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## Imagination Enviro-Station: Students Connecting Students to Ecological Sustainability

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**IMAGINATION ENVIRO-STATION: STUDENTS CONNECTING  
STUDENTS TO ECOLOGICAL SUSTAINABILITY\***

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ABSTRACT

The development of an environmental identity is viewed by many as essential if we are to reorganize our societies toward ecological sustainability (Bell 2009; Clayton and Opatow 2003; Thomashow 2002). That, along with an eye toward environmental justice, was the major impetus for our graduate seminar in applied environmental sociology to partner with an elementary school in our small city of Hammond, LA, during the spring semester of 2010. After conducting focus groups with a group of fourth to sixth grade students and holding decision-making discussions with them for this community-based research (CBR) project, we went about two projects – planting native, “water loving” trees and installing rain barrels to mitigate flooding on their playground. A major goal of the project and purpose of CBR is to democratize the knowledge-making process (Strand et al. 2003). Thus, we sought to assist the students in gaining valuable skills. Specifically, students learned how to sustainably remedy their school’s drainage problem, enhance their outdoor space, encourage more communal interaction, and develop more of an ecological identity (Thomashow 2002). We also hoped to plant the seeds of future career possibilities that would benefit their communities. This paper traces the development and learning outcomes of this CBR project focused on environmental identity.

Could we all learn about environmental sustainability? This question was not a derivative of some utopian ideology reminiscent of the 1960s. It was the question that our graduate seminar in applied environmental sociology set out to answer. Specifically, we wanted to know if we could employ a participatory pedagogy to learn about different sustainable solutions to ecological problems and environmental justice issues while partnering with students at a local elementary school to solve a problem that they identified. In addition, through the participatory

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process, we wished to abstain from the macro-cultural schema of environmentalism as volunteerism or, expressed another way, conservation as a type of extracurricular activity. Thankfully and appropriately so, today young people do learn about environmental issues, but they are often presented as normal consumption activities that must cease (pollution from the burning of fossil fuels, for example). In these instances, children have little power to make significant changes, while actions they can take, like recycling or conserving energy, provide little tangible benefit and are too often framed as “giving something up” (Clayton and Opotow 2003).

Instead, our aim was to assist the elementary students in establishing an ecological or environmental identity linked to the possibility of economic opportunity through self and community enhancement. For example, by planting water absorbent trees and installing rain barrels to mitigate playground flooding instead of engineering more drainage infrastructure, we hoped to seed the idea that this skill could be turned into career opportunities that benefitted them and their communities. Thus, we hoped to achieve various learning outcomes. This article outlines that endeavor, named the Imagination Enviro-station Project, as well as the development and learning outcomes for both the elementary students and us - six sociology graduate students and a faculty member. We conclude with a discussion of implications and recommendations for future community-based research (CBR).

## LITERATURE REVIEW

Environmental education programs in elementary and secondary schools have seen great growth over the past two decades. Most employ these programs with the knowledge that children, especially those in elementary school, are at a stage in childhood critical to identity formation (Ballantyne, Fien, and Packer 2001; Thomashow 2002; Woollorton 2004). The development of identity can be seen as a process by which we organize information about ourselves. As Mead (1934) noted, the individual self arises out of social experience; it is based on interpretations of those experiences, including reactions and feedback from others. The self then produces more fixed ideas about itself, which is what we call identity. Importantly, the self is continually evolving as it engages the social world.

In fact, even physical places, built and/or natural, are imbued with various forms of social meaning that are often incorporated into identity (Burley 2010; Burley, Jenkins, Laska and Davis 2007). For example, someone may identify as a New Yorker or with the landscape in Yosemite National Park based on experiences within those places. In turn, meaningful experiences with these places carry their

own sociocultural meanings, which are interpreted by the individual and, in various ways, incorporated into identity. Thus, since broad environmental concern continues to grow and identification with place can motivate action, educators and scholars alike have theorized about the importance of linking children's "thoughts about nature to the development of a coherent self-image, creating an ecologically grounded identity" (Thomashow 2002:260).

