworth@state.ma.us

Bora Simmons, Ph.D.
Director, National Project for
Excellence in EE
University of Oregon
2635 Lincoln Street
Eugene, OR 97405
(541) 343-0714
borasimmons@gmail.com

Steve Scharosch
Steering Committee Member
Wyoming PLT
PO Box 157
Alcova, WY 82620
(307) 235-1829
abacus@tribcsp.com

Renee Strnad
North Carolina PLT State Coordinator
Lesley University ETL Graduate (2015)
NC State University – Extension Forestry
Campus Box 8008
Raleigh, NC 27695
(919) 515-5518
renee_strnad@ncsu.edu

Rick Zenn
Senior Fellow
World Forestry Center
4033 SW Canyon Road
Portland, OR 97221
(503) 488-2103
rzenn@worldforestry.org

Appendix B

Advisory Group Participation Invitation

Sent: Tuesday, August 27, 2013, 12:01 PM
Subject: An Invitation: Participate in Jaclyn's Project

Hi Friends,

Many of you know that over the past 18 months, I have been working to obtain my Masters of Science degree from Lesley University's Ecological Teaching and Learning program. If you can believe it, I'm approaching my final semester and doing my best to prepare for graduation in January, 2014. This means completing work on my thesis of sorts – a participatory action research project. It is, of course, related to Project Learning Tree, and here is where I hope to have your help.

My project requires that I create a small team that will work together over the course of 10 weeks this fall (Sept-Nov) to have input and offer guidance on my project. This means participating in 3 or 4 one-hour conference calls as well as reviewing and responding to summary documents during that same time period. I am reaching out to you as a trusted colleague, but more importantly as a treasured friend. I want these conversations to be engaging, enlightening, and fun… and I know the final product will serve well to inform PLT's upcoming revision of the PreK-8 Guide with your participation.

It is important you know that participation in this project is completely voluntary. It is possible that ideas, statements, and opinions made in our conversations will be reproduced in my final report. This research has been approved by Lesley University, and you are welcome to contact me for additional information at any time.

I plan to tell everyone more about my project on our first conference call, but before that, I need your commitment. So, what do you think? Are you able to participate? I would appreciate your response as soon as possible, but no later than next Tuesday, September 3. If your reply is yes, you can respond to the Doodle poll I've created to determine the date and time of our first conference call (please note that all times are marked as Eastern):
http://doodle.com/zqi8aq524tdv9vwk

Finally, I want to say thanks. If you've made it down this far in my email, you definitely deserve it. I have requested your participation because I highly respect you as an educator, and I know together we can do great things. I look forward to this experience – it really is going to be fun – and I would be absolutely honored if you'd join me.

Thanks for considering!

Cheers,
Jaclyn

PS – I have a 30+ page action research proposal already prepared (and no, you won't have to read it). Here's the crux: My project seeks to inform the ideal design and delivery for Project Learning Tree's (PLT) new pre-kindergarten through grade eight curriculum, with an emphasis on ecological teaching and learning (ETL). My main and sub questions are:

- In what ways can I develop ecological teachers and learners though Project Learning Tree's new pre-k – 8 curriculum's design and delivery?
    - Where do the pedagogies of PLT and ETL intersect?
    - How can an advisory group contribute to the effort to bring together the goals of PLT and ETL?
    - What kind of professional development would help educators meet student learning goals while also training teachers to support ETL pedagogies?
    - How can a focus on ETL improve PLT's ability to support teachers in meeting academic standards and STEM (science, technology, engineering, and mathematics) objectives?

Jaclyn Stallard
Manager of Education Programs

Project Learning Tree
1111 Nineteenth Street, NW, Suite 780
Washington, DC 20036
202-463-2754

Appendix C

Email Communication to Advisory Group for Conference Call 1

Sent: Wednesday, September 11, 2013, 3:01 PM
Subject: Conference Call: Mon, Sept 16, 2pm ET

Hi all,

Thanks for taking the time and energy to help with my graduate school action research project. I am excited to begin this process! At this time, I have confirmed eight participants on our advisory group. Attached you will find a roster so you know who will be involved in our conversations. Many of you already know each other and some of you are new to PLT, and either way, I'm thrilled to have all of you participate.

