

A FOREST FOR EVERY CLASSROOM:
PLACE-BASED PROFESSIONAL DEVELOPMENT THROUGH THE SEASONS

by
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ABSTRACT

Educators from western Montana participated in a year-long series of place-based professional development workshops that aimed to give them the skills to more fully incorporate their local place into their teaching. Pre and post surveys and interviews were used to assess the effect of the program on the teachers' place based knowledge and teaching practices. Teachers were found to have greater knowledge of their local environment, to teach more lessons outside of the classroom, to more often use local themes to organize their teaching, to more often engage students in service learning, and to more often involve community members in their teaching as a result of their participation in the program. The relationships teachers built with each other and with the workshop organizers and presenters from their community were found to be the most valuable part of the program while the program assignments were found to be the most challenging piece.

INTRODUCTION AND BACKGROUND

A Forest For Every Classroom (FFEC) is a year-long professional development workshop series for educators focused on place-based approaches to education. In this program, teachers gather with community professionals and educational specialists in every season throughout the year. The workshops include hands-on activities presented by scientists, foresters, loggers, educators, naturalists, artists, musicians, industry experts, cultural representatives, and others who are passionate about land stewardship. FFEC is a multi-disciplinary, field-based exploration that includes instruction in using authentic field-work methods which teachers can then use with their students. Each session builds skills and knowledge about local ecology, culture, economy and outdoor teaching. The FFEC program integrates service learning, creative and innovative curriculum development and knowledge and awareness of the historic and cultural stories of place. Teachers who participate in FFEC increase their own knowledge so that they are able to foster student understanding of and appreciation for their natural and human communities. Participants complete the program having created a quality curriculum and contacts within their community, both of which they can use as resources to provide their students with lasting connections between the classroom and the surrounding natural and human communities.

At the heart of FFEC is an approach to teaching and learning called place-based education (PBE). PBE helps students learn about and connect to the natural and human elements of their local environment through active, hands-on, real-world and ongoing classroom and field experiences. FFEC is grounded in the belief that students who are immersed in the interdisciplinary study of their place will be more motivated to learn and

to be involved in the stewardship of their communities and surrounding lands (National Park Service, 2013a).

FFEC was developed in Vermont in 2000 by a team of partners including the Marsh-Billings-Rockefeller National Historic Park, Shelburne Farms, the Conservation Study Institute, the Green Mountain National Forest and the Northeast Office of the National Wildlife Federation (National Park Service, 2013b). FFEC was adapted for use in Montana in 2009, also through collaboration between local non-profit organizations and government agencies. I was already involved with the steering committee for Montana's replication of FFEC in the Lower Clark Fork and Bitterroot Watersheds when I decided to base my capstone project on this program. I believe in the values and goals of FFEC, and I wanted to find out how well the program performed at educating teachers about place-based education and motivating them to implement it in their classrooms. I also wanted to investigate how the knowledge I was gaining about place-based education through my involvement in FFEC affected the type of educational programs I decided to implement in my position as Healthy Kids ~ Healthy Forests Field Coordinator for the Bitter Root Resource Conservation and Development Area, a non-profit organization in Hamilton, Montana.

From 2009-2012, 51 teachers from Helena, Montana, and the surrounding towns participated in the first 3 Montana replications of FFEC which were based around the Elkhorn Mountains. In order to help me focus my research questions and to start to understand the impact FFEC has on educators, I chose to interview this group in March 2012. The responses from these interviews indicated that some of the most important parts of the program were the variety of experiences offered and the chance to develop

working relationships with the natural resource specialists who had led activities throughout the program. A large majority of the teachers mentioned that the relationships they formed with other participants were also an important part of the program. The majority of those interviewed felt that participating in FFEC had made them more confident in their ability to incorporate their local place into their teaching. One common reason for this was they were introduced to professionals who could assist them with implementing their curriculum. Thus teachers did not feel they needed to have a solid mastery of all content knowledge about their place. Another common reason for their increase in confidence was that they had gained experience in creating lessons that meshed their teaching with their place.

From April 2012 to January 2013, 16 educators from western Montana's Missoula and Ravalli counties participated in the Lower Clark Fork replication of FFEC. The participants ranged from elementary teachers to high school teachers with teaching specialties in science, special education, social studies, English, math, elementary education, art, and agriculture. The trainings were organized and taught by a team of partners from non-profit organizations, government agencies and schools, and took place within the Lower Clark Fork and Bitterroot watersheds within Missoula and Ravalli Counties. The land base in Missoula County is 49% federal land, 9% state land, 6% Indian Trust and Bureau of Indian Affairs land and 36% private land. Ravalli County is made up of 74% federal land, 3% state land and 24% private land (Montana State Library, 2013). Learning about place in these counties where the majority of land area is national forests, state forests, national wildlife refuges, ranches and rural neighborhoods means getting outdoors to experience the natural and human communities.

The purpose of my research was to investigate how participation in A Forest For Every Classroom affected the participants' and the researcher's place-based knowledge and teaching practices. My main research question was: What is the impact of A Forest For Every Classroom on teachers who participate in this professional development program? My sub questions were:

1. How does participating in FFEC affect teachers' knowledge of their local environment?
2. How does participating in FFEC affect the frequency with which teachers incorporate information about their local environment into their teaching?
3. How does participating in FFEC affect the number of classes teachers conduct in their school-yard, community and the surrounding natural places?
4. How does participating in FFEC affect the frequency with which teachers engage community members to work with their students?

CONCEPTUAL FRAMEWORK

Though place-based education (PBE) is a relatively new term, the concept has been promoted for more than 100 years under other names (Woodhouse & Knapp, 2000). Some of the educational techniques that contain many of the same elements as PBE are community-oriented schooling, community-based learning, environmental education, bioregional education, experiential learning, and contextual learning as well as sustainability education, service learning, project-based learning, using the environment as an integrating context, place-conscious education, ecoliteracy, ecological identity, and pedagogy of place (Gruenewald, 2003; Powers, 2004; Smith, 2007; Smith & Sobel, 2010; Woodhouse & Knapp, 2000). A difference between environmental education and place-

based education is that environmental education focuses only on the natural environment while place-based education addresses both the natural and social environments (Smith, 2007). At the heart of PBE is the value of learning from and nurturing specific places, communities or regions (Sobel, 2005). David Sobel gives the following definition of place-based education:

Place-based education is the process of using the local community and environment as a starting point to teach concepts in language arts, math, social studies, science and other subjects across the curriculum. Emphasizing hands-on, real-world learning experiences, this approach to education increases academic achievement, helps students develop stronger ties to their community, enhances students' appreciation for the natural world, and creates heightened commitment to serving as active, contributing citizens. Community vitality and environmental quality are improved through the active engagement of local citizens, community organizations, and environmental resources in the life of the school (Sobel, 2005, p.7).

In PBE, the local environment is the foundation for learning (Chalwa & Escalante, 2007; McInerney, Smyth & Down, 2011; Meichtry & Smith, 2007; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Semken & Freeman, 2008; Smith 2002a; Smith 2007; Smith & Sobel, 2010; Woodhouse & Knapp, 2000). Place-based curriculum is multidisciplinary and often created by the teacher and students (Chalwa & Escalante, 2007; Lieberman & Hoody, 1998; Semken & Freeman, 2008; Smith, 2002a; Smith, 2002b; Woodhouse & Knapp, 2000). Topics that are frequently a part of place-based learning curriculum include nature and ecology studies, local culture,

geography, local economy and politics (Place-based Education Evaluation Collaborative, 2010; Smith, 2002a; Smith, 2002b; Smith, 2007; Woodhouse & Knapp, 2000).

Place-based education lessons can take place in the classroom, on the school grounds, in the community, or on public lands (Chalwa & Escalante, 2007; Place-based Education Evaluation Collaborative, 2010; Smith, 2007). PBE can be implemented in both rural and urban environments and is effective with elementary students through high school students (Place-based Education Evaluation Collaborative, 2010). Students are usually engaged in active lessons and collaborative learning with both their classmates and their teachers (Chalwa & Escalante, 2007; Lieberman & Hoody, 1998; Meichtry & Smith, 2007; Semken & Freeman, 2008; Woodhouse & Knapp, 2000). Teachers often act as learning guides rather than as instructors (Smith, 2002a; Smith, 2002b). Service learning is a component of PBE that gets students into the community to do valuable work (Place-based Education Evaluation Collaborative, 2010; Smith, 2002a; Smith, 2007; Smith & Sobel, 2010; Woodhouse & Knapp, 2000). Place-based education is multigenerational as students learn from and interact with a variety of community members who help direct them in their community projects (Lieberman & Hoody, 1998; McInerney, Smyth & Down, 2011). The projects often require students to use problem-solving skills and result in students demonstrating knowledge by producing a finished product such as brochures for a nature trail or public speeches (Lieberman & Hoody, 1998; Meichtry & Smith, 2007; Place-based Education Evaluation Collaborative, 2010; Smith, 2002a; Smith, 2002b; Smith, 2007).