Consequently, many scholars and educators agree that childhood, the time of greatest development, is an important period during which to introduce ideas of environmental stewardship (Ballantyne et al. 2001). Analyzing two school environmental education programs, Ballantyne et al. (2001:23) noted that "experiences such as planting trees, cleaning creeks, collecting information, and taking positive action in the local environment" led to students reporting that they had "learned new information, skills, attitudes and approaches to environmental problems." Ballantyne and colleagues (2001) also found that aspects of the programs that actively engaged students and gave them the skills and competence to solve environmental problems had the greatest success in terms of changes in participants' behavior and lasting effects on the importance that environmental issues had to them. Significantly, when these activities are positively construed by participants, they become incorporated by the self and contribute to what many, including Clayton and Opatow (2003:45-46), call a (positive) environmental identity: "a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the ways in which we perceive and act toward the world; a belief that the environment is important to us and an important part of who we are."

Environmental identity is increasingly studied in applied settings. In her research on identity, environmental psychologist Clayton (2003) suggested that many individuals connect important aspects of their identity with the natural world, whether or not the particular individual self-identifies as an environmentalist (Clayton 2003). In fact, she (2003:51) stated that "the natural environment thus seems to provide a particularly good source of self-definition, based on an identity formed through interaction with the natural world and on self-knowledge obtained in an environmental context." As many scholars who work on identity have noted, a healthy identity includes a sense of competence, autonomy, and relatedness, or a feeling of connection. Clayton (2003) argued that these elements can be more readily gained through engaging with our natural environments. It appears as no accident that ecological education programs that foster the development of these aspects of identity are often the most successful.

Embodying this sentiment is the study of ecological identity by Thomashow (2002). She noted the importance of allowing adolescents, in particular, the freedom to develop a relationship to the natural world on their own terms. In studying school-based programs that integrated ecological thinking into the educational experience, which held many CBR elements although they were not labeled as such, she found an apparent need among adolescents to engage in “wild nature” (Thomashow 2002:277). In one program, students were tasked with making decisions about the use of a parcel of public parkland in a small New England city. After months of contemplative study and observation by the students, the city decided to build a boardwalk through an area that the students thought should be set aside for restoration. The students took city officials to task at a public city council meeting, the council relented, and the land remains managed by the class. Referring to those first students, she wrote that the “self was reflected in the sanctity of this land, and it fueled their passion to protect its integrity” (2002:269).

As a popular component of environmental education, sustainability education – that which develops an awareness of how to live in the present without compromising that ability for future generations or, simply, to live without depleting natural resources – establishes a way to help students comprehend and act toward complex environmental, social, and economic issues in a way that promotes sustainable living (Higgs and McMillan 2006; Wooltorton 2004). Moreover, when sustainability is modeled by educators and other significant relations like parents and peers, sustainability education can be more effectively executed (Higgs and McMillan 2006). This is corroborated by Kals and Ittner (2003:152) who have suggested that actions and discussions with important others help to “stabilize a group identification as a foundation for an environmental identity.” This, along with the components outlined above, is an important concept to follow because, as Ballantyne and colleagues (2001) suggested, just because youth enjoy a project does not mean that they will develop an environmental identity.

An opportune place for fostering an ethic of responsibility and furthering environmental education is on school grounds. As outdoor classrooms, these areas are a dynamic resource for potential learning, which can be enhanced by unstructured exploration outside class time (Malone and Tranter 2003). Children can directly engage issues in a place with which they have familiarity, where a sense of place may already exist, where ownership and pride for a project may take hold more readily, and where results will be more tangibly evident to participants and their peers. The school playground environments that are more conducive to environmental learning are those found to be unstructured and not designed

specifically for children's play (Malone and Tranter 2003). Malone and Tranter (2003) pointed to a study by Herrington and Studtmann (1998) where children's play revolved around social hierarchies determined by physical competence in areas occupied by play structures. Conversely, after an open field was planted with various plants and shrubs, more "fantasy play and socialization developed" (Malone and Tranter 2003:8). Significantly, social hierarchies evolved that were based more on children's command of language, creativity, and their "inventiveness in imagining what the space might be" instead of physical mastery (Malone and Tranter 2003:8, citing Herrington and Studtmann 1998).