After reviewing the Doodle Poll, the best date and time for a conference call is next **Monday, September 16th**, from 2-3pm Eastern Time. To facilitate this call, we'll use ReadyTalk's audio and web conference system, and I have included the dial in instructions below. This system utilizes both audio and web conferencing for quick and easy document sharing. If you are, however, not able to log in via a computer on that date and time, please just join us on the audio call.

Methodology: To help with my project's data collection, I plan to employ the following two techniques:

- I will ask you to take notes. If you can please jot down a few notes during our call, that would help to greatly bolster my data. By no means do you have to take notes on everything. I'm interested in what you find compelling, what you are taking away from our conversations, and understanding more from your point of view. That being said, there is also no right or wrong way to take notes; you can scan a pen and paper document or email electronic text, notes can be in bullet form or written as a short summary paragraph. Whatever method you prefer will work for me. I will also remind you of this during our call.
- I will audio record our conference calls. This will help in case I need to go back and review pieces of our conversation at a later time. If this is a problem for you, please do not hesitate to let me know. I also want to insure you that the audio recording will not be made public; it will only be available to me.

Agenda: Here's a sneak peek into the highlights of next week's conversation:

- Data Collection – Reminder to take notes!
- What is Ecological Teaching and Learning (ETL)?
- ETL Pedagogy Wheel (attached)
- ETL and PLT – Areas of overlap
- ETL Alumni Survey
- Possible places to publish results?

Conference Call: Monday, Sept 16, 2:00pm, Eastern Time

Web Login *(simply click on this link 2pm Eastern… or a few moments before to ensure compatibility with your computer)*
Meeting URL: https://core.readytalk.com/prt?an=8667401260&ac=4632754

Audio Login *(remember to call in at 2pm Eastern as well!)*
Toll-Free: 866-740-1260
Access Code: 4632754

ReadyTalk Troubleshooting *(if you have trouble on the day of, try this since I'll be managing the call and won't be able to help you!)*
Support: U.S. and Canada: 800.843.9166 or help@readytalk.com

If you can't get the web portion to work, please just use the audio log in to join us via conference call!
To mute your line, press *6
To unmute your line, press *7

Thanks so much and I look forward to speaking with you soon. Have a great today!

Jaclyn Stallard
Manager of Education Programs, PLT
202-765-3609

2000 M Street NW, Suite 550
Washington, DC 20036

Appendix D

Supporting Information for Conference Call 1

What is Ecological Teaching and Learning (ETL)?

Ecological teaching and learning is not just a matter of pedagogy, but also philosophy. Ecological teaching and learning is representative of a new life-affirming mindset that all teachers—and, to a larger extent, all citizens and all Earth's human inhabitants—should adopt for a sustainable future. This philosophy embraces interconnectedness and systems thinking, challenging the Western notion of separateness. This type of teaching and learning develops and fosters an individual and collective "ecological consciousness" as humans move through life and relate to themselves, others, and the world around them. Practitioners of ETL seek a more holistic and participatory mindset than that which is traditionally offered by compartmentalized and reductionist Western theory.

Jaclyn's Action Research Project

My action research project seeks viable pathways to develop ecological teachers and learners through Project Learning Tree. The crux of my project will inform the ideal design and delivery for Project Learning Tree's (PLT) new PreK-8 curriculum. My main and sub questions are:

- In what ways can I develop ecological teachers and learners though Project Learning Tree's new PreK-8 curriculum's design and delivery?
    - Where do the goals of PLT and ETL intersect?
    - How can an advisory group contribute to the effort to bring together PLT and ETL?
    - What kind of professional development would help educators meet student learning goals while also training teachers to support ETL pedagogies?
    - How can a focus on ETL improve PLT's ability to support teachers in meeting academic standards and STEM objectives?

Teaching Pedagogies: ETL and PLT

Many of the pedagogies of ETL overlap with those of PLT. The ETL "pedagogy wheel" organizes the 29 ETL pedagogies into three tiers that scaffold its philosophy. Since the integration of these 29 pedagogies into PLT is beyond the scope of this study, I have chosen five with significant overlap. I selected these five pedagogies based on my intimate understanding of the PLT program in my current role as Manager of Education Programs for the National PLT Office in Washington, DC. They are environmental education, place-based education, project-based education, experiential education, and systems theory.

Selecting only five pedagogies is difficult because there is overlap with many of them. Further, reducing and simplifying the ETL theoretical scaffolding goes against the very strengths associated with the ETL philosophy my project seeks to promote. The nature of ETL is that it is broad, inclusive, and interconnected, as opposed to discrete, defined, and differentiated. However, I will just use these five pedagogies as a starting point to explore ways in which classroom teachers might begin to learn more about ETL pedagogies, exploring ideas for integrating it into their teaching practice using PLT.