Learning about their local area is relevant to students' lives and leads to them be more engaged in their learning than students in traditional classrooms (Chalwa &

Escalante, 2007; Lieberman & Hoody, 1998; McInerney, Smyth & Down, 2011; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Smith, 2002b; Smith & Sobel, 2010; Sobel, 2005). This greater enthusiasm for learning leads to better attendance and fewer discipline problems in schools (Chalwa & Escalante, 2007; Lieberman & Hoody, 1998; Powers, 2004). Students who are engaged in place-based learning show more depth of understanding of science concepts when compared to students who learn in a traditional classroom (Lieberman & Hoody, 1998; Powers, 2004; Smith, 2002a; Sobel, 2005). These students also demonstrate an increased appreciation of the natural world (Lieberman & Hoody, 1998; Powers, 2004; Smith, 2002a; Sobel, 2005). PBE has been shown to improve students' grades and test scores as well as their critical thinking skills (Chalwa & Escalante, 2007; Lieberman & Hoody, 1998; Meichtry & Smith, 2007; PEEC, 2010; Powers, 2004; Smith, 2002a).

When teachers and students begin to seek resources in their communities to help them learn more about their place, partnerships develop between schools and the communities where they are located (McInerney, Smyth & Down, 2011; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Smith, 2002a; Smith & Sobel, 2010; Sobel, 2005). The service learning projects that students undertake, with help from community members, often lead to revitalizing the community and increasing civic participation by students and other community members who have become involved in the project (McInerney, Smyth & Down, 2011; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Smith & Sobel, 2010; Sobel, 2005). Through participation in community projects, students increase their leadership skills and begin to see themselves as vital members of their community (Smith, 2002b; Smith & Sobel,

2010; Winther, Volk & Schrock, 2002). As a result of participation in place-based education, students improve their environmental and community stewardship skills and make improvements in the schoolyard, community or local environment (McInerney, Smyth & Down, 2011; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Smith, 2002b; Smith & Sobel, 2010; Sobel, 2005). The knowledge that students gain about their local environment and the skills they gain through service learning projects serve to connect them to where they live (Meichtry & Smith, 2007; Smith, 2002a; Smith & Sobel, 2010; Sobel, 2005).

Using a place-based approach to teaching not only benefits students, but energizes and revitalizes teachers (Gruenewald, 2003; Place-based Education Evaluation Collaborative, 2010; Powers, 2004; Smith & Sobel, 2010; Winther, Volk & Schrock, 2002). However, educators face some barriers when implementing place-based curriculum. Barriers to teachers taking students outside for lessons include time constraints, variable weather, classroom management issues, teachers feeling they have inadequate content knowledge to teach outdoors, general logistics, and lack of administrative support (Bloom, 2010; Smith, 2007). Minor obstacles include emphasis on state testing and state standards, cost of transportation, lack of funding, lack of planning time, and lack of transportation (Ernst, 2007; Smith, 2007). These were found to be minor barriers for teachers with some experience implementing PBE, but they may be major barriers for teachers who are new to PBE (Ernst, 2007).

Additional barriers for implementing PBE include that teachers must take the extra time to be creators of their own curriculum and to link this curriculum to the standards. Teachers may be contacted by inquiring parents who are used to school

classes formatted to closely follow the text-book and who are unaware of the value of a curriculum that consists of a series of projects throughout the year. A barrier for teachers in the beginning can be finding community organizations and agencies that are willing to help provide learning experiences for students and who will see children as responsible enough to develop and implement community projects (Smith, 2002a). Skepticism from supervisors and peers about this teaching method, conflicts with school schedules, concerns about liability and access to parent volunteers for excursions away from the school grounds were also found to be obstacles for teachers implementing PBE. Some key lessons were learned from PBE programs in Hawaii. For teachers, changing their way of teaching was not easy. It was difficult for some of them to let go of having complete control of their classroom and let their students determine the service learning project they wanted to do. It was also hard for many teachers to get used to community members taking part in educating their students (Smith, 2007).

Professional development in place-based education may be a way to encourage more teachers to overcome these barriers and experiment with this educational format. Increasing teachers' environmental literacy and environmental sensitivity and helping them acquire a more positive attitude about the environment may increase the probability that they will implement this teaching method (Ernst, 2007). Teachers who work in a school that has a climate supportive of PBE and multiple teachers who use this method are also more likely to use PBE themselves (Emekauwa, 2004; Ernst, 2007). Professional development that involves practicing interdisciplinary instruction and project-based instruction and which includes an opportunity to practice developing PBE curriculum could help teachers feel more competent to implement PBE. Experiences that help them

get to know and connect to their natural environment as well as a participation in a project where their own environmental actions make a difference could also help teachers feel more competent in implementing PBE (Ernst, 2007). Strong administrative support plays an important role when teachers adopt a new teaching strategy, so professional development efforts involving school administrators may also be useful (Ernst, 2007; Lieberman & Hoody, 1998).

Specific experiences often lead educators to implement place-based education methods. These experiences include teachers redeveloping their own sense of wonder for the natural world; building relationships with other teachers who are using PBE; successfully overcoming challenges they face while beginning to implement PBE and gaining the knowledge, skills and confidence needed to implement PBE (Rosenthal, 2011). Teachers are more likely to continue using new instructional approaches when learning the new technique requires a large amount of their time and effort as the time and effort they put into mastering the new strategies help them integrate the new concepts and approaches into their teaching methods (Winther, 2005 in Ernst, 2007).

Professional development in PBE is best when it takes place in a location that is local for the participants so what they learn will be relevant to them and to their teaching. Successful professional development in PBE is experiential and includes community-based experts with various topics of expertise (Meichtry & Smith, 2007). Getting teachers involved in working with community partners during PBE professional development increases the likelihood that students will end up working on projects that are of real value to the community (Powers, 2004). It is important that the professional development sessions include time for participants to reflect on their learning and provide

them with ongoing support (Meichtry & Smith, 2007). Suggestions for successful professional development in environmental education, which is also relevant to professional development in PBE, is that it be hands-on, community based, and centered on the interests of the participants (Wade, 1996).

An evaluation of four place-based education programs found that strengths of existing PBE professional development include high-quality program staff, sustained programs, creation of networks among teachers, exposure to resources including community members knowledgeable about their place, exposure to places for potential service-projects and field trips, and access to printed matter about local topics. The most effective trainings included realistic examples of PBE and chances for teachers to practice PBE and be active participants. If teachers were given these experiences, they were more likely to have the confidence to implement similar activities with their own students (Powers, 2004).

Teachers' behaviors changed as a result of their training in PBE. Teachers taught with more depth, increased their interdisciplinary teaching, assumed more of a leadership role in the school, had stronger curriculum planning skills and increased their use of service learning projects as part of the curriculum (Powers, 2004). Environmental education professional development affected teachers by revitalizing their teaching and empowering them to broaden their teaching styles to include methods other than lecture. The professional development made teachers' participation in their instructional teams more meaningful and increased the amount of project learning done in their classrooms. The teachers' leadership roles in school were enhanced because other teachers were curious to learn from them about this new way of teaching (Winther, Volk & Shrock, 2002).

A challenge faced by teachers who were involved in environmental education professional development was feeling overwhelmed when learning a new way of teaching. One reason teachers felt overwhelmed was because they thought they did not have enough background in ecology content to teach environmental education. Another reason for feeling overwhelmed was because the expectations of the program were very different from how they were used to teaching. A third reason was that changing their educator role from instructor to guide was a big adjustment (Winther, Volk & Shrock, 2002). Those involved in PBE professional development may also face similar challenges.

In trainings that took place during the school year, teachers lacked the time to devote to changing their curriculum in the middle of the school year. The use of PBE was more sustainable in schools in which all of the teachers were trained in how to implement PBE. This is due to the buy-in from the entire school and the support this provides to teachers. Formats that used a professional development model were effective because the participants were often already interested in learning about and implementing PBE. The ideal place-based education training model may be a combination of school-wide trainings and small-group professional development activities (Powers, 2004).

METHODOLOGY

The goal of this capstone project was to determine the effectiveness of the first replication of A Forest For Every Classroom (FFEC) in the Lower Clark Fork and Bitterroot watersheds of western Montana. A team of partners from schools, government agencies and non-profit organizations worked together to implement this program for teachers from Ravalli and Missoula Counties. The participants attended overnight trainings for two days in April 2012, five days in June 2012, two days in September 2012

and two days in January 2013. Nineteen teachers began the program and 16 completed all of the requirements and graduated from the program. The research methodology for this project received an exemption by Montana State University's Institutional Review Board and compliance for working with human subjects was maintained.

Assignments for the course included creating a "tree book" that contained samples and information about 10 native tree species, developing a forest-based teaching unit of 14 place-based lessons that involved a service-learning component and responding to journal prompts at every workshop. A final assignment was to submit a reflective writing piece at the end of the program telling the incoming group of workshop participants the teachers' perspective on the program. To be eligible for the program, each applicant needed to provide a letter of support from their administrator, answer three short-answer questions describing their qualifications for the program and commit to attending all workshop sessions.

In April, the workshop series began with a two-day session focusing on the Clark Fork River ecosystem. Teachers learned about the area from a local river expert and then worked in groups to sculpt the Lower Clark Fork watershed in the sand along the river. The group also learned about mule pack trains, practiced identifying local trees and learned about principles and best practices of place-based education. The workshop concluded with a reflective activity and a look forward to the summer sessions.