When areas of play are designed in these ways, children often have more positive and egalitarian relationships among their peers and demonstrate more creative-based play (Malone and Tranter 2003). Furthermore, type, quality, and diversity of play environments directly affect the type, quality, and diversity of play (Malone and Tranter 2003). In this way, in a naturally diverse play space, "self-knowledge obtained in an environmental context" is gained, thus setting the stage for an environmental identity to bloom (Clayton 2003:51). Additionally, when students are made cognizant of the positive aspects and greater freedom that these unstructured areas afford, environmental learning and affectation become more likely.

Besides making these types of environmental learning spaces available to children, engaging them in the actual design can be beneficial. As environmental psychologist Somner (2003) noted with tree planting, a child can identify more with a natural environment that they created and planted themselves. Add to this idea that this facilitates children viewing their school grounds more positively, which Malone and Tranter (2003) stated increases the likelihood of children feeling responsible for ongoing maintenance. In addition, an environmental identity can develop inside a sense of place. Consequently, and with adequate prompts, the possibility of children extrapolating those sentiments to the larger world is significantly enhanced.

Building on the idea of environmental identification, subsequent care, and action, Somner (2003) found that trees have a significant impact on identity in urban tree-planting programs. While he discussed the benefits of trees such as absorbing urban/suburban runoff and thereby reducing flooding, mitigating the urban heat island effect, reducing energy use when shading buildings, adding to property values, absorbing air pollutants, and enhancing community and individual self-image, he also pointed to the community-building implications of tree planting programs and to the fact that people identify more with trees they plant themselves.

Furthermore, in both self-report and psychological studies, trees and contact with greenery have been found to hold restorative value (Somner 2003). Conversely, damage to trees or natural areas that people are attached to is likely to cause damage to the self (Burley 2010). Consequently, tree planting, or similar forms of environmental action for that matter, may have the simultaneous or symbiotic effect of healing the self and the planet (Ryan and Grese 2005). Importantly, as part of participatory environmental education programs and the resulting increased awareness, environmental actions like tree planting become seen by participants as affirmative for the self and planet. This may be especially true for children, who, Somner (2003) stated, hold a special affinity for trees.

It must be noted that tree planting by itself will not produce these outcomes. Many issues, like failure to plan or allocate resources for maintenance or a lack of education or decision-making ability by residents can lead to the collapse of tree-planting programs (Austin and Kaplan 2003; Somner 2003). Thus, community goals and identity enhancement can be undermined.

Nonetheless, careful planning where participants, whether children or adults, share decision making with professionals can facilitate an ecological identity and attachment to place where an ethic of care becomes applied to a variety of other ecological and social issues. This attitude of regard and responsibility has been noticed in university-based CBR projects where participants also report the value of their real world experience, increased cognitive development, improved communication skills, and the mutual benefits to participant learning through such projects as analyzing water quality and reducing energy consumption (Keen and Baldwin 2004).

It also appears that for children, involvement at the local level, where they live, play, and learn, is an essential component to fostering an environmental identity. While traditional classroom learning or watching Hollywood nature films may help to instill ecological concern, we speculate that these are passive activities that by themselves do not provide the critical skills to critique and act at the community level. This is where CBR fits in. When children are supported by significant others and provided the freedom to analyze and develop more sustainable strategies around an issue in their community, then they are empowered (Thomashow 2002) and can identify other local issues, some of which may have previously been invisible, that they feel they can solve. This strategy can be especially useful to poor and nonwhite communities, both urban and rural, that suffer disproportionate levels of environmental damage (Bell 2009; Downey and Hawkins 2008). Allowing space for these children to extend their connections to the natural world through



enhancing a place in their community or solving an environmental problem can facilitate competence, autonomy, and a sense of connectedness; all aspects of a healthy self-concept (Clayton 2003). Furthermore, building these components of identity in an environmental context can foster the belief among children that they can solve environmental problems about which they might otherwise feel helpless to do anything (Ryan and Grese 2005; Kals and Ittner 2003). An important part of this process is allowing students a significant degree of leadership in projects, as with many of those mentioned here. Thus, it is our contention that incorporating elements of CBR should guide effective environmental education programs, which can then effect social change.