Appendix E

Survey Ideas Generated by Conference Call 1

ETL Alumni Survey, Draft Questions
September 16, 2013

- Demographic questions (where do they work, what grade level, rural vs urban)
- At beginning: If you had a magic wand – and not constrained by test scores and academic pressures – what would you need to do this work? What would be most essential to your success? (Creating more ETL'ers)
- What pieces of ETL do meet STEM/ NGSS/ CC well?
- What initiative is your school/ center/ organization focused on at the moment?
- What resources (curricular materials, field trips, etc.) are you currently using to teach ETL? Which ones do you want to be using/ have access to? What type of resources do you need to do this work? What's missing out of the resources that you have experienced or have access to?
- Community involvement, human resources/ capital?
- Team teaching– Who do you work closely with? Who helps you do this work? Teachers/ partners/ parents/ resource professionals/ community members
- Solo vs. Support: How do you do the work that you do? What/ who are your supports? (individual teacher vs district support)
- How supportive is your administration in ETL? Is there support for you to attend teacher professional development? Do you have mandatory PD? What are the resources available to help you bring in new curricular resources?
- What are the crucial components of a good PD program?
- How do you fill in the gaps? What have you learned since ETL that has helped you to execute these ideas? How to bring others up to speed?
- How do you communicate ETL?
- What activities/ projects are your students doing w/i and w/o of classroom time (project-based) to connect with ETL philosophy?
- Success stories of ETL in practice?
- At end: What can you do without? What is your experience with what's NOT working?
- How to broaden the conversation… and keep it going…?!

Appendix F

Action Items from Conference Call 2

Sent: Tuesday, October 08, 2013, 3:20 PM
Subject: Follow Up: Action Items from Conference Call 2

Hi all,

Thanks for your participation on the second conference call today. Your help in thinking through some of those survey questions is much appreciated.

I wanted to summarize the "action items" for inclusion in your notes. If you have any questions on them, or are in need of additional clarification, please just let me know:

- On the call, we discussed the two circle charts on Pages 1 and 2 of the document entitled "Conf Call 1 – Data Analysis." In describing this project and its results to others, do you think I should include one or both charts? If you have a preference over one is shared, please select it and briefly describe why.

- Survey question 4 now reads: How often do you use the following supplemental environmental education resources? I will use a Likert scale (Extremely Often, Very Often, Moderately Often, Somewhat Often, Not at all) to quantify responses. I want to include PLT, WET, and WILD in this question, but I would also like to know your ideas for additional resources to include. Please name 3 more (such as FOSS, Facing the Future, Food, Land, and People, etc.).

- I articulate my current and possible action research sub-questions in the second document attached. I would love for you to help me assess my current sub-questions (Are they still relevant? Should any be eliminated? Should any be added?) and also help me think about possible new sub-questions. What might be missing? Should this project focus more on PLT's curriculum or professional development elements (versus continuing to recognize and explore both)?

I hope these 3 bullets help to organize your thoughts. Remember, there's no wrong way to take notes, and please submit them when you can. Feel free to also voice any other thoughts or concerns you didn't find room to explore on the call.

Thanks again for your continued interest and participation.

Jaclyn

PS - If you were unable to participate on the call today, please feel free to weigh in if these action items make sense to you. I can also share the audio recording of today's call, if you are interested in hearing what you missed!

Appendix G
Final Copy of ETL Alumni Survey

I am currently a student of Lesley University's Ecological Teaching and Learning Master's Program. For the past seven years, I have worked as the Manager of Education Programs for Project Learning Tree (PLT), a nationwide program that develops and distributes environmental education curricula and professional development.

I am requesting your participation in my action research project, which focuses on educator practice of ecological teaching and learning pedagogies. If you have graduated from Lesley University's Ecological Teaching and Learning (ETL) program and are working to implement ETL pedagogies into your teaching practice, you are eligible to participate.

I am asking you to be a part of study that examines viable ways to incorporate ETL into teacher practice, as well as explore the resources that might allow for easier and more seamless ETL integration. This project may help identify strategies for incorporating ETL pedagogies and practices into PLT's curricular materials and professional development offerings.