In June, the group met for two different sessions separated by a free weekend. They spent two days at a ranch in the Blackfoot Valley where they experienced topics and issues related to cattle ranching, trumpeter swan reintroduction, native plants, noxious weeds and botanical illustration. Wildlife biologists led teachers in practicing

bird watching skills and the group learned about efforts to protect wildlife habitat in this part of the state. Participants then learned tips from a fellow teacher about taking students outside for lessons.

During the second June session, the group spent three days camping in the northern Bitterroot Valley. They learned from a FFEC graduate about her service learning project, visited a forest on private land to learn how the homeowner had managed his private forest to reduce the potential for severe wildfires, and practiced forestry skills such as coring and measuring trees and plot sampling (Figure 1). They also visited an organic farm, collected water monitoring data from a stream, learned about the natural and cultural history of a nearby state park and participated in activities to learn more about forest ecology, fire behavior and fire ecology. Teachers began to plan their place-based curriculum units during this session.



Figure 1. Teachers conducting forest plot survey (photo M. Hayes)

During the fall training in September, the group spent two days at a forest camp near Seeley Lake. Activities included a visit to an active logging site, a tour of a lumber mill, a panel discussion with a variety of forest stakeholders and Bitterroot Salish story

telling around a campfire. The Bitterroot Salish are one of the American Indian groups who traditionally lived in what is now western Montana. The next day brought sessions about nature journaling with students, water monitoring by canoe, a presentation by another FFEC graduate about her FFEC service learning project and time for teachers to share a lesson from the place-based education curriculum each of them was creating.

In January, the group spent two days at Lubrecht Experimental Forest, the University of Montana's research forest. Topics included snowshoeing, animal adaptations to winter, snow science experiments, a discussion about taking students outside in winter and a musical session with a local singer-songwriter. At this final workshop, teachers turned in all of their assignments and celebrated their graduation from the FFEC program.

Data collection tools were designed to answer four research questions (Table 1). Four weeks prior to the first workshop, participants were mailed a packet of information, which included A Forest For Every Classroom Pre Survey that they were asked to fill out (Appendix A). This survey contained 19 questions in which respondents were asked to circle the response that best fit with their current teaching methods. The final question on the survey was an open-ended question that asked respondents to share any comments that they had. Twenty teachers filled out and returned the pre survey. At the final workshop in January, participants filled out A Forest For Every Classroom Post Survey (Appendix B). Fourteen teachers filled out the post survey.

To analyze the data, the columns were assigned numbers from zero to four from left to right. The percentage of teachers giving the same response to each question on the pre survey was calculated. The same was done with the responses from the post survey.

The responses from the pre survey were then compared to the responses from the post survey to assess changes in the participants' teaching styles and knowledge of place-based education that may have been due to their participation in FFEC.

During February and March 2013, FFEC graduates were asked to participate in interviews either in person, by phone or by email. Fourteen teachers were interviewed including one in-person interview, five phone interviews and eight email interviews. A colleague from the FFEC steering committee conducted two of the interviews. All participants were asked the same nine open-ended A Forest For Every Classroom Post Program Interview Questions (Appendix C). Interview responses were used in conjunction with data gathered from the pre and post surveys to give detail to the reasons that participants' teaching practices and place-based knowledge may have changed or stayed the same.

Table 1
Data Triangulation Matrix

Research Questions	Data Source 1	Data Source 2	Data Source 3
1. How does participating in FFEC affect teachers' knowledge of their local environment?	Pre Survey	Post Survey	Post Interviews
2. How does participating in FFEC affect the frequency with which teachers incorporate information about their local environment into their teaching?	Pre Survey	Post Survey	Post Interviews
3. How does participating in FFEC affect the number of classes teachers conduct in their school yard, community and the surrounding natural places?	Pre Survey	Post Survey	Post Interviews
4. How does participating in FFEC affect the frequency with which teachers engage community members to work with their students?	Pre Survey	Post Survey	Post Interviews

DATA AND ANALYSIS

The results of the Forest For Every Classroom Pre Survey compared to the results of the Forest For Every Classroom Post Survey revealed a 37% increase in the number of teachers who take their students into the school-yard for part of their learning experience 11 or more days per year from 40% on the pre survey ($N = 20$) to 77% on the post survey ($N = 14$) (Figure 2). One teacher commented, “We go outside much more than before and when we go outside it is with a much stronger learning outcome.” Another teacher echoed, “I have always tried to get out with my students, mostly because I find the classroom terribly confining. Now I have practice and activities to use to get outside and tie environmental learning to grade four curriculum.” A third teacher said,

I have always believed that students learn better when surrounded by the very thing they are learning about. However, the program has given me an ‘excuse’ to take them out more because it, after all, is a learning experience for them as well as myself. I have also received a lot of input from a variety of teachers on problems/solutions faced when taking students outside, which helps in planning/preparation.

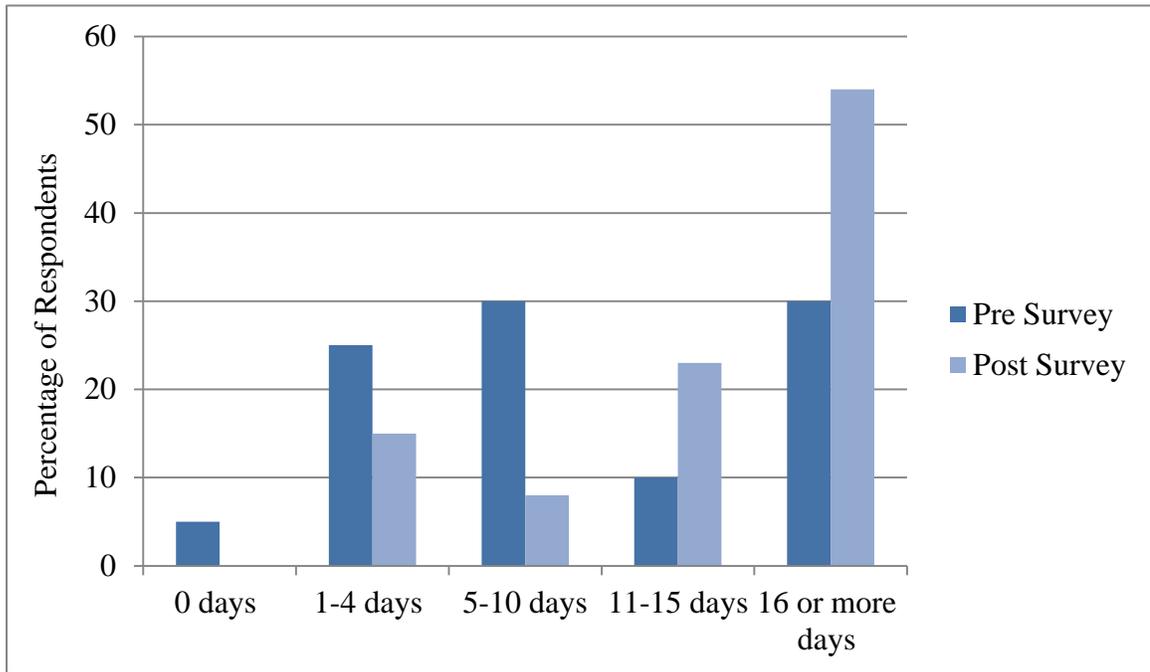


Figure 2. Full or partial days of lessons taught in the school yard per year, Pre Survey ($N = 20$), Post Survey ($N = 13$).

The results also indicated a 46% increase in the number of teachers who take their students into the community for part of their learning experience five or more days per school year from 40% on the pre survey to 86% on the post survey (Figure 3). One teacher said, “I started to take my class into the community and outside for small projects and lessons. FFEC has given me ideas for bigger scale projects and more tools for planning and organizing my lessons and projects.” Another teacher stated, “I love going into the community now. The number of resources we have within walking distance is tremendous, and we have taken more field trips.” A third teacher’s comments focused on the difficulties of getting her students out into the community. She said, “Participation in FFEC increases my motivation to get students outdoors and into their community and paradoxically my frustration because of the logistics of making it happen.” She mentioned the confines of the curriculum and transportation as limitations that keep her from getting her students into the community.