## METHODS

Methodologically, our goal was to employ CBR principles, primarily those influenced by the conflict-oriented participatory research method that came of age during the 1960s and 1970s (Strand et al. 2003). In that manner, the school with which we partnered was specifically chosen due to its context within a school district embroiled in a federal desegregation case brought by the local chapter of the National Association for the Advancement of Colored People (NAACP) for not complying with a decades-old federal court decree to desegregate (Morris 2010). Importantly, there are environmental consequences for this failure to desegregate. The drinking water in one of the district's low-income (nearly all African American) schools was found to contain dangerous amounts of lead. Although our project did not take place at that particular school, our school did share similar demographics that reflected a population that is "disadvantaged by existing social, political, or economic arrangements" (Strand et al. 2003:4). Because of these issues, Burley, the professor of the course, thought it appropriate that students from an applied graduate course in environmental sociology participate in this community to learn from the elementary students' knowledge and skills, and in turn, to assist them in some way using our knowledge base.

It was our aim to encourage the youth to contribute their own experience, wisdom, and skills to the research and to solving a problem they would identify (Strand et al. 2003). As discussed below, we met with varying levels of success. Nevertheless, Strand and his colleagues (2003) identified three principles of CBR around which we attempted to build the project. First, they stated that projects are to be collaborative efforts between researchers (professors and students) and community members, while secondly, multiple sources of knowledge are validated and promoted, particularly the knowledge of community members. Third, projects

must seek social action and social change to achieve social justice. While there is theoretical debate about the meaning and interpretation of these principles, we sought simply to employ them in a way that gives as much control as possible to the young students, while sharing practical, and yet untraditional, knowledge about environmental sustainability with them; knowledge to which they may not have had exposure and that, if they chose to pursue it in the future, could be used to further transform the circumstances in their community (Strand et al. 2003).

In CBR, community members must be intimately involved “at every stage of the research process: identifying the issue or problem, constructing research questions, developing research instruments, collecting and analyzing data, interpreting results, writing the final report, issuing recommendations, and implementing initiatives” (Strand et al. 2003:8). As is discussed below, we achieved much, but restrictions prohibited the ideal realization of these process-driven goals.

#### *Methods in Practice*

Our efforts to make environmental problem solving a participatory experience began with our semester-long partnership with the fourth, fifth, and sixth grade students at a local elementary school. After discussing the project with the school’s principal, we arranged to meet with a group of students once per week, for thirty-minute periods, during a time the school had already allocated to extracurricular club participation. By March, our time extended to forty minutes, as we could overlap with the students’ lunch period. The sixteen students we began with were chosen because of adequate academic standing (we lost two students by our third meeting due to inadequate quarterly grades). Originally, they were to be in the school’s Imagination Station, a science-based club. However, this group had not yet begun, so the principal allowed the group to work with us. The principal, along with the teacher supervising this group, believed that the students would be excited to work with university students.

Because our project was situated with students on a school campus, the contextual space within which we would be working was already designed for pedagogical purposes. Yet, by moving learning outdoors, beyond the walls of the classroom, we sought to broaden the space in which teaching and learning might occur. Drawing upon theoretical elements of critical pedagogy and CBR, we developed, in concert with the young students, a participatory learning experience that we felt would serve to make the environment educational.

During our first two sessions in early February, we conducted focus groups with the sixteen students, allowing them to voice the localized knowledge that they

possessed about their school and their experiences within it. In doing so, we sought to create an open, conversational space for the reciprocal exchange of ideas through dialogue (Freire 1970; Kincheloe 2008). Each focus group session lasted about twenty minutes with students separated into three focus groups. Each group had two university students or a faculty member, one to take notes and the other to facilitate discussion. Babbie (1999) cited the advantages of focus groups in capturing real-life social data. Likewise, focus groups encourage the generation of dialogic answers to problems or issues in a similar fashion to how people discuss these issues in “real life.” In doing so, our focus groups became a vehicle for the determination of the problems that our group could feasibly cooperate to rectify, while also including the voices of all participants in project identification and decision-making. Further, during the first focus group session we asked participants to draw their favorite places, which allowed individual students to provide contextualized representations of their identity. Similar to what Friere (1970: 102) called “generative themes,” these drawings were meant to stimulate discussion and to encourage self-expression during our first meeting. Most composed drawings that had a natural orientation.<sup>1</sup> The drawings then served as points of entry for participant determination of the project that would follow (Smith 1987). Ultimately, they identified playground flooding as an environmental problem that they would be vested in mitigating. Based upon focus group-generated dialogue, our graduate cohort convened to develop environmental interventions that would address this flooding. At our third meeting with the students, we presented potential interventions and from there we collectively decided to move forward with two environmental solutions: planting native, water-absorbent trees and installing rain barrels.