This 25-question survey will take approximately 10 minutes to complete and is comprised of multiple choice, Likert scale, and short answer responses. Participation is voluntary and all responses will remain confidential. I will ask for your email address so that I may share a summary of the survey results, but providing this piece of information is not required. You will also have the option to volunteer yourself for a short follow-up interview if it is necessary to clarify any of your responses to deepen my understanding of the survey results.

This research has been approved by Lesley University, and I greatly appreciate your time and consideration. If you would like further information, I invite you to please contact me at any time.

Respectfully,
Jaclyn Stallard
Manager of Education Programs, Project Learning Tree
jstallard@plt.org

Cultivating Ecological Teachers and Learners Using Project Learning Tree

PART A - About You and Your Work Setting

First, please tell us a little bit about yourself and where you work.

*1. What is your primary occupation?

- ◯ Preschool educator
- ◯ K-8 classroom teacher
- ◯ High school teacher
- ◯ School administrator
- ◯ Non-formal educator (nonprofit, 4H, scouts, museums, nature centers, etc.)
- ◯ Resource manager (state agency, government, etc.)
- ◯ College level instructor
- ◯ Education consultant
- ◯ Stay-at-home Mom or Dad
- ◯ I am currently in between jobs
- ◯ I am no longer in the education field

Other (please specify)

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***2. In which U.S. state (or other country) do you work? Check all that apply.**

- [ ] Alabama
- [ ] Alaska
- [ ] Arizona
- [ ] Arkansas
- [ ] California
- [ ] Colorado
- [ ] Connecticut
- [ ] Delaware
- [ ] District of Columbia
- [ ] Florida
- [ ] Georgia
- [ ] Hawaii
- [ ] Idaho
- [ ] Illinois
- [ ] Indiana
- [ ] Iowa
- [ ] Kansas
- [ ] Kentucky
- [ ] Louisiana
- [ ] Maine
- [ ] Maryland
- [ ] Massachusetts
- [ ] Michigan
- [ ] Minnesota
- [ ] Mississippi
- [ ] Missouri
- [ ] Montana
- [ ] Nebraska
- [ ] Nevada
- [ ] New Hampshire
- [ ] New Jersey

Cultivating Ecological Teachers and Learners Using Project Learning Tree

- [ ] New Mexico
- [ ] New York
- [ ] North Carolina
- [ ] North Dakota
- [ ] Ohio
- [ ] Oklahoma
- [ ] Oregon
- [ ] Pennsylvania
- [ ] Puerto Rico
- [ ] Rhode Island
- [ ] South Carolina
- [ ] South Dakota
- [ ] Tennessee
- [ ] Texas
- [ ] Utah
- [ ] Vermont
- [ ] Virginia
- [ ] Virgin Islands
- [ ] Washington
- [ ] West Virginia
- [ ] Wisconsin
- [ ] Wyoming

Other (please specify)

***3. How would you best describe your work setting?**

- ◯ Urban
- ◯ Suburban
- ◯ Rural
- ◯ Natural area

Cultivating Ecological Teachers and Learners Using Project Learning Tree

4. How often do you use the following supplemental environmental education resources?

	Not at All	Somewhat Often	Moderately Often	Very Often	Extremely Often
Project Learning Tree (PLT)	◯	◯	◯	◯	◯
Project WET	◯	◯	◯	◯	◯
Project WILD	◯	◯	◯	◯	◯
The GLOBE Program	◯	◯	◯	◯	◯
The Leopold Education Project	◯	◯	◯	◯	◯
FOSS Kits	◯	◯	◯	◯	◯

Other (please specify)

5. What is your familiarity with the following standards and teaching strategies?

	Not at All Familiar	Somewhat Familiar	Moderately Familiar	Very Familiar	Extremely Familiar
Next Generation Science Standards	◯	◯	◯	◯	◯
Common Core State Standards – English Language Arts	◯	◯	◯	◯	◯
Common Core State Standards – Math	◯	◯	◯	◯	◯
STEM (Science, Engineering, Technology, and Mathematics)	◯	◯	◯	◯	◯
21st Century Skills	◯	◯	◯	◯	◯
Digital Learning	◯	◯	◯	◯	◯

Cultivating Ecological Teachers and Learners Using Project Learning Tree

6. How important is it for your work that programs like Project Learning Tree (PLT) align with these standards and teaching strategies?