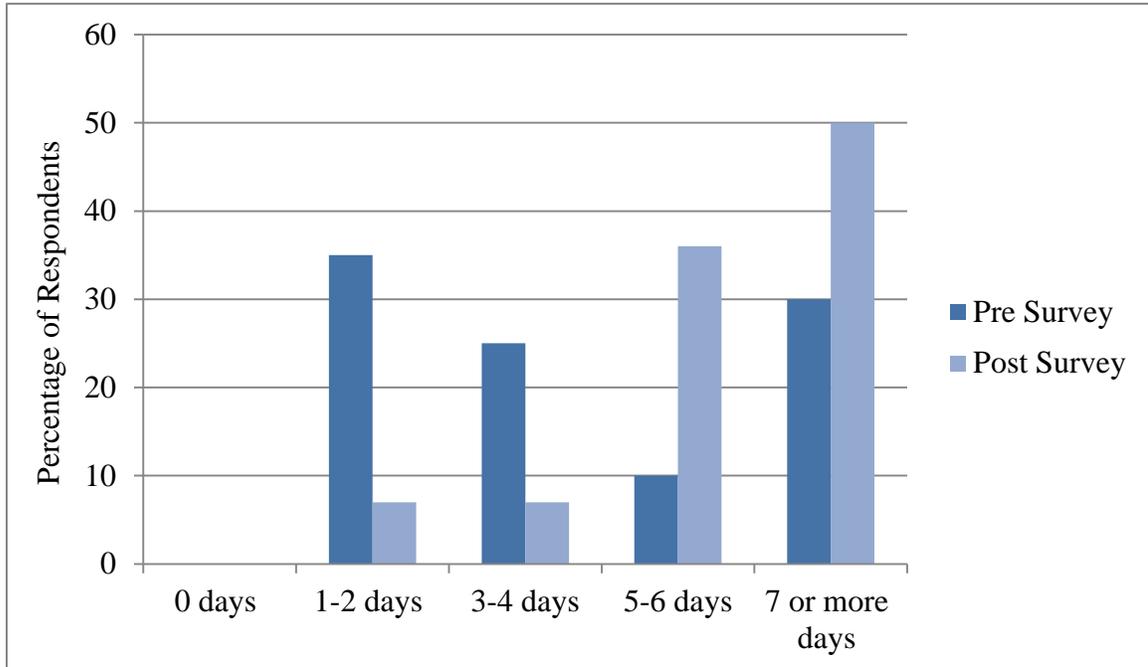


Figure 3. Full or partial days of lessons taught in the community per year, Pre Survey ($N = 20$), Post Survey ($N = 14$).

The pre and post survey data showed a 25% increase in the number of teachers who take their students into the natural environment for part of their learning experience seven or more days per school year from 32% on the pre survey to 57% on the post survey (Figure 4). “We were able to take a little bit more walking field trips of our community but also get out into the woods. Not just going to the river like I always do. Much more getting outside and journaling outside,” one teacher stated. “Just being involved in an endeavor that sprang from a belief that we should be outside inspired me to look for any possible reason to take students out,” commented another teacher. A third teacher stated, “I feel more confident in taking students outdoors.”

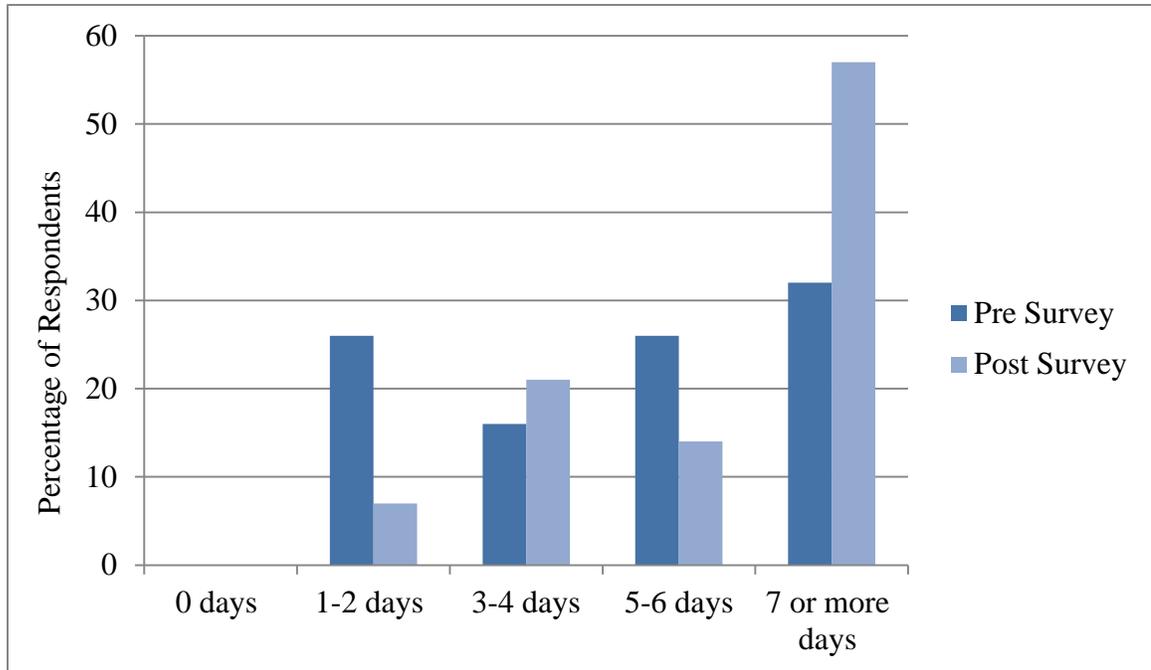


Figure 4. Full or partial days of lessons taught in the natural environment per year, Pre Survey ($N = 19$), Post Survey ($N = 14$).

On the pre and post surveys, teachers were asked about their level of knowledge about the natural, historical, and economic activities of their place. From the pre survey to the post survey, there was a 26% increase in the number of respondents who said they had a *better than average* or *high* level of knowledge of the natural world in their place from 60% on the pre survey to 86% on the post survey (Figure 5). One teacher stated, “What was mostly new learning for me were the field trips that had to do with natural resources and the timber industry.” Another teacher commented, “I have slowed down to look more carefully at the plant life in our valley. Plants that I used to sort of know are now friends that I expect to see when I am out. I notice changes in them and anticipate what the seasons will bring next.” A third teacher said, “I was either introduced to or reminded of several ecological connections that are outside my field. It definitely increased my understanding of and connection to our place.” One teacher commented

about how this new knowledge affected her confidence, “I do have a lot more confidence in teaching the science subject area for students in special education.”

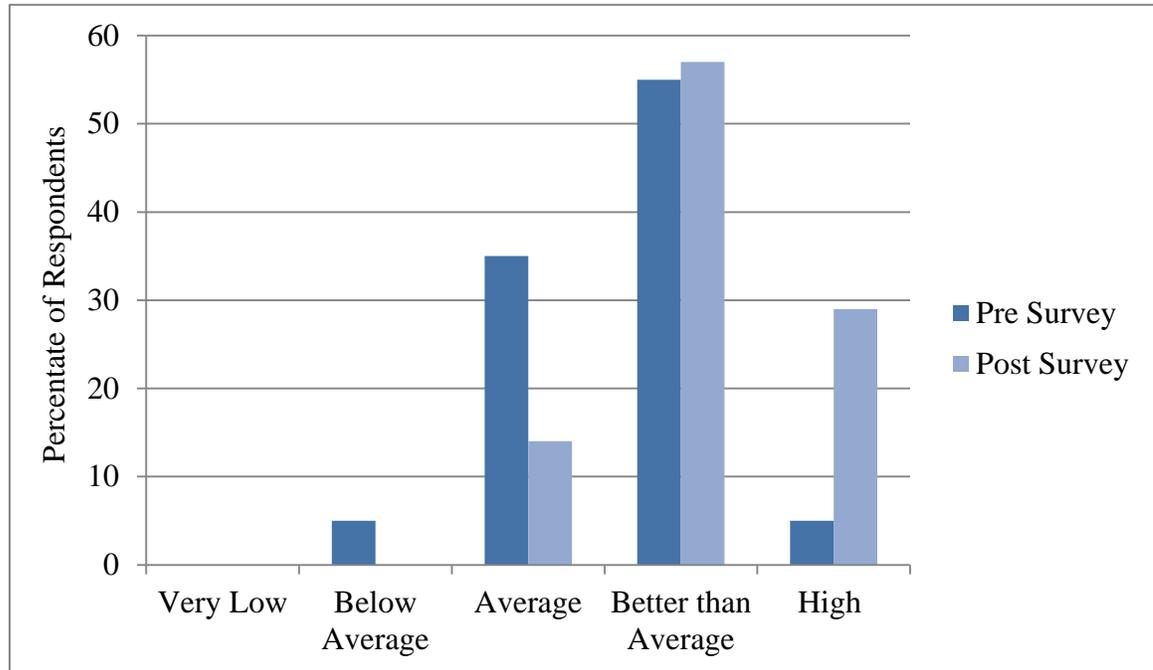


Figure 5. Level of knowledge of the natural world in our place, Pre Survey ($N = 20$), Post Survey ($N = 14$).

The data revealed a 23% increase in the number of teachers who felt their knowledge about the history of their place was *better than average* or *high* from 55% on the pre survey to 78% on the post survey (Figure 6). “Cultural and physical history of a place is really important,” said one teacher. Another stated, “I learned more information about my local area and environment and it caused me to be more interested in learning the details of our local area and history.”