In the next six weeks, the students worked at implementing both aspects of the project, dedicating four weeks to tree planting and two to the rain barrels. We also created an online blog for ourselves to document and reflect upon this process, serve as a journal for our observations (our primary source of data collection), keep track of our tasks and activities, and provide a general forum to share ideas and progress of the project with one another (Imagination Enviro-station 2010).<sup>2</sup> Graduate students posted to the blog once per week, and we discussed their posts

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<sup>1</sup> The commonality of nature-oriented scenes may have been influenced by the purpose of our project. Upon our first meeting, we told the young students that we were there to help them implement an environmental project of their choosing.

<sup>2</sup> Ideally, the blog would have been used by the youth as well.

at our weekly class session. Then, the next session with the elementary students was planned. We met the elementary students Friday afternoons and then would report observations, progress, ideas, and concerns on our blog posts before our Monday evening graduate class meetings. In this way, we could continually reflect upon our goals.

As a final and more structured attempt at observation, we conducted brief surveys with the youth during our second to last meeting (our last meeting was a celebration of our accomplishments with ice cream and local strawberries!). The survey consisted of eight closed and open-ended questions, and was administered to the eight students who were present for the session. The surveys were meant to assess the knowledge and interest gained by the youth's involvement in the project. Due to time constraints, the interviewing was conducted when the rain barrels were being installed, which may have contributed to results that were inconsistent with our earlier observations. These findings will be discussed further in the next section.

Notwithstanding the limits of the survey and other elements of the project, the elementary students participated fully in the processes of problem identification and analysis, strategic planning and decision making, and execution and implementation of their environmental interventions. Through active participation in each of these stages, we hoped that the students would gain a sense of ownership and control over the work they had completed. Ultimately, we hoped that multistage collaborative participation in environmental problem solving would empower the students to realize their own capacity for strategic analysis and solution development. Further, we hoped they would become confident in utilizing the knowledge they possessed and recognizing the spaces for learning that lied beyond the walls of the classroom.

## IMPLEMENTATION AND FINDINGS

Because CBR is process oriented, our findings are presented in a sequential format, beginning with the focus groups we conducted at the onset and ending with the end-of-project surveys. To reiterate, we engaged students as partners and chose a feasible project to mitigate a structural problem with ecologically-sustainable solutions. We planted cypress trees in an area of the school playground where frequent flooding from rain occurred, and we installed two rain barrels at building downspouts to reduce a small portion of the rain water that contributed to that flooding.

*Focus Groups*

With a commitment to participation in mind, we began our work with the school students by holding focus groups. As stated earlier, the first focus group session entailed the youth drawing pictures of their favorite places to stimulate dialogue. After a few students presented their drawings, many students that followed incorporated their fellow students' aforementioned ideas, thus demonstrating the conversational nature of the focus groups. For example, when one participant spoke of his affection for fishing in a river, a second student agreed that fishing was enjoyable and incorporated it as an activity that could take place in the scene he had depicted. In this way, one student's depiction of an enjoyable aspect of his everyday life led to another student's declaration of circumstances that the two individuals shared.

From there, during the second session, focus group facilitators could steer the discussion to what the students liked and disliked about their outdoor campus. Flooding on the playground near the basketball courts was the problem that appeared to affect students the most, and they discussed it at length. In short, the flooding from rain impeded girls from playing "chase" and boys from playing football. After posting data gathered during the focus groups to the blog, we decided that we would propose solutions to this issue.

Expectations were high for the next session and we were at the ready with demonstrations of different projects that the students could choose from. However, due to a field trip, bad weather, and low grades for some, only five students attended this meeting. Nevertheless, presentations of rain barrels, rain gardens, a vegetable garden, and tree plantings were made. Students liked the possibility of installing a rain garden, which held the allure of a small bridge and possibly a gazebo. However, acknowledging further limits to our project due to available funding and time, we held further discussion with the students and reached the conclusion that if the rain garden could not be achieved, then planting trees and installing rain barrels were the next best things.