	Not at All Important	Somewhat Important	Moderately Important	Very Important	Extremely Important
Next Generation Science Standards	◯	◯	◯	◯	◯
Common Core State Standards – English Language Arts	◯	◯	◯	◯	◯
Common Core State Standards – Math	◯	◯	◯	◯	◯
STEM (Science, Engineering, Technology, and Mathematics)	◯	◯	◯	◯	◯
21st Century Skills	◯	◯	◯	◯	◯
Digital Learning	◯	◯	◯	◯	◯

Other (please specify)

Cultivating Ecological Teachers and Learners Using Project Learning Tree

PART B - Your Current ETL Practice

Please reflect on your teaching practice since graduating from Lesley's Ecological Teaching and Learning (ETL) program. If you are not currently in a teaching role (either formal or nonformal), please answer the following questions based on your teaching experience since graduating from ETL.

***7. Do you feel as if you have successfully incorporated ETL into your teaching practice?**

- ◯ Yes
- ◯ No
- ◯ Somewhat

Explain

***8. Approximately how much time do you spend teaching outside or in the field?**

- ◯ < 10%
- ◯ 10-40%
- ◯ 40-60%
- ◯ 60-90%
- ◯ >90%

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***9. Which 5 pedagogies from the list below do you employ most often? (Please select a total of 5.)**

- [ ] Action & Inquiry-based Research
- [ ] Adult & Popular Education
- [ ] Brain-based Learning
- [ ] Character Education
- [ ] Constructivist Learning
- [ ] Creative Arts in Learning
- [ ] Deep Ecology
- [ ] Education for Sustainability
- [ ] Environmental Education
- [ ] Experiential Education
- [ ] Feminist: Midwife Teaching
- [ ] Global Education
- [ ] Holistic Education
- [ ] Humane Education
- [ ] Indigenous Education
- [ ] Intercultural Education
- [ ] Internship/ Mentor Model
- [ ] Learning Community: Collaborative Learning
- [ ] Multiple Intelligences
- [ ] Natural Science Education
- [ ] Outdoor Adventure Education
- [ ] Peer Evaluation
- [ ] Place-based Education
- [ ] Project-based Learning
- [ ] Self-directed Learning
- [ ] Service Learning
- [ ] Storytelling
- [ ] Systems Theory
- [ ] Transformational Learning

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***10. In which discipline areas do you incorporate ETL principles? (Check all that apply.)**

- [ ] Math
- [ ] Reading/ Writing (English Language Arts)
- [ ] Arts
- [ ] Science
- [ ] Social Studies
- [ ] Other

Other (please specify)

11. How often do you use the following resources to teach ETL?

	Not at All	Somewhat Often	Moderately Often	Very Often	Extremely Often
Supplemental curricular materials	◯	◯	◯	◯	◯
Off-site field trips	◯	◯	◯	◯	◯
On-site outdoor experiences	◯	◯	◯	◯	◯
Guest speakers (resource professionals, parents, community leaders)	◯	◯	◯	◯	◯
Technology (computers, probewear)	◯	◯	◯	◯	◯
Manipulatives (tools, models, samples)	◯	◯	◯	◯	◯
Sensory items (video, audio, touchables)	◯	◯	◯	◯	◯

Other (please specify)

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***12. Who supports you in your ETL teaching practice? Check all that apply.**

- [ ] Online Forum
- [ ] Classroom Parents
- [ ] Resource Professionals (nature center staff, museum staff, foresters)
- [ ] Administrators
- [ ] Volunteers
- [ ] Other Teachers / Teachers Aides
- [ ] Community Members / Organizations (farmers market, elected officials, rotary)
- [ ] Professional Learning Community

Other (please specify)

13. How supportive is your administration (boss, leadership, supervisors, etc.) in your teaching of ETL?

Not at All Supportive	Somewhat Supportive	Moderately Supportive	Very Supportive	Extremely Supportive
◯	◯	◯	◯	◯

14. Do you have mandatory professional development commitments?

- ◯ Yes
- ◯ No
- ◯ Sometimes

15. Is there support for you to attend educator professional development?

- ◯ Yes
- ◯ No
- ◯ Sometimes

16. What, if any, broad-based initiative is your place of employment (school, center, organization, etc.) most concerned with at the moment?

Cultivating Ecological Teachers and Learners Using Project Learning Tree

PART C - Your Desired ETL Practice

After reflecting on your current ETL practice, this section is more forward thinking and focused on the future. It aims to reveal additional needs (resources, support, teaching strategies, etc.) that will serve to further enhance your ETL practice.