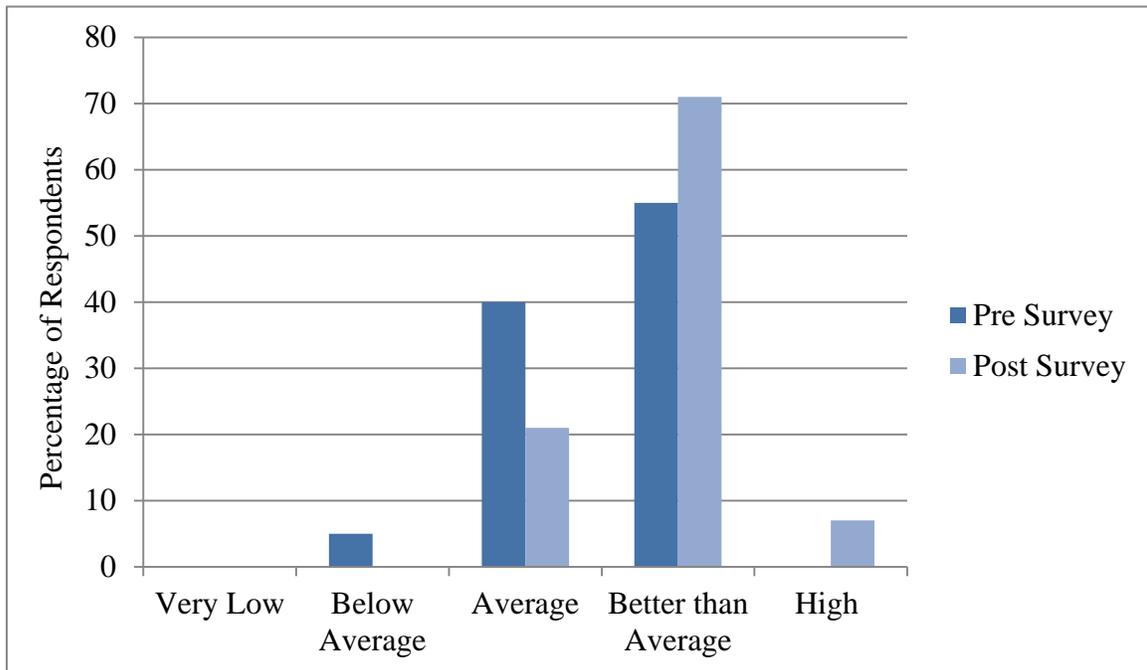


Figure 6. Level of knowledge of the history of our place, Pre Survey ($N = 20$), Post Survey ($N = 14$).

The data showed a 27% increase in those who thought their knowledge of economic activities in their place was *better than average* from 30% on the pre survey to 57% on the post survey (Figure 7). One teacher stated,

I was really intrigued by the stuff in the Blackfoot and going up to Seeley Lake and going into the lumber mill, seeing the logging operation. All of those places I would have never thought to go. It was nice to meet with the stakeholders in some of those situations where there is more than one side to the story in terms of resource management.

Another teacher said, “I feel like I am now much more aware of not just the areas but the business and livelihood of the individuals living in the environment.” A third teacher commented in general about how the program increased her knowledge, “The experts you brought to the class, and the experts in the class itself, both instructors and students,

opened up my knowledge base even wider, and made me realize there is so much more to learn out there.”

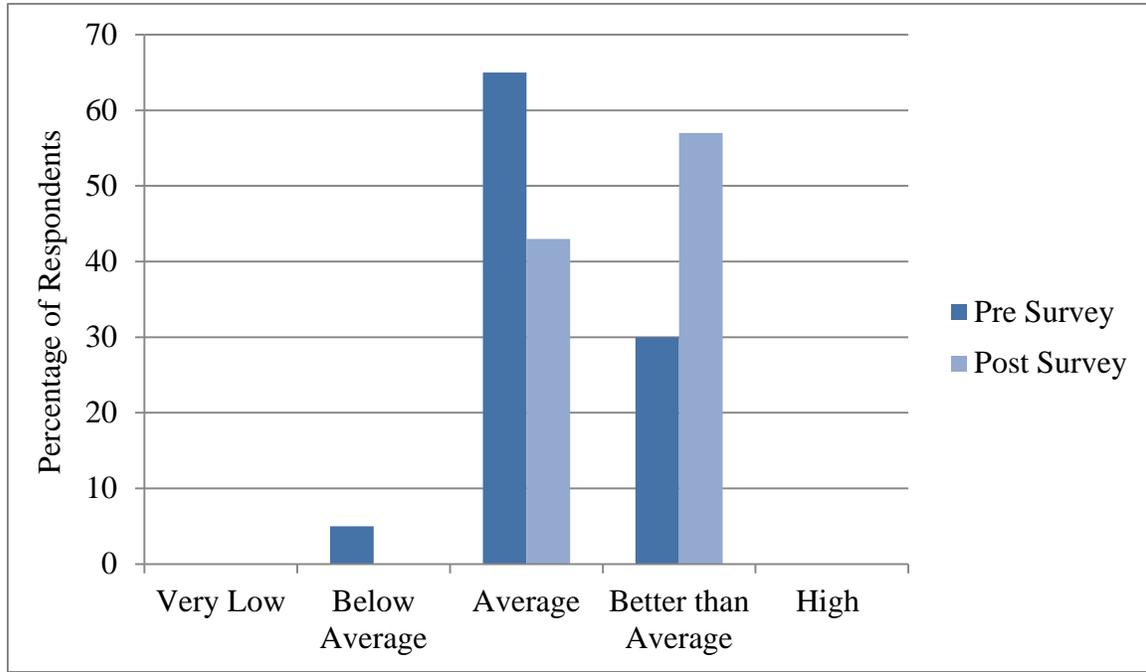


Figure 7. Level of knowledge of the economic activities in our place, Pre Survey ($N = 20$), Post Survey ($N = 14$).

The survey data revealed a 25% increase in the number of teachers using local themes and content to organize and present learning experience for their students *most of the time* or *all of the time* from 32% on the pre survey to 57% on the post survey (Figure 8). One teacher stated, “I have learned to use the resources that were shared with us to bring our local place into my teaching...And teaching about local trees, native plants, weeds, etc. really helps tie students to their place.” Another teacher’s response to whether FFEC had affected how she incorporated her local place into her teaching was, “I was already doing it, but it gives me new ways to do it on an expanded basis. It will grow from this point...My goal is to do 50% of my curriculum in PBE.” A third teacher said, “It allowed me to design that whole unit where I will be able to introduce students to

where their place is and how to identify key aspects of their place.” One teacher responded that she has not been able to use place-based education as much as she would like because her teaching assignment has changed. She stated, “There are still ways to tie PBE in – it’s just not as easy as before.”

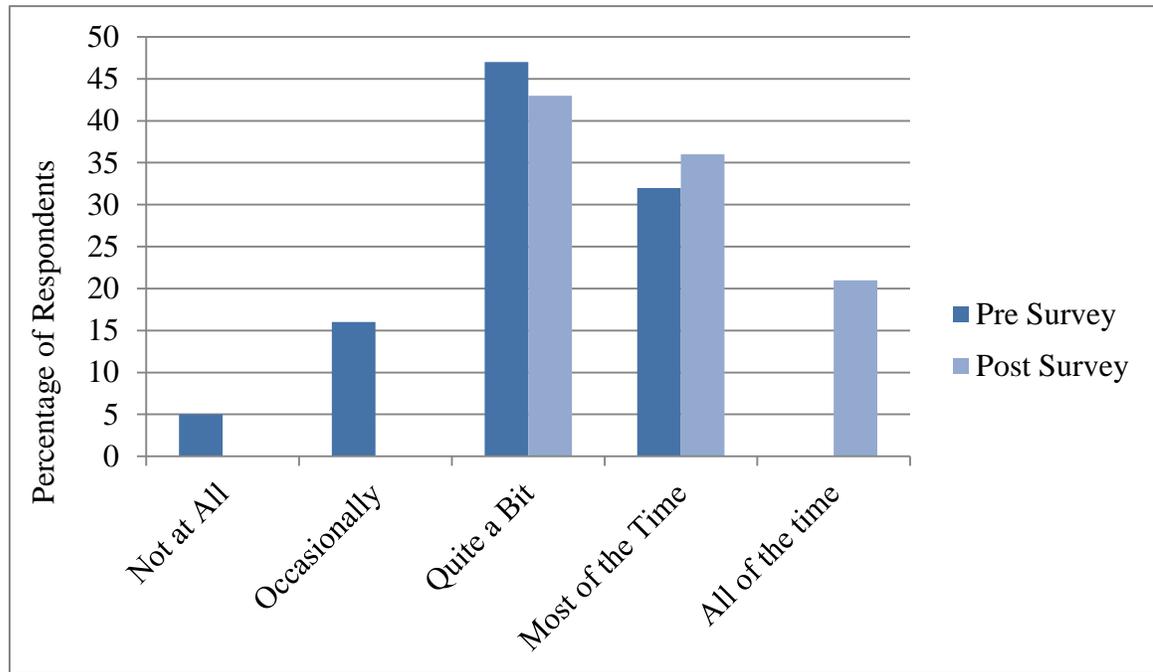


Figure 8. Use of local themes and content in organizing and presenting learning experiences, Pre Survey ($N = 19$), Post Survey ($N = 14$).

The data also showed a 42% increase in the number of teachers whose students were engaged in service learning as a result of participation in the teacher’s class *most of the time* or *all of the time* from 22% on the pre survey to 64% on the post survey (Figure 9).

Before being in FFEC I did not differentiate between service project and service-learning. Now I look for ways for my students and myself to use what we are learning to help others. I find that I can endlessly find ways for my fourth grade students to serve the younger students at our school. While these projects are

small and sometimes short-term, they build a foundation for students helping one another,

commented one teacher. Another teacher said, “I do service learning but it [FFEC] gave me one more piece to give students a voice in types of projects that they would be interested in doing. The FFEC service learning project idea will come from my students.” Another commented, “Things I have found challenging in the past when incorporating service-learning are the lack of support and resources. FFEC has done a super job of helping us to overcome these hurdles.” Another teacher stated, “I have been working with folks from the tribe and the college to put together a plan, short and longer term, for our service learning project...I think what we begin...is likely to continue and grow.” Yet another teacher said, “Through the program I was able to motivate myself and my grade level team to create a project where the kids learn about their local environment, still following the curriculum guidelines, and can give back to the community, all in one project.”