*Planting Sustainability and Identity*

Once the decision to plant trees and install rain barrels was made, we intensified our search for funding. We, the project facilitators, discovered that funding from grants would take too much time. However, our eventual acquisition of funds came serendipitously. As we sought education on species choices and planting techniques from a local tree foundation, we asked about available funds and were told, quite unexpectedly, there was money waiting to be used for something similar to our

purposes available through a fund used for local grants. We made a formal request and by the end of April, funds for the trees were available from the school for reimbursement. As for the rain barrels, funds were obtained through a local, private donation. Additionally, we obtained more than twenty tiny cypress, birch, and Chinese elm saplings left over from a local forestry organization's weekend auction.

Ideally, we would have liked for students to have been primary participants in these research-based activities, however, we were restricted by both the time limits of finishing the project and the students' availability; such is the gap between the goals and the reality of CBR. Nonetheless, an important element of their participation before planting came in the form of an educational tour of the playground given to us by the students. In educating us about their playground, the students became the experts. Consequently, as we asked for their opinions and discussed the best spots to plant the trees and install the rain barrels, the students took a more active role in the decision-making process. They discussed with us and among themselves the positive and negative aspects of different possibilities. This did not occur on its own. We had to be mindful to ask for their advice first while framing our thoughts and contributions as questions.

By mid-March we were planting the trees. We, the facilitators, oversaw the process and asked what we should do and how we should do it while the students did most of the planting. As Walker (2010) wrote in her blog post, "They took an active role in selecting the placement, digging holes, measuring, and securing plants in the ground." Furthermore, we used these planting sessions, which lasted for four consecutive Fridays, to educate the students about how to care for the trees without chemicals, as well as about other benefits of tree planting, beyond reducing flooding (i.e., preventing erosion, reducing air pollutants, and reducing ambient temperature during hot months). Again, Walker's (2010) blog post provides an illustration.

Q: Why is this the best spot to plant our trees?

A: This is where it floods

A: The trees will be able to soak up some of the water

Q: What benefits will the trees have on your campus?

A: Provide shade to the basketball court

A: Help with flooding

Additionally, Cuifi (2010) noted that because part of these sessions occurred during school recess, there was great interest from students outside the club, and

this “probably made our group feel a little bit of pride in the fact that they are the ones involved. Even the girls wanted to get in there and dig holes.”<sup>3</sup> She added, “Everyone wanted to help! I counted at least ten new students who were asking what we were doing and if they could help.” In fact, many students outside the Imagination Enviro-station club assisted in tree-planting.

In these passages, we see the intersection of participatory practices and environmental identity. As students educated us and made decisions, a dialogue was created where one individual’s reflection catalyzed further reflection from another participant. Meaning was continually remade through a process of mutual interaction. Throughout that process, students worked their way toward putting together the puzzle that allowed them to move from individualized experience toward community. This sense of community existed in individual perception and manifested itself as increased environmental identity. This increase in environmental identity occurred as students came to identify with the trees they planted themselves. As Somner (2003) noted, people are much more likely to identify with and take responsibility for trees that they plant themselves. For the students we worked with, this identification became more prominent as they came to know the purposes of these trees. In other words, having completed the project, they hold the knowledge. They have the expertise.

Further evidence of the acquisition of environmental identity through meaningful participation was displayed during the installation of the rain barrels. While most students planted trees, three students led a facilitator to assess the best placement of the barrels. This was more difficult than originally thought because the building that most contributed to the flooding lacked gutters and downspouts. As a result, students scoured the campus for other options. The young students discovered that, among their paltry options, the cafeteria was best. It had downspouts that could drain into the rain barrels and could be easily accessed to fill buckets to water the saplings and other campus flora, while reducing flooding outside the cafeteria. Students also noted that it would not be wise to place the rain barrels too close to the entrance of the cafeteria or gym (which was also an option), where other students might knock them over (when empty). Again, this type of

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<sup>3</sup>This is not a statement based on traditional gender bias but is based on our experience with the students in our group up to that point. Many of the girls expressed reluctance prior to planting the trees because of concerns such as getting their sneakers dirty. In a way, the girls’ reluctance and Cuifi’s statement could be construed as a self-fulfilling prophecy of societal gender bias. That is, the girls are socialized to stray away from “getting dirty.” They express those sentiments to us and we note this as a way to convey the success of this day’s activities.

awareness conveys the autonomy students felt they had in decision making, while also hinting at the ownership they were taking of the process.