17. How much time do you wish you were teaching outside and in the field?

- ◯ < 10%
- ◯ 10-40%
- ◯ 40-60%
- ◯ 60-90%
- ◯ >90%

*18. Which resource would best help you to spend more instruction time outdoors?

- ◯ Better weather conditions
- ◯ Lesson plans / teaching activities
- ◯ Professional development
- ◯ Chaperones/ Assistants/ Teachers' Aides
- ◯ Planning time
- ◯ Success stories to learn from

Other (please specify)

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***19. Which 3 pedagogies do you wish you could employ more? (Please select a total of 3.)**

- [ ] Action & Inquiry-based Research
- [ ] Adult & Popular Education
- [ ] Brain-based Learning
- [ ] Character Education
- [ ] Constructivist Learning
- [ ] Creative Arts in Learning
- [ ] Deep Ecology
- [ ] Education for Sustainability
- [ ] Environmental Education
- [ ] Experiential Education
- [ ] Feminist: Midwife Teaching
- [ ] Global Education
- [ ] Holistic Education
- [ ] Humane Education
- [ ] Indigenous Education
- [ ] Intercultural Education
- [ ] Internship/ Mentor Model
- [ ] Learning Community: Collaborative Learning
- [ ] Multiple Intelligences
- [ ] Natural Science Education
- [ ] Outdoor Adventure Education
- [ ] Peer Evaluation
- [ ] Place-based Education
- [ ] Project-based Learning
- [ ] Self-directed Learning
- [ ] Service Learning
- [ ] Storytelling
- [ ] Systems Theory
- [ ] Transformational Learning

Cultivating Ecological Teachers and Learners Using Project Learning Tree

***20. Which single resource type would most benefit you in more fully implementing ETL?**

- ◯ Human Resources (teachers aides, volunteer support)
- ◯ Financial Resources (grants, monetary incentives/ support)
- ◯ Social/ Cultural Resources (community participation, diverse perspectives)
- ◯ Material Resources (hands-on tools, supplies, manipulatives)
- ◯ Intellectual Resources (knowledge, skills, know-how)

Other (please specify)

***21. Which of the following would most benefit a professional development program (PDP) focused on ETL? (Select your top 2.)**

- ☐ PDP is long-term, sustained, and intensive
- ☐ PDP adheres with set standards and policies
- ☐ PDP clearly defines and prioritizes outcomes
- ☐ PDP creates a collaborative, reflective learning community
- ☐ PDP offers individual and active learning opportunities
- ☐ PDP is supported by online tools and technology

***22. What are your top 2 impediments in implementing ETL? (Select only 2.)**

- ☐ Educator skills / knowledge/ expertise
- ☐ Administrative support (or lack of)
- ☐ Classroom assistance (or lack of)
- ☐ Money (or lack of)
- ☐ “Doom and Gloom” nature of issues/ topic areas
- ☐ Importance of teaching to the test
- ☐ Time (or lack of)

Other (please specify)

23. If you had a magic wand – and were not limited by any constraints – what might you do to support and sustain ETL in practice?

Cultivating Ecological Teachers and Learners Using Project Learning Tree

THANK YOU!

Thank you for taking the time to offer your thoughts and insight. The results of this survey will greatly inform an action research project investigating viable means to cultivate more Ecological Teachers and Learners.

24. Please provide your email address if you are interested in receiving a summary of the survey results.

25. Finally, if you are willing to make yourself available for any follow-up questioning necessary to clarify data collected by this survey, please enter your name and phone number in the space below.

Appendix H

Possibilities to Publish

This list represents ideas for places to possibly publish, or at least share, this project's action research findings. These ideas were generated and discussed with the PLT advisory group:

- PLT's Branch e-Newsletter
- North American Association for Environmental Education (NAAEE) Affiliate Network
- Create and distribute an executive summary to state-level environmental education associations and/or Offices of Environmental Education
- Center for Ecoliteracy's Blog
- Green Teacher
- Environmental Education Clearinghouse
- Applied Journal of Environmental Education and Communication
- Journal of Action Research
- Educational Leadership (and/ or ASCD publications: newsletters, blog, etc.)
- Science Journal Publication
- Journal of Interpretation Research (National Association for Interpretation)
- Visitor Studies Association (VSA) Journal and Archive
- Submit conference session proposals: NAAEE and PLT