An example of a Forest For Every Classroom elementary teacher’s service learning project is a unit in which students learned how to identify several native and non-native plants followed by a noxious weed pull at a local park. A middle school social studies teacher had her students research the history of an old Forest Service Ranger Station and then students visited the ranger station to beautify the site by repairing and painting fences and trimming vegetation. Students in a high school English class read and discussed a non-fiction book about a young man whose job it was to daily remove the ice from a salmon hatchery at a site deep in the wilderness. Students then visited the site to restore the channel that served as the salmon hatchery. High school

social studies students studied challenges of world wide food distribution and then worked in their school's green house to grow food for the school cafeteria. An art teacher had her students learn about local animals so they could make life-sized sculptures of them to display at an art show in a nearby mall.

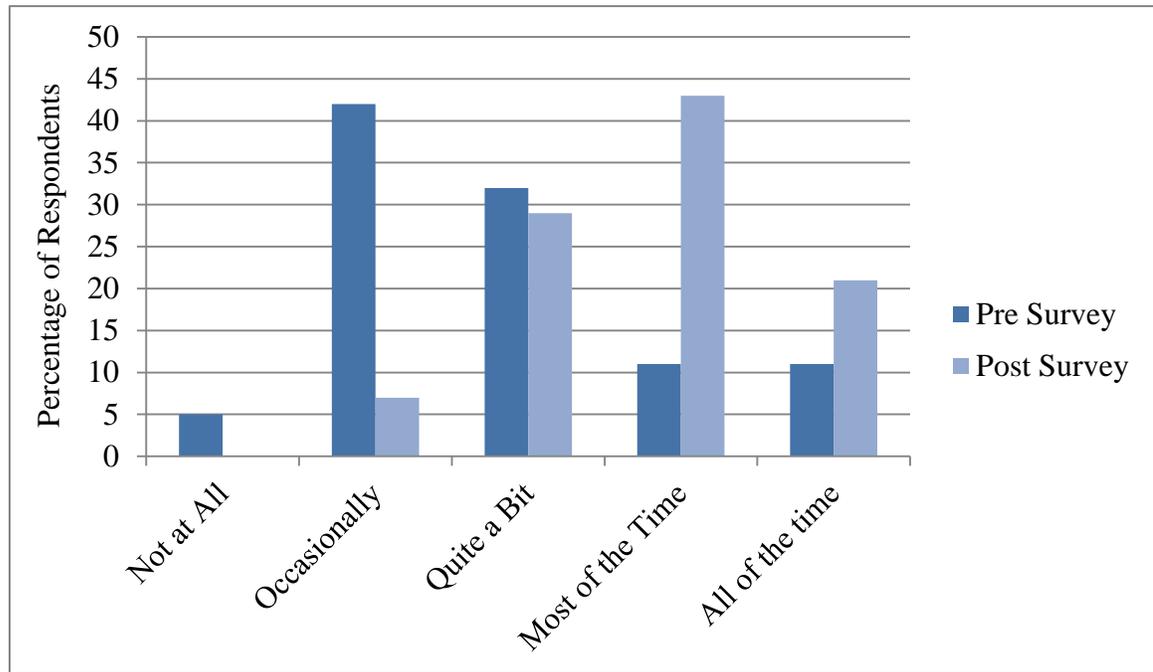


Figure 9. Frequency with which teachers involve their students in service learning, Pre Survey ($N = 19$), Post Survey ($N = 14$).

Interview responses showed that 21% of teachers felt that they needed more help in order to incorporate service learning into their teaching ($N = 14$). “This is the weakest link for me,” commented one teacher, “I do not know that I feel like I have been any more effective.” Another teacher said,

While I value the concept of service learning and its place in PBE, I am not convinced it is something that I can do with my particular group of students in an effective and worthwhile manner. I am hesitant to embark on a service learning project due to the behaviors of my students.

A third teacher said,

I think that the hardest thing for me was the service learning component. I wish there could have been more in that area that would have been helpful for me...At the end [of the workshop series] many teachers were grappling with whether their service learning project would be meaningful for students.

The survey data showed a 58% increase in the number of teachers who use an interdisciplinary approach to teaching *most of the time* or *all of the time* from 35% on the pre survey to 93% on the post survey (Figure 10). One teacher commented,

I began trying to incorporate the river system into my curriculum as a way to tie science and social studies as one. I was never successful because I never took the time. FFEC forced me to take the time and gave me materials and more importantly experts to help with the process. I am not done yet but I have a great start on a unit that ties Montana history with our science.

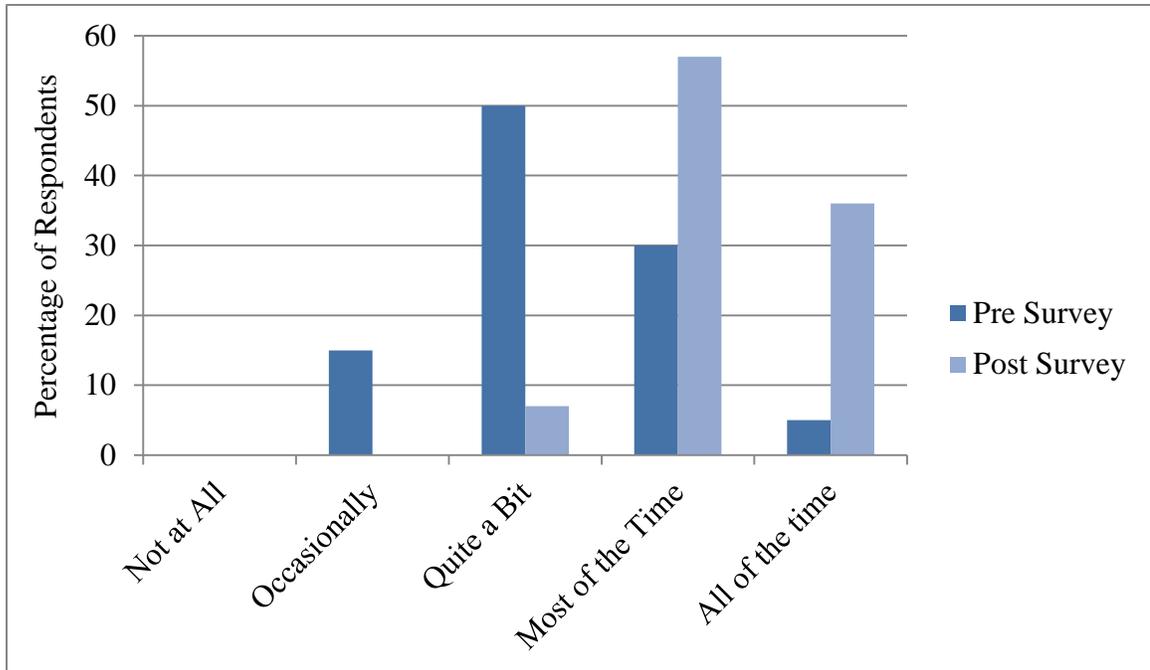


Figure 10. Frequency with which teachers use an interdisciplinary approach to teaching, Pre Survey ($N = 20$), Post Survey ($N = 14$).

In their interview responses, 100% of teachers mentioned that building relationships was an important part of their involvement in FFEC. Ninety three percent specifically mentioned both the importance of their relationships with the other teachers and the connections they made with the presenters or FFEC leadership team. One teacher said that what was most valuable to her was,

The camaraderie with other teachers, because the place I teach is not particularly interested in PBE or expeditionary learning, and the FFEC teachers and I had more in common in terms of how we wanted to deliver these lessons to our students.

Another teacher stated,

The opportunity to talk to teachers has been exhilarating. Having overnights allows this to happen because there is down time. Sometimes the best moments are in those informal times when you are developing trust and camaraderie. The

same is true of the leadership team when you allow time when you are not presenting and you are forming more of a relationship that is based on respect or trust or friendship.

Another teacher commented, “Networking with all of the professionals was super valuable. The people you have included in the network are amazing, and they are so willing to help us out!” What was most valuable to another teacher was, “Getting to share with other professionals. Just making those connections with people from the natural resources who you didn’t know beforehand and didn’t know what they do.”

Another teacher commented, “I appreciated being with a large group of intelligent people who are passionate about increasing students’ understanding of and appreciation for human-environment interactions in their immediate area.” When asked if anything surprised her about how her experiences in FFEC affected her, one teacher said, “I was blown away by the quality of the teaching team. I have been to a boatload of professional development and I have never had such committed, kind, professional instructors.”