After all of the trees were planted, two of the last three sessions of the semester involved painting and installing the rain barrels. We had no experience with rain barrel installation, and we were unsure of the time and level of expertise needed. Thus, installation preparation had to occur ahead of time, as there would be no time for students and facilitators to problem-solve together.<sup>4</sup> Nonetheless, students were still able to participate in most of the installation and painting the rain barrels (with low-VOC paint, of course!). Painting the barrels with their own artistic representations and names was a fun activity and added another level of participation and ownership.

On painting day, there were many students eagerly participating. This activity also attracted much outside interest and many other students came over to inquire about what we were doing and asked to participate. Interestingly, the Imagination Enviro-station students jumped at the opportunity to share their expertise with the newcomers. Additionally, two local newspaper reporters were present, which gave students more opportunity to display their competence. This day was thought by many of us to be one of the most successful due to student enthusiasm and the knowledge they displayed to their peers and the reporters.

#### *End-of-Project Surveys*

Brief surveys during the installation of the rain barrels served as another evaluative component of the project. With a combination of open and closed-ended questions, the surveys helped to measure our project's validity. Most important, we sought to determine the extent to which we had developed our tripartite conception of sustainability, with its environmental, pedagogical, and practical dimensions. Although only about half the students (eight) were present for the survey, they gave us an idea of the impact of the project.

Results showed that most of the students discussed the project with friends, family members, and their peers. Five of the eight respondents said they would be interested in participating in an environmental club in junior high school while the other three students chose, "I don't know," in response to that question. Five students also believed their campus looked "a lot better," and three thought it looked "a little better." Another question sought interest in "green jobs" and five

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<sup>4</sup>In fact, we secured the assistance of a professional craftsperson that was able to cut and re-attach the downspout to fit the rain barrels.



responded positively. Six indicated that the trees would help the school by providing shade on the playground and that the rain barrels were beneficial in that collected rain water could be used for the trees and other plants. What is somewhat surprising is that no students mentioned the reduction of flood waters due to the planting of the trees. This was a topic mentioned often throughout the project, and it was expected that they would mention it, especially because they educated their peers and the media in this way. A possible cause for this may have been that the surveys were conducted openly around other students during final rain barrel installation. Perhaps they were distracted by the installation process and simply repeated something similar to their classmates.

Overall, the surveys provided limited insight into the achievement of the environmental, pedagogical, and practical goals of the project due to the few students surveyed, the restriction on time, and the fact that they were not conducted in isolation. However, at the very least, the surveys showed that most were taking pride in, and a sense of ownership over, the project and their new sense of expertise. This is reflected by the fact that students were talking about the project with significant others, and that it had affected their thoughts about the future. Additionally, if a goal of this type of project is to achieve as much democratic participation as possible, future discussion should include the appropriateness of such a survey. Perhaps observation is sufficient to acquire this information.

## CONCLUSION

During a focus group session, a student was asked what his favorite thing to do in his backyard was and he replied, "I don't know. I don't have one." While his statement was not typical of this mostly rural area where many children, despite income, have at least some amount of outdoor space, it does exemplify the importance of allowing youth to engage with the natural world. In our project, students were given the opportunity to gain new knowledge while displaying self-efficacy through bettering their school community, while also obtaining the psychosocial benefits of interacting with the natural world.

With this CBR project, and through the facilitation of an ecologically-grounded identity (Clayton and Opotow 2003; Thomashow 2002), we hoped the young students would gain new information, skills, and approaches to solving problems in ecologically-sustainable ways (and in turn, provide benefits to their communities). We believed this was especially important considering that these students, mostly low-income and nonwhite, were more likely than their better-off, white peers to live in environmentally sub-par areas. If they could solve their own

problems while enhancing the natural vitality of their community, then structural oppression and inequality could be mitigated and resisted proactively. This proactive environmental agency could then serve as an alternative or addition to traditional reactionary activism.

Furthermore, this proactivity was integral to the interdependent elements of the project. Solving their own problems required that the students learn new skills, but in a way that considered the long-term health of the community. Thus, acquiring some ecological knowledge was necessary. For those involved, identity was positively affected. As Clayton (2003:50) stated in her research on the benefits of developing an environmental identity, three components seem to be “desired parts of everyone’s identity: autonomy, or self-direction; relatedness, or connection; and competence” (see also Ryan and Deci 2000). We believe, based on our observational data, that this project did help to enhance students’ identity in these areas, as it did ours.

Acting as decision makers and implementing the project themselves provided autonomy. Relatedness developed as our group of elementary-aged students, university students, and faculty worked together. Additionally, the work helped us all to see how we fit into the “larger picture, as part of an environment...a functioning ecosystem” (Clayton 2003:51). A not so insignificant element of this sense of connection is that students planted small flags, on which they had written their names, near the trees they had planted. This built on their identification with the trees and a connection to the natural world. Planting those flags also built on their identification with the group. As for competence, these feelings arose as students combined their own knowledge with their newly acquired comprehension of environmental sustainability. This competence grew as they applied that knowledge. It is noteworthy that the desire for competence has been important in motivating environmentally-sustainable behavior (Clayton 2003; De Young 2000). Consequently, by employing CBR principles we made a space for students, as well as ourselves, to develop an ecological identity. After all, we benefitted similarly to that outlined above.<sup>5</sup>

Although there was no systematic assessment of the graduate students’ experiences, there were some practical learning outcomes. We engaged in and learned from a real world CBR project with all of its unpredictable advantages and limitations. We also learned about ecological remediation, gained organizational

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<sup>5</sup>Although there was no systematic assessment of the impact of the project on the graduate students, Natalie Shelton (2011), a co-author here made such an assessment in her M.S. thesis.

skills, and acquired experience in fundraising. Additionally, we gained insight about the intersection among the constructs of ecological identity, community development, and social change. In fact, along with the youth, we took ownership of the process. By the semester's end, even those of us who, at the beginning of the semester, only held little interest in this type of endeavor had taken great pride in the project and what we had accomplished as a community with the youth. We had cultivated our own ecological identity.

While the limitations of our project constrained our assessment, future CBR-related projects should assess the impact on elementary and graduate students more accurately. Accurate measurements of the benefits of a CBR-oriented environmental sustainability project among youth can lead to the allocation of more extensive projects.<sup>6</sup> However, we believe the youth benefitted greatly from this project, and that it is part of an exponentially-growing number of projects that link environmental and social justice with environmental sustainability to create communities that are healthier, as well as more just, empowered, and self-determined.

Urban neighborhood tree-planting and maintenance projects (Austin and Kaplan 2003), communal gardening in domestic violence shelters (Stuart 2005), and school-based programs that employ adolescents and elementary students as primary actors in the creation and/or management of local public lands, wildlife sanctuaries, and wildlife exhibits (Thomashow 2002) are just a few other examples of the growing wave of innovative, community-oriented, economic and environmental initiatives. Additionally, the emergence of "food justice" within what is commonly called the food movement also exemplifies the grassroots desire to create more socially, economically, and ecologically healthy communities (Gottlieb and Joshi 2011).

In a way, our endeavor was part of this larger collective, and we came to see it that way as we looked to some of these other projects to develop our own. Although the following statement is about the power of food production, it parallels the self-efficacy embodied in our project, for both the young students and ourselves. So, perhaps Malik Yakini, an activist in Detroit's urban agriculture renaissance and chair of the Detroit Black Food Security Network, put it best when he said that

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<sup>6</sup>An example of a more accurate measurement of outcomes might be pre- and post-interviews of all participants (elementary and graduate students as well as participating faculty) to assess the growth of ecological identity and sense of self-efficacy. This could lead to more projects among youth, graduate students, and other community partners, who all become beneficiaries of these types of projects.

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there is a sense of “despair and helplessness” among the poor and poor African Americans that is “a direct result of oppression. Producing even some of our own food restores a sense of power, a sense that we can shape our own destiny” (Philpott 2010).



**FIGURE 1. CLUB MEMBERS PLANT A CYPRESS TREE IN THE FLOODED AREA TO HELP MITIGATE FLOODING OF THE PLAYGROUND.**





**FIGURE 2.** THE IMAGINATION ENVIRO-STATION GROUP: UNIVERSITY STUDENTS, FACULTY, AND SOME OF THE ELEMENTARY STUDENT MEMBERS.

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