Teachers were asked if their participation in FFEC had influenced how they involve community members in their teaching. In response to the survey item that stated, *I provide learning experiences that are supported by and facilitate strong community partnerships*, there was a 27% increase from the pre to the post survey in the number of teachers who said they did this *most of the time* from 16% on the pre survey to 43% on the post survey (Figure 11). One teacher said, “When we studied mammals and their adaptations I had a wonderful resource at the UM Zoology department through your class.” Another teacher stated, “I have definitely gained more information about community and professional contacts and resources available in the community. I know

more about who I could contact for specific needs.” When asked if her participation in FFEC had affected how prepared she felt to contact community professionals and invite them to be involved in her students’ learning, one teacher responded, “Yes, I have really increased this! I have asked parents to present on science topics in which they are noted experts, contacted FFEC resource experts to come in and share their expertise and lined up a few extra field trips.” Another teacher mentioned that she has called upon community members to help her and her students implement their service learning project, “It has been fun to work with parents of former students and some former students themselves.” Another teacher felt that the impact was more on learning who to contact rather than on changing her comfort level, “FFEC doesn’t change how comfortable I feel because I already felt prepared to contact community professionals. FFEC does give me a lot more people to contact.” Another teacher said,

Being a semi-new teacher, I have always waited for community members to take the initiative to make contact if they were willing to help support students’ learning. I feel better about making contact first now, and better prepared to ask for help.

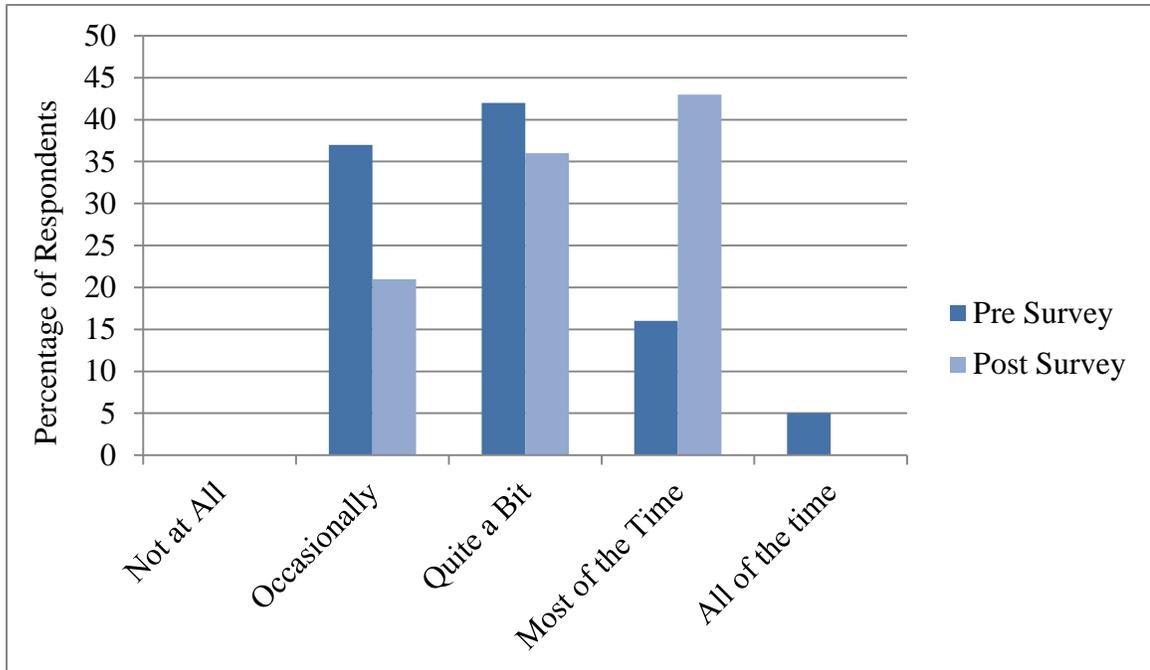


Figure 11. Frequency with which learning experiences are supported by and facilitate strong community partnerships, Pre Survey ($N = 19$), Post Survey ($N = 14$).

When interviewed, 93% of the respondents mentioned the program assignments as being the most challenging part of the program. Fifty percent of those interviewed mentioned one of the specific assignments: the tree book, the place-based curriculum or the journaling. Twenty-nine percent mentioned the difficulty of finding the time to complete assignments or staying on schedule to finish the assignments. One teacher stated, “Honestly, for me the most challenging part about participating in FFEC was making myself stay on a set schedule when completing assignments.” Another found the most challenging part to be, “Finishing the curriculum in the allotted time to the level of quality I wanted.” Fourteen percent mentioned difficulty finding the motivation to complete the tree book as the topic of trees did not relate to any of the classes they taught. One of these teachers said, “It was difficult to motivate myself to complete certain tasks that are difficult to relate to my classes, when there was plenty of other work to complete. For example, the plant book was, for me, superfluous.” However, for one teacher,

creating the place-based curriculum was the most valuable part of the program. She said, “As much as I hate to admit it, it [the most valuable part] was writing all of the lesson plans...It is a lot of work but it is worthwhile. I feel that I got a lot out of it.” The outlier, who made up 7% of those interviewed, said that leaving her students and creating lesson plans for when she missed school due to the workshops was the most challenging part of her involvement in FFEC.

INTERPRETATION AND CONCLUSION

The results of this study provide evidence that participation in A Forest For Every Classroom (FFEC) had many positive effects on participants. As a result of participating in this year-long professional development program, teachers began to facilitate more lessons on the school grounds, in the community and in the natural environment. Their level of knowledge of the natural world, local history and local economic activities increased. Teachers more often used local themes and content to organize their teaching, used an interdisciplinary approach to teaching and involved community members in their teaching. Teachers engaged their students in service learning more often, but triangulation of the data showed that FFEC could be more helpful with this. Overall, teachers increased their use of PBE after participating in the FFEC program.

The interview data showed that teachers saw building relationships as the most valuable part of the program and that they found the curriculum, tree book and journal assignments to be the most challenging part of the program. The data showed that teachers found a lot of value in the relationships they made with other teachers and with the program presenters. Though teachers cited the assignments as the most difficult part

of the program, putting in the work to create a well-designed curriculum was also mentioned as a worthwhile part of the program. One teacher who said the curriculum unit was the most challenging part for her also stated, “My curriculum ended up being such a fun unit that I will definitely teach again. The fact that I needed to complete a curriculum made me go deeper.” Another teacher stated, “I think it was a very fulfilling experience. I know people complained about the work load but it was rewarding and I am happy that more teachers from my school will participate next year.” These comments tie into research supporting that teachers will more likely persist with implementing new instructional strategies to which they have dedicated time and effort because going through this struggle helps them integrate the new concepts and approaches into their teaching methods (Winther, 2005 in Ernst, 2007). The survey and interview results suggest that participants had increased their use of all nine of the FFEC Core Attributes of Place Based Education as a result of their participation in the program (Table 2).

Table 2
A Forest For Every Classroom's Core Attributes of Place Based Education

1. Learning takes place on site in the schoolyard and in the local community and environment.
 2. Learning focuses on local themes and content.
 3. Learning is interdisciplinary.
 4. Learning helps students feel a part of and not apart from the natural world.
 5. Learning is building habits that are transferrable from place to place.
 6. Learning is personally relevant to the learner.
 7. Learning is developmentally appropriate.
 8. Learning experiences contribute to community vitality and environmental quality.
 9. Learning is supported by and facilitates strong community partnerships.
-

Teachers' comments from the post survey speak to the transformative effect the program had on them. One teacher wrote, "Taking my students outside and connecting them to their place is integral in my curriculum now. I believe it will be even more next year. My confidence with being outside has grown significantly." Another wrote, "I value opportunities for place-based learning. My best teaching days are my field trip days where I can impress upon students the riches and resources in their myriad forms that are hidden in plain sight."

VALUE

The results of the study can be used to suggest changes to improve future replications of A Forest For Every Classroom (FFEC) in Montana and possibly in other parts of the country where it might be implemented in the future. An overall recommendation is to keep most of the program the same because it proved to be very successful in effecting positive change in participants' place-based knowledge and teaching practices. One suggested adjustment to the program is to include a small amount of structured time at each workshop for teachers to discuss the journaling assignments they have completed for that workshop. This could be a twenty-minute block of time after breakfast or in the evening that could give teachers time to begin discussions they could choose to continue during unscheduled times throughout the rest of the workshop. If there was a choice of more than one journal prompt to answer, the group could be divided in two for the discussion based on the prompt they had chosen to write about. One teacher mentioned, "It would have been great to sit and discuss journal topics – writing in the journals was just for us, I understand, but teachers are hungry for time communicating with other teachers."

Another suggestion is to include more sessions when teachers are learning from other teachers. These sessions could be led by teachers on the steering committee, current FFEC participants or FFEC graduates. One teacher commented, "I would have liked to have more teachers share how they do place-based education on a day-to-day basis." A few participants commented that they felt they could use more help with developing a meaningful service learning project for their students. Information about designing service learning projects was introduced at the spring session, but more follow-

up could be done on this topic during the summer sessions. A possible remedy would be to add a time to the first summer session for teachers to discuss successes and challenges they have had with past service learning projects. Through this activity, teachers could learn from the varied experiences of their peers. Teachers would then know who in the group had experience implementing service learning lessons and activities which teachers to call with future questions. One teacher suggested, “Each teacher’s idea for the service learning project should come first and drive everything else in their curriculum. This would make FFEC better.”

I would suggest that field experiences during future replications of this program be kept just as varied as they were this year. Teachers appreciated the new experiences and enjoyed visiting the variety of field sites. “I valued the opportunity to explore our local area in ways that I wouldn’t have done on my own,” stated one teacher. Another said, “The field trips were so varied. We were able to see and do things that normally we wouldn’t be able to do.”

Something to study further would be to what extent teachers are implementing the FFEC Core Attributes of Place Based Education and using the place-based curriculum they created a year after they graduate from the program. This could be investigated by asking teachers to fill out the same post survey a year after their graduation from the program and by also conducting additional interviews at this time. I could also visit teachers at their schools and observe some of their lessons in order to assess if and how they are using place-based education in their teaching. It would also be interesting to find out if the increase in interdisciplinary teaching was only among primary school teachers or if teachers of all grade levels were working to increase their interdisciplinary teaching.

Developing and implementing this capstone project also affected my teaching practices and goals. I was able to learn more about my place during the program because I participated in many of the activities with the teachers. Through conducting the literature review, I learned a lot about the benefits and challenges of teaching using place-based education methods. In my future teaching, I think I will be more likely to design and implement place-based learning programs that address the FFEC core attributes of PBE. Already in the field trips I organized for middle school students the spring after I completed this research, most of the schools walked to their field trip sites instead of bussing as in past years. This is a result of a lack of funding for buses as well as my newfound place-based knowledge helping me to see the value of field trips to places that students can walk to. With a site that students can walk to, they will be more likely to return more often as a class or on their own. The topics of these spring field trips were also place-based and involved service learning, but not any more so than in past years. Conducting this capstone project also taught me the value of sharing results from educational research data collection with all of the involved members. I shared the data I collected with the FFEC steering committee for them to use as they planned the next year of FFEC workshops. I also shared a summary of the results with the FFEC participants so they could see how the surveys they filled out and the interview questions they answered were used to assess the program.

It was fulfilling for me to be a part of the FFEC steering committee. I enjoyed interacting with a wider variety of people than I usually work with to implement a program that will reach hundreds of students through the place-based lessons implemented by their teachers. I also learned a lot from the participating teachers and

found their energy for teaching to be contagious. I was inspired by the day-to-day work that the teachers were doing to improve the lives of their students.

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APPENDICES

APPENDIX A

A FOREST FOR EVERY CLASSROOM PRE SURVEY

A Forest for Every Classroom – Pre Survey

Description: This evaluation is to be completed by educators at the beginning of a one-year FFEC professional development cycle. We will use your responses to assess the effectiveness of the program. Your participation is voluntary. You can choose to not answer any question that you do not want to answer, and you can stop at anytime. Your participation or non-participation will not affect your credits or standing in FFEC.

Instructions: Please do not put your name on this survey. For each statement, choose where your teaching actions currently are.

Please circle your answer:

	Days (part to full) per school year				
1. I take my students into the school yard for part of their learning experience.	0	1-4	5-10	11-15	16 or more
2. I take my students into the community for part of their learning experience.	0	1-2	3-4	5-6	7 or more
3. I take my students into the natural environment for part of their learning experience.	0	1-2	3-4	5-6	7 or more

Please circle your answer:

	Not at all 0	Occasion -ally 1	Quite a bit 2	Most of the time 3	All of the time 4
4. I use local themes and content as a way of organizing and presenting learning experiences for my students.	0	1	2	3	4
5. I use an interdisciplinary approach to teaching.	0	1	2	3	4
6. The learning experiences I facilitate help my students feel <i>part of not apart from the natural world</i> .	0	1	2	3	4
7. The learning experiences I facilitate build transferrable habits related to learning about our place.	0	1	2	3	4
8. I facilitate learning experiences that are personally relevant to my students.	0	1	2	3	4
9. I make learning experiences developmentally appropriate.	0	1	2	3	4
10. I facilitate learning experiences that contribute to our community's vitality.	0	1	2	3	4
11. I facilitate learning experiences that contribute to the environmental quality of our place.	0	1	2	3	4

	Not at all 0	Occasion -ally 1	Quite a bit 2	Most of the time 3	All of the time 4
12. I provide learning experiences that are supported by and facilitate strong community partnerships.	0	1	2	3	4
13. As a result of participating in my class, students are involved in service-learning in our place.	0	1	2	3	4

Circle the words that best fill the blanks and describe you:

14. I have a _____ level of knowledge of the natural world in our place.	0 very low	1 below average	2 average	3 better than average	4 high
15. I have a _____ level of knowledge of the history of our place.	0 very low	1 below average	2 average	3 better than average	4 high
16. I have a _____ level of knowledge of the economic activities in our place.	0 very low	1 below average	2 average	3 better than average	4 high

Please circle your answer.

	0 never	1 rarely	2 sometimes	3 quite often	4 most of the time
17. I apply the principles of place-based education with my students.	0	1	2	3	4
18. My students are physically active during the school day.	0	1	2	3	4
19. I create and use original curriculum and materials.	0	1	2	3	4

20. Please share any additional comments that you have:

Thank you for taking time to complete this survey! The information we receive will help as future FFEC programs are designed and facilitated. Please either bring your completed form with you on April 27th or send it to:

Montana Natural History Center
Attn. FFEC Evaluation
120 Hickory St
Missoula, MT 59801

APPENDIX B

A FOREST FOR EVERY CLASSROOM POST SURVEY

A Forest for Every Classroom – Post Survey

Description: This evaluation is to be completed by educators at the end of a one-year FFEC professional development cycle. We will use your responses to assess the effectiveness of the program. Your participation is voluntary. You can choose to not answer any question that you do not want to answer, and you can stop at anytime. Your participation or non-participation will not affect your credits or standing in FFEC.

Instructions: Please do not put your name on this survey. For each statement, choose where your teaching actions currently are.

Please circle your answer:

	Days (part to full) per school year				
1. I take my students into the school yard for part of their learning experience.	0	1-4	5-10	11-15	16 or more
2. I take my students into the community for part of their learning experience.	0	1-2	3-4	5-6	7 or more
3. I take my students into the natural environment for part of their learning experience.	0	1-2	3-4	5-6	7 or more

Please circle your answer:

	Not at all 0	Occasion -ally 1	Quite a bit 2	Most of the time 3	All of the time 4
4. I use local themes and content as a way of organizing and presenting learning experiences for my students.	0	1	2	3	4
5. I use an interdisciplinary approach to teaching.	0	1	2	3	4
6. The learning experiences I facilitate help my students feel <i>part of not apart from the natural world</i> .	0	1	2	3	4
7. The learning experiences I facilitate build transferrable habits related to learning about our place.	0	1	2	3	4
8. I facilitate learning experiences that are personally relevant to my students.	0	1	2	3	4
9. I make learning experiences developmentally appropriate.	0	1	2	3	4
10. I facilitate learning experiences that contribute to our community's vitality.	0	1	2	3	4
11. I facilitate learning experiences that contribute to the environmental quality of our place.	0	1	2	3	4

	Not at all 0	Occasion -ally 1	Quite a bit 2	Most of the time 3	All of the time 4
12. I provide learning experiences that are supported by and facilitate strong community partnerships.	0	1	2	3	4
13. As a result of participating in my class, students are involved in service-learning in our place.	0	1	2	3	4

Circle the words that best fill the blanks and describe you:

14. I have a _____ level of knowledge of the natural world in our place.	0 very low	1 below average	2 average	3 better than average	4 high
15. I have a _____ level of knowledge of the history of our place.	0 very low	1 below average	2 average	3 better than average	4 high
16. I have a _____ level of knowledge of the economic activities in our place.	0 very low	1 below average	2 average	3 better than average	4 high

Please circle your answer.

	0 never	1 rarely	2 sometimes	3 quite often	4 most of the time
17. I apply the principles of place-based education with my students.	0	1	2	3	4
18. My students are physically active during the school day.	0	1	2	3	4
19. I create and use original curriculum and materials.	0	1	2	3	4

20. Please share any additional comments that you have:

Thank you for taking time to complete this survey! The information we receive will help as future FFEC programs are designed and facilitated.

APPENDIX C

A FOREST FOR EVERY CLASSROOM POST PROGRAM INTERVIEW

QUESTIONS

A FOREST FOR EVERY CLASSROOM – POST PROGRAM INTERVIEW
QUESTIONS

Description: Teachers will be asked these questions at the end of a one-year FFEC professional development cycle. Their responses will be used to assess the effectiveness of the program. Prior to the interview, teachers will be told their participation is voluntary. They can choose to not answer any question that they do not want to answer, and they can stop at anytime. Their participation or non-participation will not affect their credits or standing in FFEC.

1. How did being involved in FFEC affect your knowledge about your local environment?
2. Has participating in FFEC affected how you incorporate your local place into your teaching? Please explain.
3. Has participating in FFEC affected how you incorporate service-learning into your teaching? Please explain.
4. Did participating in FFEC affect how often you take you students outdoors or into their community for lessons or projects? Please explain.
5. Has your participation in FFEC affected how prepared you feel to contact community professionals and invite them to be involved in your students' learning? If so, how?
6. What was most valuable for you about participating in FFEC?
7. What was most challenging about participating in FFEC?
8. Did anything surprise you about how your experiences in FFEC affected you or your teaching?
9. Is there anything else you would like me to know?